Volume II - Environmental Impact Assessment Report

Proposed Residential Development

Lands West of Old Belgard Road and North, South & West of Cookstown Road, Cookstown Industrial Estate, Tallaght, Dublin 24

Joseph Costello, Absolute Limousines Ltd and Boherkill Property Development Ltd

February 2021

Hughes Planning & Development Consultants

70 Pearse Street, Dublin 2

+353 (0)1 539 0710 – info@hpdc.ie – www.hpdc.ie

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Background

The Applicants, Joseph Costello, Absolute Limousines Ltd and Boherkill Property Development Ltd, has acquired the subject land (Lands West of Old Belgard Road and North, South & West of Cookstown Road, Cookstown Industrial Estate) with the intention of securing the optimum land use on these underutilised sites within the Cookstown Industrial Estate. The Cookstown Industrial Estate is an area identified for 'regeneration' in the South Dublin County Development Plan 2016-2022 and is expected to be the subject of extensive urban renewal in the coming years.

A 4-11 storey mixed-use development, comprising 1,104 no. Build-to-Rent' residential apartments, 4 no. commercial units, 1500sqm of office space and a creche, has been identified as the preferred development option for the subject site having regard to the employment opportunities existing in the surrounding area, including the Tallaght University Hospital, TU Dublin (Tallaght Campus) and Amazon, and the sites proximity to multiple public transport services, the Tallaght Town Centre and a public open space area proposed immediately south-east under the Tallaght Town Centre Local Area Plan 2020-2026.

The design of the subject proposal has evolved during the planning process in response to the feedback received at S247 pre-planning consultations with South Dublin County Council and SHD pre-planning consultations with An Bord Pleanala; the policies and objectives outlined in the Tallaght Town Centre Local Area Plan 2020-2026 and South Dublin County Development Plan 2016-2022; and the input of the Environmental Impact Assessment team.

1.2 Purpose of this Report

Hughes Planning and Development Consultants have been commissioned by Joseph Costello, Absolute Limousines Ltd and Boherkill Property Development Ltd (referred to as the Applicants throughout), to prepare an Environmental Impact Assessment Report for a strategic housing development application for the proposed development of a residential scheme at lands West of Old Belgard Road and North, South & West of Cookstown Road, Cookstown Industrial Estate, Tallaght, Dublin 24.

A full description of the proposed development lands together with a description of the proposed development is provided in Chapter 2.0 of this document. In summary, the proposed development comprises demolition of the existing industrial units on site (save for the for the existing Circle K forecourt) and the construction of featuring 1104 no. 'build-to-rent' apartments with ancillary resident facilities, 4 no. commercial units (totalling 762sqm), 1,500sqm of office space and a 245sqm crèche, in 4 no. blocks varying in height from four to eleven storeys; road, junction and streetscape upgrade works along First Avenue, Cookstown Road and Old Belgard Road, including the installation a signalized junction at the intersection of First Avenue and Cookstown Road and Old Belgard Road and Cookstown Road; construction of 3 no. new roads and 1 no. pedestrian/cycle link to the Belgard Luas Stop; and construction of a public plaza in the south-western corner of the site.

The purpose of an Environmental Impact Assessment Report is to assess the likely and significant impact on the environment of the proposed development in parallel with the project design process. The potential impacts will be dependent on the nature, size and location of the proposed development.

This Environmental Impact Assessment Report has been prepared in accordance with the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (published in August 2018) and the 2017 Draft EIA Guidelines, published by the EPA in August 2017, as well as previously issued Irish and European EIA Guidelines and Guidance Documents.

We would also note that in preparing the subject Strategic Housing Development application and EIAR, the applicant and design/EIAR team have undertaken extensive pre-planning consultation with South Dublin County Council and An Bord Pleanala. The feedback received from South Dublin County Council and An Bord Pleanala significantly influenced the design and layout of the proposed development, in addition to informing the EIAR. The feedback received during these consultations and the subsequent amendments made to the scheme in response are detailed in Section 2.4.4 of the EIAR as well as in

Section 3.0 of the Statement of Consistency & Planning Report, prepared by Hughes Planning and Development Consultants, which accompanies this application. The evolution the proposed development underwent during this consultation process has resulted in a high quality, high density low carbon, highly accessible modern urban residential neighbourhood specifically connected to high capacity high quality public transport infrastructure.

1.3 EIA Legislation

Environmental Impact Assessment requirements are governed by Directive 2014/52/EU, which amends the previous EIA Directive (Directive 2011/92/EU). Article 2 of Directive 2014/52/EU provides that Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with the Directive by 16 May 2017. The European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 transposed the provisions of Directive 2014/52/EU into Irish law by amending the Planning and Development Act 2000, the Planning and Development (Housing) and Residential Tenancies Act 2016, the Planning and Development (Amendment) Act 2018 and the Planning and Development Regulations 2001.

The objective of the EU Directive (Directive 2011/92/EU), as amended by Directive 2014/52/EU, is to ensure a high level of protection of the environment and human health, through the establishment of minimum requirements for environmental impact assessment, prior to development consent being given, of public and private developments that are likely to have significant effects on the environment.

1.4 Definition of EIA and EIAR

EU Directive 2014/52/EU defines ‘environmental impact assessment’ (EIA) as:

> *‘a process consisting of:*
>
> *(a) the preparation of an Environmental Impact Assessment Report (EIAR) by the developer;*
> *(b) the carrying out of consultations;*
> *(c) the examination by the competent authority of the EIAR, any supplementary information provided, where necessary, by the developer and relevant information received through consultations with the public, prescribed bodies and any affected Member States*
> *(d) the reasoned conclusion of the competent authority on the significant effects of the project on the environment, and*
> *(e) the integration of the competent authority’s reasoned conclusion into any development consent decision.’*

The definition of EIA provides for a clear distinction between the process of environmental impact assessment to be carried out by the competent authority (in this instance An Bord Pleanála) and the preparation by the developer of an Environmental Impact Assessment Report (EIAR).

The European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, defines an EIAR as:

> *‘A report of the effects, if any, which proposed development, if carried out, would have on the environment and shall include the information specified in Annex IV of the Environmental Impact Assessment Directive.’*

Pursuant to Article 5(1)(a) to (f) of the Directive, an EIAR is required to provide the following information:

(a) A description of the project comprising information on the site, design, size and any other relevant features of the project;
(b) A description of the likely significant effects of the project on the environment;
(c) A description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;

(d) *A description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;*
(e) *A non-technical summary of the information referred to in points (a) to (d); and*
(f) *Any additional information specified in Annex IV of the Directive/Schedule 6 to the 2001 Regulations, as amended, relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.*

As is required by Annex IV of the 2014 Directive, this EIAR addresses matters including proposed demolition works, risks to human health, major accidents/disasters, biodiversity, climate change and cumulative effects with other existing and/or approved projects.

The EPA Guidelines state that the main purpose of an EIAR *'is to identify, describe and present an assessment of the likely significant impacts of a project on the environment. This informs the CA's assessment process, its decision on whether to grant consent for a project and, if granting consent, what conditions to attach.'*

1.5 The Need for an Environmental Impact Assessment Report (Screening)

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

Annex I of the EIA Directive 85/337/EC requires as mandatory the preparation of an EIA for all development projects listed therein. Schedule 5 (Part 1) of the Planning & Development Regulations 2001 (as amended) transposes Annex 1 of the EIA Directive directly into Irish land use planning legislation. The Directive prescribes mandatory thresholds in respect to Annex I projects.

Annex II of the EIA Directive provides EU Member States discretion in determining the need for an EIA on a case-by-case basis for certain classes of project having regard to the overriding consideration that projects likely to have significant effects on the environment should be subject to EIA. Schedule 5 (Part 2) of the Planning and Development Regulations 2001 (as amended) the regulations, sets the following mandatory thresholds for EIA preparation for each of the Annex II projects under Class 10:

a) *Industrial estate development projects, where the area would exceed 15 hectares.*

b) (i) ***Construction of more than 500 dwelling units.***

(ii) Construction of a car-park providing more than 400 spaces, other than a car-park provided as part of, and incidental to the primary purpose of, a development.

(iii) Construction of a shopping centre with a gross floor space exceeding 10,000 square metres.

(iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.

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

The subject development is not of a type or size that would require mandatory EIA under Annex I.

The subject development is not of a type or size that would require mandatory EIA under Annex I. However, given the number of units proposed, the subject proposal would constitute an "infrastructure project" with respect to Class 10 Annex II and accordingly an EIA is required under Class 10(b)(i).

1.6 The Scope of the Environmental Impact Assessment Report (Scoping)

'Scoping' is a process of deciding what information should be contained in an EIAR and what methods should be used to gather and assess that information. It is defined in the EC guidance (Guidance on EIA Scoping, EC, 2001) as:

> *'determining the content and extent of the matters which should be covered in the environmental information to be submitted in the EIAR'.*

A scoping exercise to identify the issues that are likely to be most important during the EIA process was carried out by the applicant, design team and EIAR consultants and informed the format of this EIAR.

The scoping of the EIAR has also taken into consideration the proposed development with specific reference to the surrounding environment, adjoining properties and any third-party concerns, the existing planning history and ensuring amenity impacts are reduced, removed or where applicable, mitigated to an appropriate level. The feedback received at S247 consultation meetings with South Dublin County Council and the SHD pre-application consultation with An Bord Pleanala has also informed the scope of the EIAR. The EIAR prepared for the scheme has endeavoured to be as thorough as possible.

In this context the following topics/issues have been reviewed and addressed in the context of the proposed development:

- Project Description and Alternatives Examined;
- Planning and Development Context;
- Population and Health;
- Biodiversity;
- Land, Soils and Geology;
- Water and Hydrology;
- Noise and Vibration;
- Air Quality and Climate;
- Material Assets;
- Archaeological, Architectural and Cultural Heritage;
- Landscape and Visual Amenity;
- Wind and Microclimate;
- Interaction between Environmental Factors;
- Principle Mitigation and Monitoring Measures; and
- Non-Technical Summary.

In addition to the above a series of standalone reports have been prepared to accompany the planning application and which have helped inform the above chapters of the EIAR where relevant.

1.7 Competency and EIAR Project Team

It is a requirement that the EIAR must be prepared by competent experts. The amended EIA Directive (Directive 2014/52/EU) states the following in relation to the persons responsible for preparing the environmental impact assessment reports:

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

For the preparation of this EIAR, the Applicant engaged Hughes Planning and Development Consultants to direct and coordinate the preparation of the EIAR and a team of qualified specialists were engaged to prepare individual chapters.

In order to outline compliance with this requirement of the amended directive and in line with emerging best practice the EIAR states the names of the environmental consultants who have prepared each element of the EIAR and lists their qualifications and relevant experience; demonstrating that the EIAR has been prepared by competent experts.

The consultant firms and their inputs are set out in Table 1.1 below. Details of competency, qualifications and experience of the lead author of each chapter and contributors to the applicable are outlined in the table below.

Organisation	Lead Consultant	Topics/Inputs
Hughes Planning and Development Consultants 70 Pearse Street, Dublin 2. T: 01 539 0711 E: info@hpdc.ie or margaret.commane@hpdc.ie	Mr Kevin Hughes - Director, Hughes Planning and Development Consultants – BA in in Sociology and MA in Regional and Urban Planning Ms. Margaret Commane – Associate, Hughes Planning and Development Consultants – BA in Geography and Legal Science and MA in Planning and Sustainable Development	• Introduction and Methodology; • Project Description and Alternatives Examined; • Population and Health • Interactions of the Foregoing; • Principle Mitigation and Monitoring Measures; and • Non-Technical Summary.
Altemar Environmental Consultants Lower Windgates, Rathdown Lower, Greystones, Co. Wicklow. T: 01 201 0713 E: bryan@altemar.ie	Mr. Bryan Deegan - Director, Altemar Environmental Consultants - MSc in Environmental Science, BSc (Hons.) in Applied Marine Biology, NCEA National Diploma in Applied Aquatic Science and a NCEA National Certificate in Science (Aquaculture)	• Biodiversity
GDCL Consulting Engineers Scope House, Whitehall Rd W, Perrystown, Co. Dublin T: 01 563 8342 E: greg@gdalyconsulting.com	Mr. Greg Daly - Director, GDCL Consulting Engineers – BSc in Engineering and MBA	• Land, Soils and Geology; • Water and Hydrology; and • Material Assets – Water Supply & Drainage
Courtney Deery Heritage Consultancy Ltd., Lynwood House, Ballinteer Road, Dublin 16. T: 01 5475795 E: yolande@courtneydeery.ie	Dr. Yolande O' Brien - Archaeological Planning Consultant, Courtney Deery Heritage Consultancy Ltd – MA in Landscape Archaeology (National University of Ireland, Galway) and a BA in Archaeology and Classical Civilisation	• Archaeology, Architectural and Cultural Heritage
Cunnane Stratton Reynolds 3 Molesworth Place, Dublin 2 T: 01 661 0419 E: eoldroyd@csrlandplan.ie	Ms. Emma Oldroyd – Senior Project Landscape Architect, Cunnane Stratton Reynolds - BA Hons, PG Diploma, MA in Landscape Architecture	• Landscape and Visual Impact
AWN Consulting Ltd The Tecpro Building, Clonshaugh Business & Technology Park, Dublin 17	Ms. Ciara Nolan - Environmental Consultant, AWN Consulting Ltd - MSc. in Environmental Science	• Air Quality and Climate

T: 01 847 4220 E: Ciara.Nolan@awnconsulting.com & Donal.Heavey@awnconsulting.com	and BSc. in Energy Systems Engineering.	
	Mr. Donal Heavey - Acoustic Technician at AWN Consulting Ltd – B.Eng in Video and Sound Technology and Dip. in Acoustics	• Noise and Vibration
NRB Consulting Engineers Ltd 1st Floor, Apollo Building, Dundrum Rd, Dundrum, Dublin 14 T: 01 292 1941 E: eoin.reynolds@nrb.ie	Mr. Eoin Reynolds – Director, NRB Consulting Engineers Ltd – BE in Civil Engineering	• Material Assets – Traffic/Transportation/Roads
B-Fluid Ltd 18 Herbert Street, Dublin 2 T: 01 506 5671 E: cristina.paduano@b-fluid.com	Dr. Cristina Paduano – Director, B-Fluid Ltd - PhD in Mechanical Engineering, M.Eng and B.Eng in Aerospace Engineering.	• Wind and Microclimate

Table 1.1 EIAR Specialist Consultant

1.8 Structure of Environmental Impact Assessment Report

The EIAR is sub divided into 3 no. volumes as follows:

- Volume I - Non-Technical Summary;
- Volume II - Environmental Impact Assessment Report; and
- Volume III - Appendices to Environmental Impact Assessment Report.

Volume II is presented as 15 no. chapters as outlined in the Table 1.2 below.

Chapter	Chapter Title	Chapter Description
1	Introduction and Methodology	Sets out the purpose, methodology and scope of the document.
2	Project Description and Alternatives Examined	Sets out the description of the site, design and scale of development, considers all relevant phases from construction through to existence and operation together with a description and evaluation of the reasonable alternatives studied by the developer including alternative locations, designs and processes considered; and a justification for the option chosen taking into account the effects of the project on the environment.
3	Planning and Development Context	Describes the site context, the planning history of the subject site and the surrounding site and the local, regional and national policies that the proposed development will be assessed against.
4	Population and Health	Describes the demographic and socio-economic profile of the receiving environment and potential impact of the proposed development on population, i.e. human beings, and human health.
5	Biodiversity	Describes the existing ecology on site and in the surrounding catchment, and assesses the potential impact of the proposed development and mitigation measures incorporated into the design of the scheme.
6	Land, Soils and Geology	Provides an overview of the baseline position, the potential impact of the proposed development on the site's soil and geology and impacts in relation to land take and recommends mitigation measures.

7	Water and Hydrology	Provides an overview of the baseline position, the potential impact of the proposed development on water quality and quantity and recommends mitigation measures.
8	Noise and Vibration	Provides an overview of the baseline noise environment, the potential impact of the proposed development and recommends mitigation measures.
9	Air Quality and Climate	Provides an overview of the baseline air quality and climatic environment, the potential impact of the proposed development, the vulnerability of the project to climate change, and recommends mitigation measures.
10	Material Assets	Describes the existing traffic, waste management and services and infrastructural requirements of the proposed development and the likely impact of the proposed development on material assets.
11	Archaeological, Architectural and Cultural Heritage	Provides an assessment of the site, and considers the potential impact of the proposed development on the local archaeology, architectural and cultural heritage; and recommends mitigation measures.
12	Landscape and Visual Impact	Provides an overview of the baseline position, the potential impact of the proposed development on the landscape appearance and character and visual environment, and recommends mitigation measures.
13	Wind and Microclimate	This chapter assesses the baseline conditions currently existing on site and in its immediate surrounds and likely impacts on the wind microclimate of the completed buildings and open spaces.
14	Interactions between Environmental Factors	Describes the potential interactions and interrelationships between the various environmental factors discussed in the above chapters.
15	Principle Mitigation and Monitoring Measures	Sets out the key mitigation and monitoring measures included in the EIAR document for ease of reference.

Table 1.2 EIAR Chapter Outline

Each chapter of this EIAR assesses the direct, indirect, cumulative and residual impact of the proposed development for both the construction and operational stage of the proposed development.

In preparing the EIAR the following regulations and guidelines were considered:

- The requirements of applicable EU Directives and implementing Irish Regulations regarding Environmental Impact Assessment;
- 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 (Environmental Protection Agency, August 2017).
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018).

In addition, specialist disciplines have had regard to other relevant guidelines, and where relevant these are noted in individual chapters of the EIAR.

1.9 Cumulative Projects

A no. of large developments have been approved in the Cookstown Industrial Estate since the introduction of the Strategic Housing Development application process. A detailed discussion on the Strategic Housing Developments approved within the Cookstown Industrial Estate is included in Section 4.3 of the Statement of Consistency & Planning Report and Section 5.4 of the Statement of Material Contravention, both prepared by Hughes Planning and Development Consultants, which accompany this application.

However, these recent approvals do not immediately abut the subject site (the closest one at Units 66 and 67 Fourth Avenue being 0.5km from the subject site at its closest point). Given the spatial separation between the subject proposal and the approved Strategic Housing Developments in the wider Cookstown Industrial Estate, they are not considered sufficiently proximate to warrant consideration of their potential cumulative effects.

1.10 Consultation

In preparing the subject Strategic Housing Development application and EIAR, the applicant and design/EIAR team have undertaken extensive pre-planning consultation with South Dublin County Council and An Bord Pleanala. Guidance received during these consultations was integrated into the design and in turn is assessed in this EIAR. The feedback received during these consultations and the subsequent amendments made to the scheme in response are detailed in Section 2.4.4 of the EIAR as well as in Section 3.0 of the Statement of Consistency & Planning Report, prepared by Hughes Planning and Development Consultants, which accompanies this application.

Further to the above, the Notice of Pre-Application Consultation Opinion, issued by An Bord Pleanála (under ABP. Ref ABP-30402-20), detailed specific information required for inclusion with any subsequent application for permission, pursuant to article 285(5)(b) of the Planning and Development (Strategic Housing Development) Regulations 2017. The Statement of Response to Pre-application Consultation Opinion, prepared by Hughes Planning and Development Consultants, which accompanies this application outlines how this aspect of the Board’s Notice of Pre-Application Consultation Opinion has been satisfied.

Where relevant specialists engaged with prescribed bodies and the details of advice received is provided in the individual chapters of this EIAR. The Notice of Pre-Application Consultation Opinion received from An Bord Pleanála following the pre-application consultation meeting contained details of the prescribed bodies to be notified of the making of this application. We can confirm that the following prescribed bodies have received a copy of the application including the EIAR:

- Irish Water;
- Transport Infrastructure Ireland;
- National Transport Authority;
- Irish Aviation Authority;
- Department of Defence; and
- South Dublin County Childcare Committee.

Additionally, prior to lodging this application, the required information has been issued to the Department of Housing, Planning and Local Government’s EIA Portal. The purpose of this tool is to inform the public, in a timely manner, of applications that are accompanied by an EIAR. The portal provides a URL link to a dedicated website for this proposed development and a copy of the EIAR is available on this website. The website address is as follows: www.cookstowncastleshd.com. This website is publicly accessible and will allow members of the public to review the application material and EIAR.

Subsequent consultation with the public on the application and accompanying EIAR will be facilitated following the lodgement of the application to An Bord Pleanala. Pursuant to the requirements of the Planning and Development Act, 2000 (as amended), site notices have been erected on site and a newspaper notice has been published in the Irish Daily Mail. Both the site and newspaper notices erected/published advise members of the public that a Strategic Housing Development application accompanied by an EIAR has been lodged with An Bord Pleanala and provides details on how that can make an observation on the same should they see fit. Details of the website address feature on the site notices erected on site and the newspaper notice published as well as on An Bord Pleanala’s website.

1.11 Statement of Difficulties Encountered

No exceptional difficulties were experienced in compiling the necessary information for the proposed development. Where any specific difficulties were encountered these are outlined in the relevant chapter of the EIAR.

2.0 DESCRIPTION OF PROPSED DEVELOPMENT AND ALTERNATIVES CONSIDERED

2.1 Introduction

This section of the EIAR has been prepared by Hughes Planning and Development Consultants, in conjunction with C+W O'Brien Architects. More specifically, this chapter of the EIAR was prepared jointly by Mr. Kevin Hughes, Director, and Ms. Margaret Commane, Associate, with Hughes Planning and Development Consultants.

Mr. Kevin Hughes of Hughes Planning and Development Consultants, graduated from University College Dublin (UCD) with a Masters in Regional and Urban Planning (MRUP) in 2002, having previously completed a Bachelor of Arts Degree in Sociology from National University of Ireland in 1999. Kevin has over 18 years professional experience in the field of planning and development consultancy, which has included providing consultancy services in respect of several major urban regeneration projects including EIA. Kevin is currently the Director of Hughes Planning and Development Consultants.

Ms. Margaret Commane of Hughes Planning and Development Consultants, graduated from University College Cork (UCC) with a Masters in Planning and Sustainable Development (MPLAN) in 2012, having previously completed a Bachelor of Arts Degree in Geography and Legal Science from National University of Ireland in 2010. Margaret has over 7 years professional experience in the field of planning and development consultancy, which has included providing consultancy services in respect of several major urban regeneration projects including EIA. Margaret is currently an Associate in the Practice of Hughes Planning and Development Consultants.

This chapter provides a detailed description of the project together with details of the existing environment as well as explaining the evolution of the scheme design through the reasonable alternatives examined. In accordance with Article 5(1)(a) of the 2011 Directive, as amended by Directive 2014/52/EU, the description of the proposal should comprise *"…information on the site, design, size and other relevant features of the project*".

2.2 Site Location and Context

The subject application involves a large parcel of land located to the west of Old Belgard Road and east of the intersection of First Avenue and Cookstown Road, Cookstown Industrial Estate, Tallaght, Dublin 24. The subject site comprises an area of approximately 4.99Ha (12.3 acres). It includes a no. of existing industrial/commercial premises fronting Cookstown Road, Old Belgard Road and First Avenue; the Circle K Belgard petrol station and associated commercial premises; 0.98Ha of South Dublin County Council owned land; and 0.19 Ha of Dublin City Council owned land (consent letters from South Dublin County Council and Dublin City Council accompany this application under a separate cover). The South Dublin County Council owned land comprises parts of First Avenue, Cookstown Road and Old Belgard Road and the Dublin City Council owned land comprises a strip to the north of Unit 5 First Avenue and Unit 4 Cookstown Road which provides access to the Belgard Luas Stop.

There are existing low-rise (1-3 storeys) industrial/commercial buildings (which have a total floor area of 15,988sqm) featuring on the subject land. These, inclusive of the commercial premises associated with the existing Circle K Belgard petrol station, are proposed for demolition as part of the subject proposal. The Circle K Belgard petrol station and forecourt are to be retained and a new commercial premise serving it provided as part of the subject application.

The site is located within an area comprising industrial land use immediately east, west, south and north (in part). The western part of the subject site's northern boundary is flanked by an access road and open space area featuring 110kV power lines. Further north, is the Red Luas line and Katherine Tynan Road. A strong feature of the subject site is its proximity to the Belgard Luas stop, which is located immediately north-east of the application site, offering a high frequency, high capacity public transport service with direct links to Dublin City Centre, Dublin Docklands, Heuston Station, Citywest Campus and Tallaght Hospital. It is also noted that the site is in close proximity to Bus Routes No. 76 and 76A which run along Belgard Road. Tallaght Hospital is situated to the south-west of the subject site and Technological University Dublin, Tallaght Campus is situated to the south-east of the subject site.

The area immediately surrounding the subject site is known as the Cookstown Industrial Estate and features industrial and commercial land uses. The Cookstown Industrial Estate is expected to be the subject of extensive urban renewal in the coming years, with existing industrial buildings being replaced with higher density development and multi-national corporations, such as Amazon, commencing operation in the area. Currently, the majority of the immediately surrounding buildings are older building stock, save for a recently constructed 4-storey office building featuring at the Old Belgard Road and Cookstown Road roundabout. However, a number of large scale residential and mixed-use developments have been approved in the surrounding area in recent times.

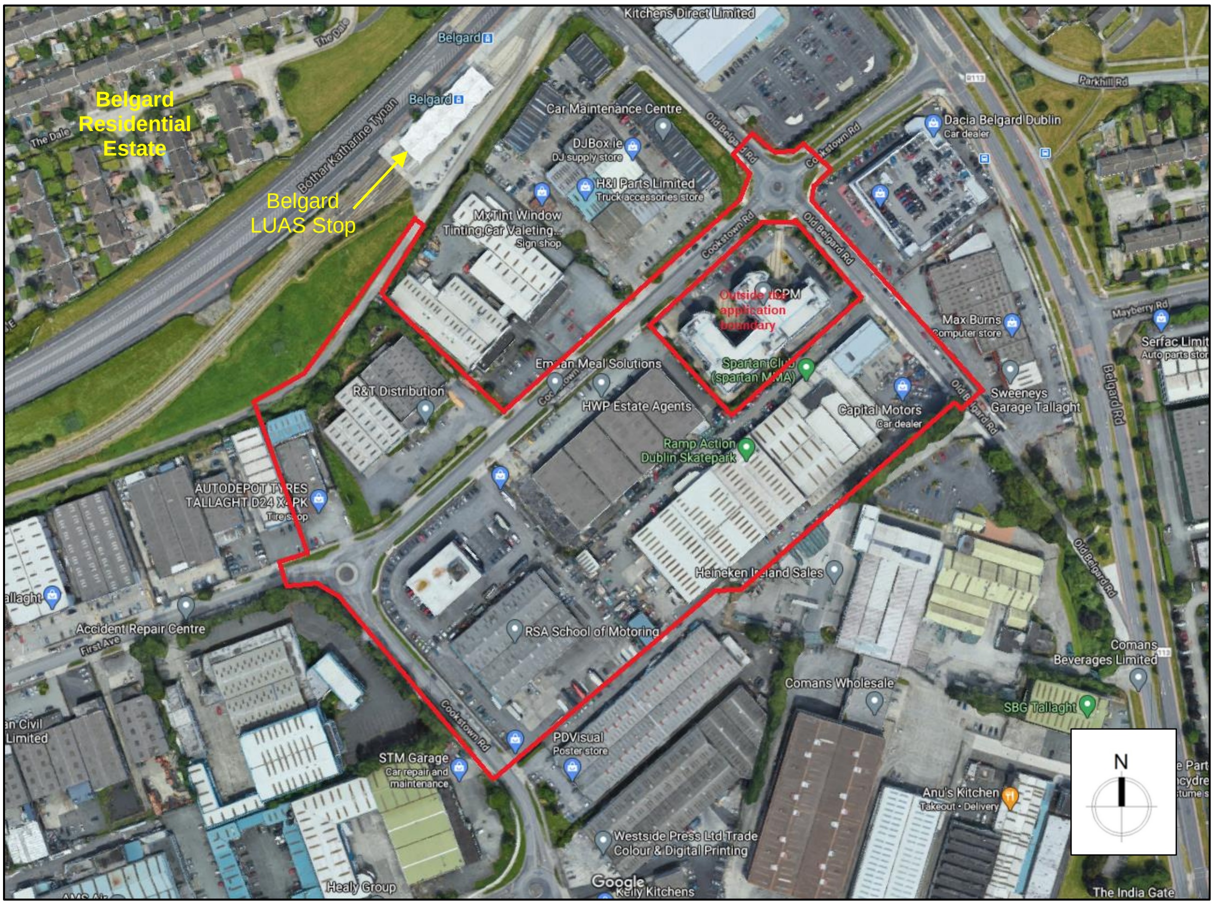


Figure 2.1 Aerial image showing the application site (outlined in red)

Figure 2.2 Existing view of the subject site as viewed from the intersection of Cookstown Road & First Avenue looking south-east (left) and Cookstown Road (north) looking south (right)

Figure 2.3 Existing view of subject site as viewed from Cookstown Road (west) looking east (left) and Old Belgard Road looking west (right)

Figure 2.4 Existing view of subject site as viewed from the intersection of First Avenue and Cookstown Road, looking north

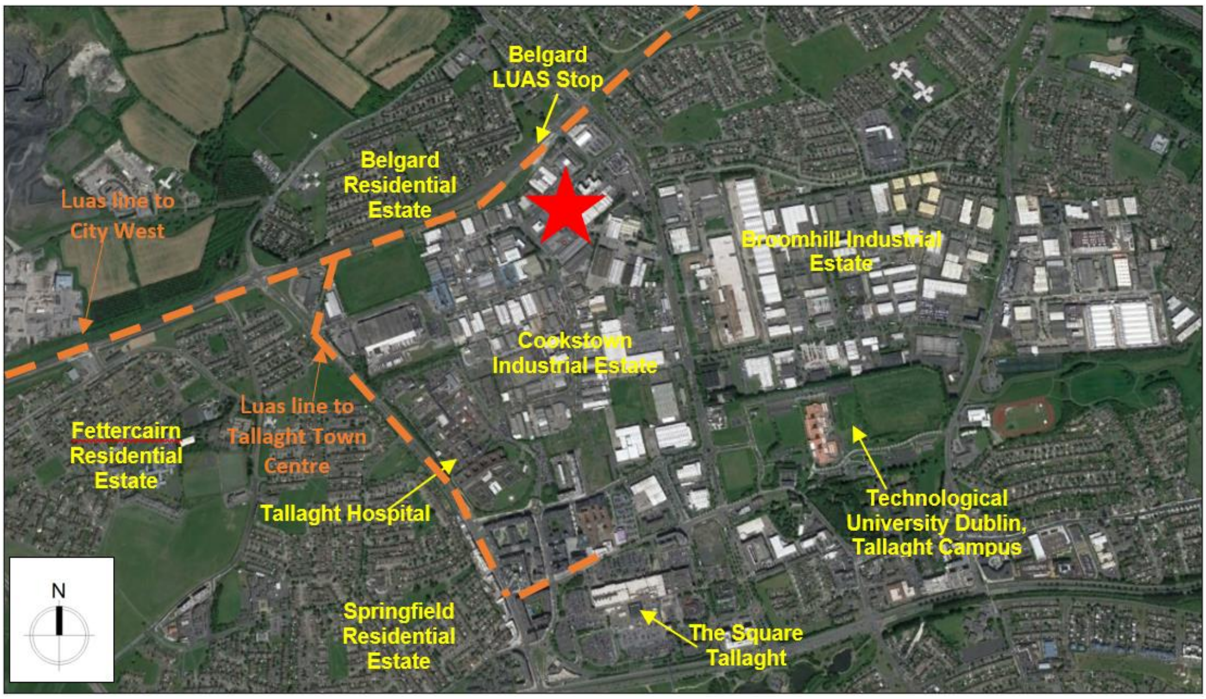


Figure 2.6 Aerial image showing the application site (indicated with red star) in the context of the wider area

Characteristics of the subject site which are of particular note to the various disciplines/specialists involved in preparation of the EIAR are outlined in the individual chapters.

2.3 Nature and Extent of Proposed Development

In summary, the Applicant is applying to An Bord Pleanála, under the Strategic Housing Development process, for the following (as per the public notices):

> *(i) Demolition of the existing industrial and commercial buildings (15,989sq.m); (ii) construction of a mixed-use development featuring: (a) 1104 no. 'build-to-rent' apartments (132 no. studio apartments, 475 no. 1-bed apartments, 208 no. 2-bed apartments, 244 no. 2-bed duplex units and 45 no. 3-bed apartments) in 4 no. blocks varying in height from four to eleven storeys. Each apartment has associated private open space in the form of a ground floor terrace or a balcony and has access to internal communal amenity spaces (totalling 2741sqm) and 5,107sqm of external communal amenity space at ground, first floor and roof levels; and (b) 4 no. commercial units at ground floor level of Blocks B and D (comprising of 2 no. in Block B accommodating a cafe/restaurant/bar; 1 no. in Block D accommodating Class 1, 2 and 8 uses as per the Planning and Development Regulations, 2001-2019, as amended; and 1 no. in Block D to serve the Circle K Belgard petrol station which is to be retained), 1,500sqm of office space across first to sixth floor levels of Block D and a crèche with external play area at ground floor level of Block C. The development is served by a total of 351 no. parking spaces (including 17 no. limited mobility parking spaces and 16 no. car share spaces) and 1860 no. bicycle spaces (1464 no. resident spaces and 396 no. visitor spaces); (iii) road, junction and streetscape upgrade works along First Avenue, Cookstown Road and Old Belgard Road, including the installation a signalised junction at the intersection of First Avenue and Cookstown Road and Old Belgard Road and Cookstown Road; (iv) construction of 3 no. new roads and 1 no. pedestrian/cycle link to the Belgard Luas Stop; (v) construction of a 1,688sqm landscaped public plaza with an outdoor flexible events space in the south-western corner of the site; and (vi) associated site and infrastructural works are also proposed which include: foul and surface water drainage; attenuation tanks; lighting; landscaping; boundary fences; plant areas; ESB substations; internal hard landscaping, including footpaths and street furniture; and all associated site development works'*

Figure 2.7 Site layout plan of proposed mixed-use development

Figure 2.8 Ground and first floor landscape masterplan for the proposed development

The layout of the proposed development has been informed by the topography of the subject site, its proximity to the Belgard Luas Stop, the feedback received from South Dublin County Council and An Bord Pleanala at pre-planning stage, the policies and objectives set out for the subject site and surrounding area in the Tallaght Town Centre Local Area Plan 2020-2026, as well as the inputs from the EIAR consultants.

2.3.1 Demolition

The proposal includes the demolition of the existing industrial units/buildings featuring on site (totalling 15,989sq.m).

Figure 2.9 Proposed demolition plan

2.3.2 Proposed Mixed-use Development

The development proposal will include the construction of a mixed-use development, featuring 1104 no. Build-to-Rent apartments (132 no. studios, 475 no. 1-bed apartments, 208 no. 2-bed apartments, 244 no. 2-bed duplex units and 45 no. 3-bed apartments), 4 no. commercial units (totalling 762sqm and comprising of 2 no. in Block B accommodating a cafe/restaurant/bar, 1 no. in Block D serving the existing Circle K Belgard petrol station which is being retained and 1 no. in Block D accommodating Class 1, 2 and 8 uses as per the Planning and Development Regulations, 2001-2019, as amended), 1,500sqm of office space and a 245sqm crèche in 4 no. blocks varying in height from four to eleven storeys (totalling 91,282sq.m). The proposed development retains the existing petrol station (associated with Circle K Belgard) located in the north-eastern corner of the subject site.

More specifically, the proposed 4 no. blocks can be described as follows:

Block A — Residential building (4 to 9 storeys, with podium level car park) located in the northern part of the site accommodating 36 no. studios, 79 no. 1-bed apartments, 62 no. 2-bed apartments, 75 no. 2-bed duplex apartments and 8 no. 3-bed apartments, with associated balconies / terraces for each apartment from ground floor to 8th floor levels. Block A features 492sqm of internal communal amenity space at ground and eighth floor levels and 1355sqm of external amenity space in the form of a 1078sqm landscaped courtyard at first floor level and 276sqm roof terrace at eighth floor level. Block A's podium level car park features 68 no. car parking spaces (4 no. of which are limited mobility user spaces) and 540 no. bicycle parking spaces.

Block B — Mixed-use building (7 to 11 storeys, with podium level car park) located in the south-western corner of the site accommodating 28 no. studios, 152 no. 1-bed apartments, 52 no. 2-bed apartments, 98 no. 2-bed duplex apartments and 12 no. 3-bed apartments, with associated balconies / terraces for each apartment from ground floor to tenth floor levels; and 2 no. commercial units (totaling 285sq.m) both accommodating a cafe/restaurant/bar. Block B features 916sqm of internal communal amenity space at ground and ninth floor levels and 1619sqm of external amenity space in the form of a 872sqm landscaped courtyard at first floor level, which features a 285sqm pavilion, and a 461sqm roof terrace at ninth floor level. Block B's podium level car features 53 no. car parking spaces and 336 no. bicycle parking spaces. Block B has been setback from the sites south-western corner to provide a 1688sqm public plaza.

Block C Residential building (7-9 storeys, with podium level car park) located centrally on the site accommodating 68 no. studios, 155 no. 1-bed apartments, 53 no. 2-bed apartments, 49 no. 2-bed duplex apartments and 25 no. 3-bed apartments, with associated balconies / terraces for each apartment from ground floor to eighth floor levels; and a 245sqm creche with 100sqm external play space. Block C features 1002sqm of internal communal amenity space at ground, eighth and ninth floor levels and 1746sqm of external amenity space in the form of a 456sqm landscaped courtyard at ground floor, a 724sqm landscaped courtyard at first floor level, a 288sqm roof terrace at seventh floor level and a 277sqm roof terrace at eighth floor level. Block C's podium level car park features 42 no. car parking spaces and 336 no. bicycle parking spaces.

Block D Mixed-use building (8 storeys) located in the south-eastern corner of the site fronting Old Belgard Road accommodating 89 no. 1-bed apartments, 41 no. 2-bed apartments and 22 no. 2-bed duplex apartments, with associated balconies / terraces for each apartment from ground floor to seventh floor levels; 2 no. commercial units (totaling 477sq.m), one of which will serve the existing Circle K Belgard petrol station which is to be retained and the other accommodating Class 1, 2 and 8 uses as per the Planning and Development Regulations, 2001-2019, as amended; and 1500sqm of office space across first to seventh floor level. Block B features 152sqm of internal communal amenity space at ground floor level and 609sqm of external amenity space in the form of a landscaped terrace first floor level. Block D's podium level car park features 30 no. car parking spaces and 252 no. bicycle parking spaces. An additional 21 no. car parking spaces are provided in the north-eastern corner of the block to serve the proposed commercial units and office space.

In addition to the external communal amenity spaces discussed above, the proposed development includes 6,680sqm of public open space. This is inclusive of a linear park around Block A, a linear park centrally at Block C which ties in with an interconnected linear park and public plaza featuring in Block B. The 1688sqm public plaza is provided in the south-western corner of the site immediately north of a new urban square proposed in the Tallaght Town Centre Local Area Plan 2020-2026.

In addition to the car and bicycle parking spaces discussed above, the development is served by an additional 130 no. car parking spaces (10 no. of which are limited mobility user spaces) and 396 no. visitor bicycle parking spaces scattered throughout the development.

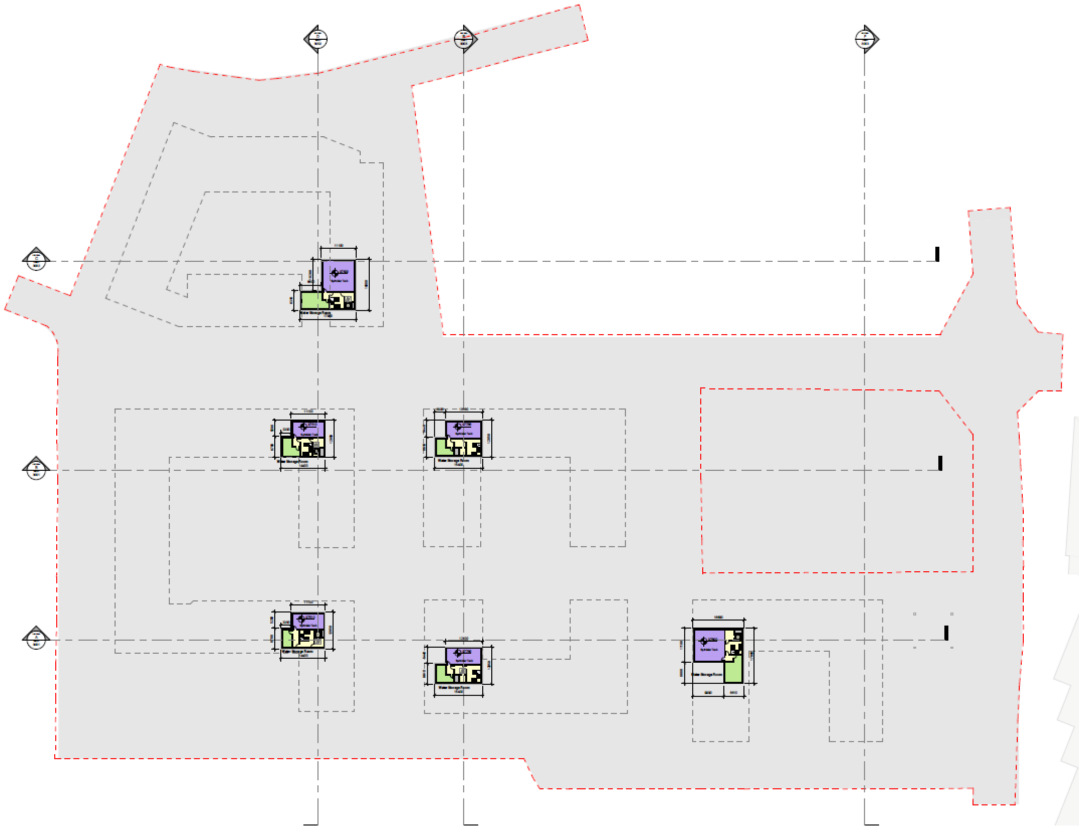


Figure 2.10 Basement plan of the proposed development (basements for services only)

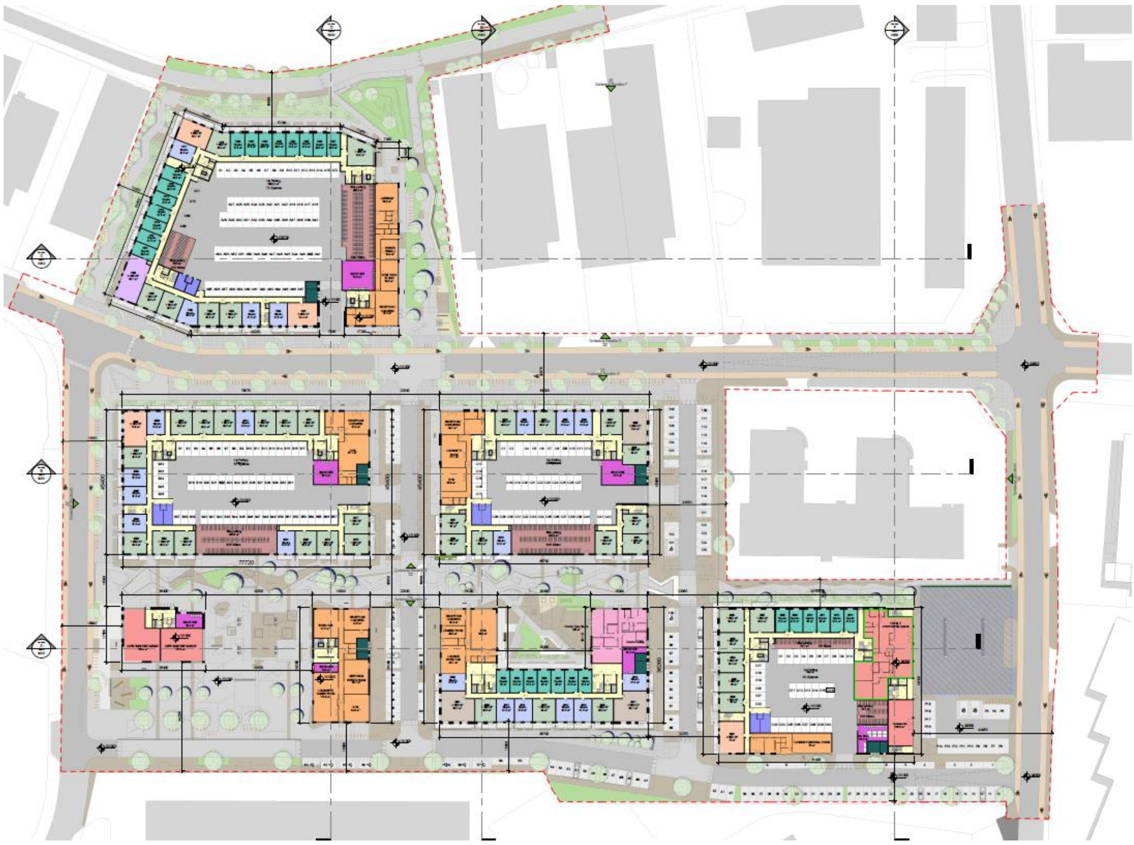


Figure 2.11 Ground floor plan of the proposed development

Figure 2.12 First floor plan of the proposed development

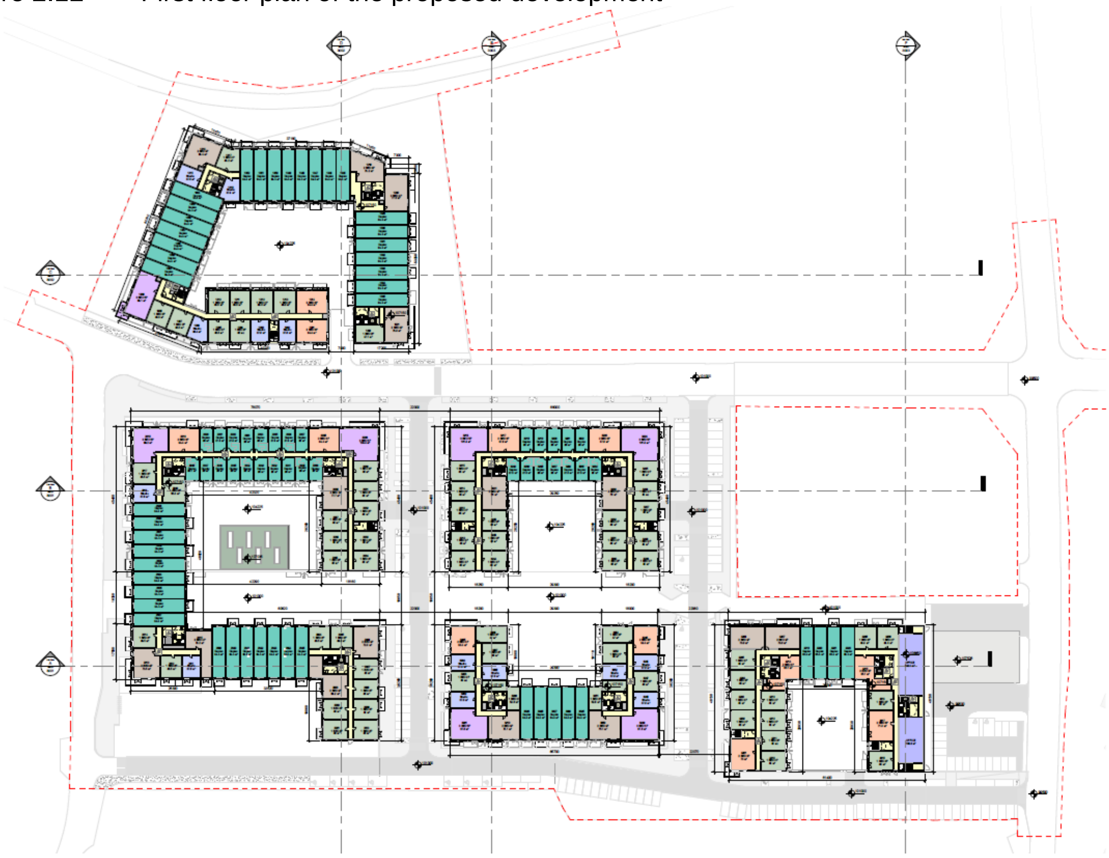


Figure 2.13 Second floor plan of the proposed development

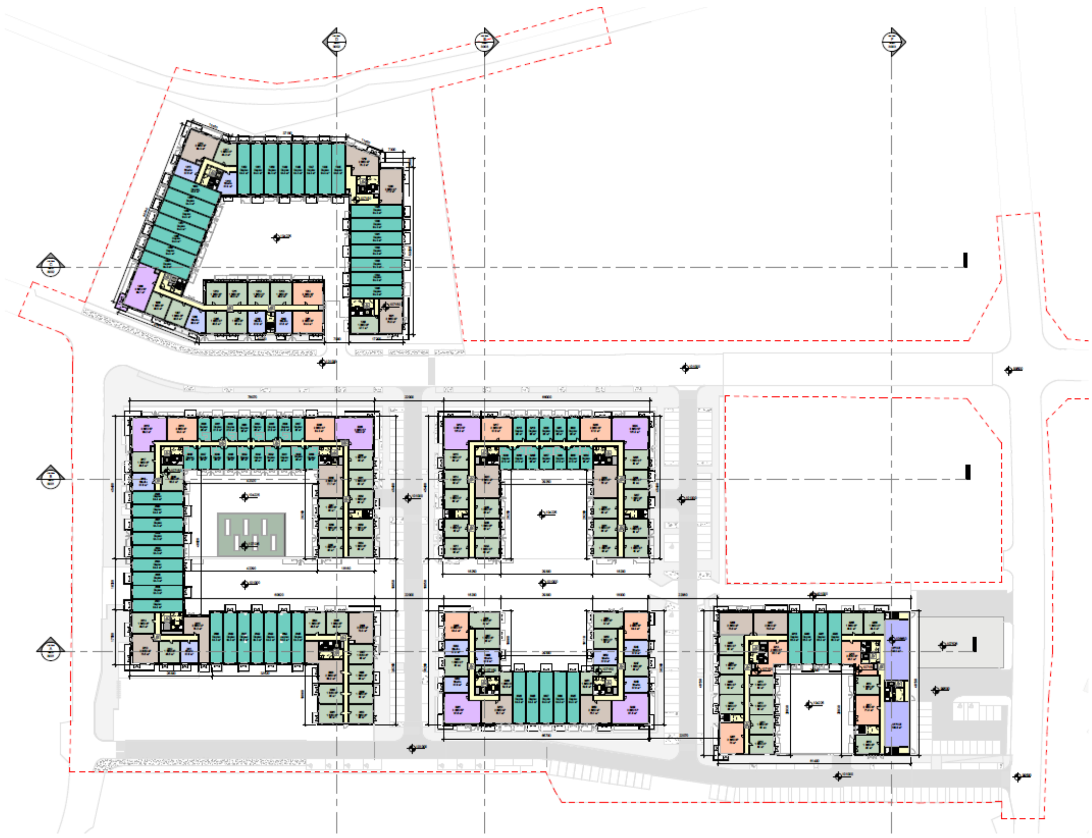


Figure 2.14 Third floor plan of the proposed development

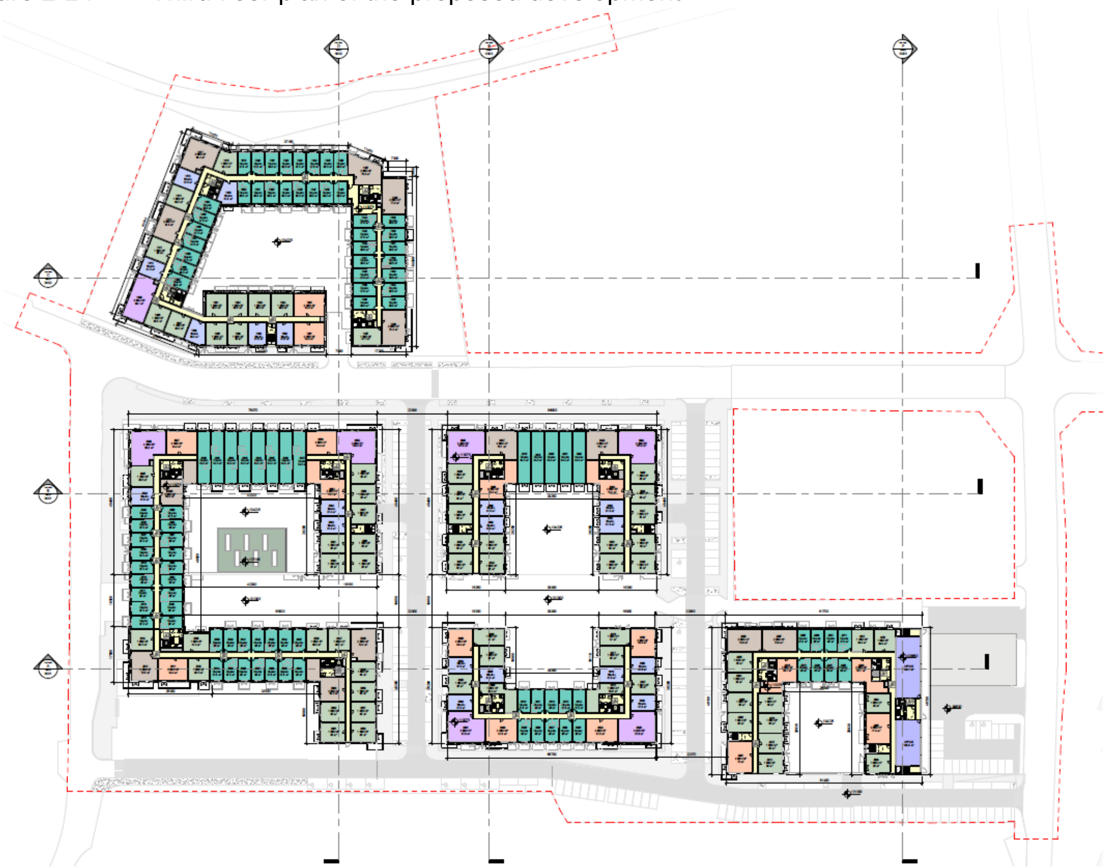


Figure 2.15 Fourth floor plan of the proposed development

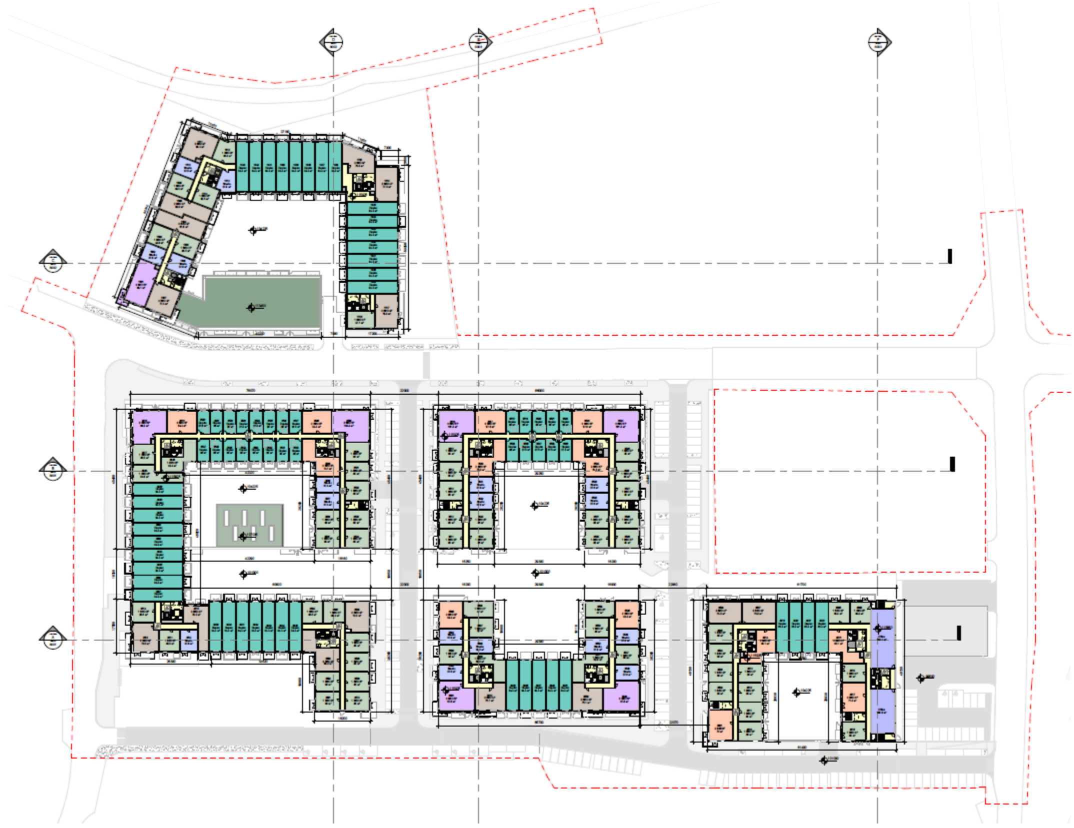


Figure 2.16 Fifth floor plan of the proposed development

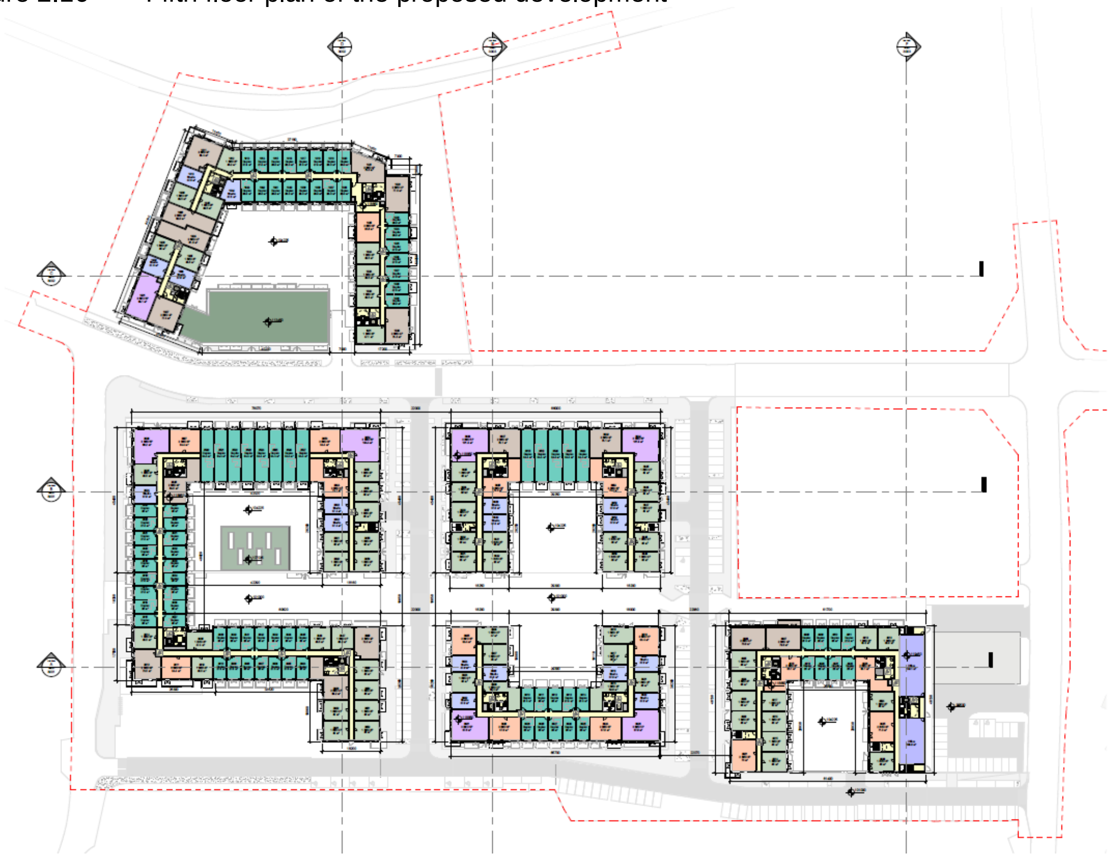


Figure 2.17 Sixth floor plan of the proposed development

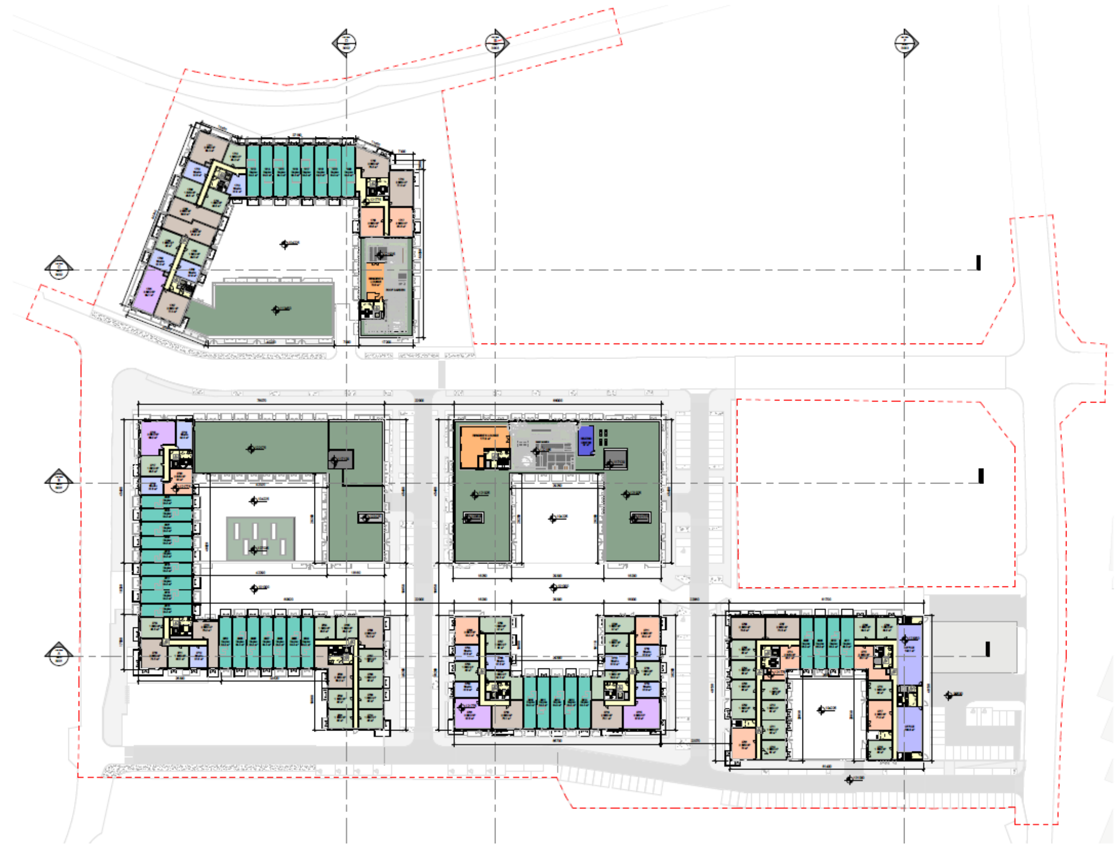


Figure 2.18 Seventh floor plan of the proposed development

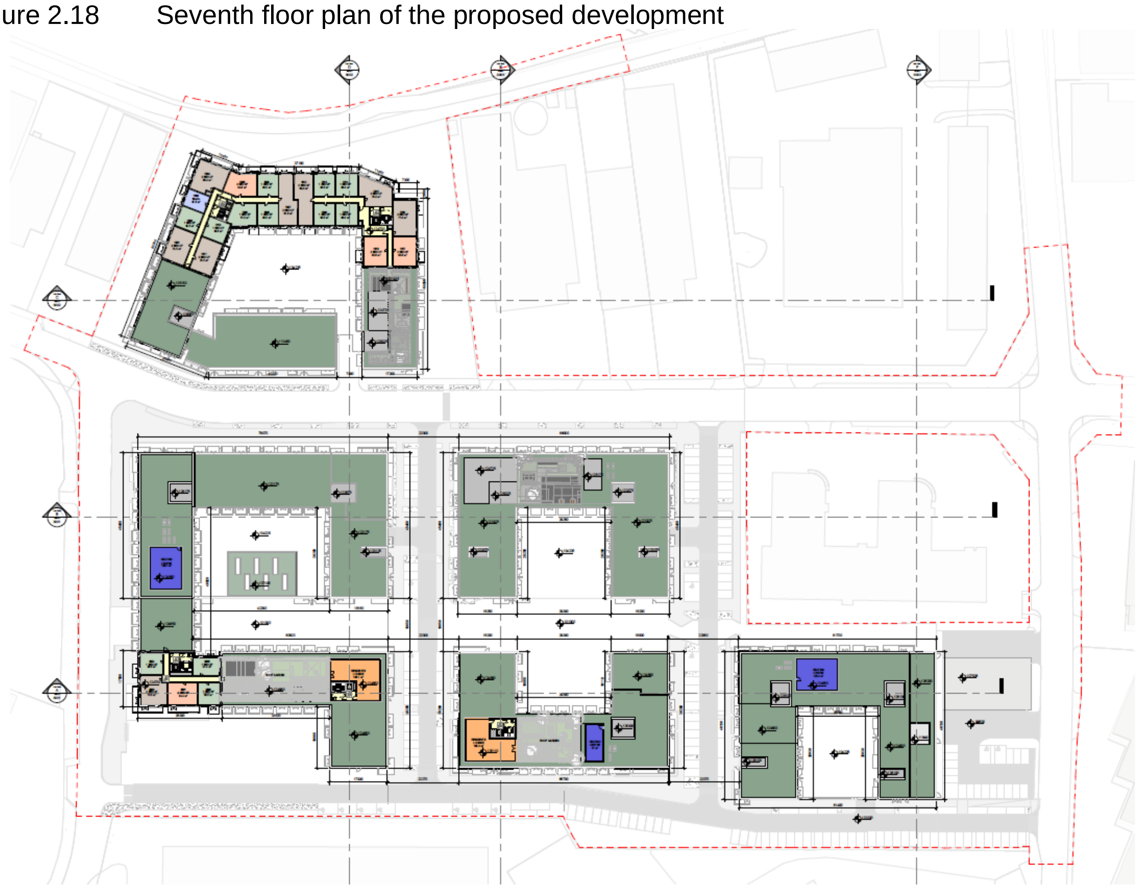


Figure 2.19 Eighth floor plan of the proposed development

Figure 2.20 Ninth floor plan of the proposed development

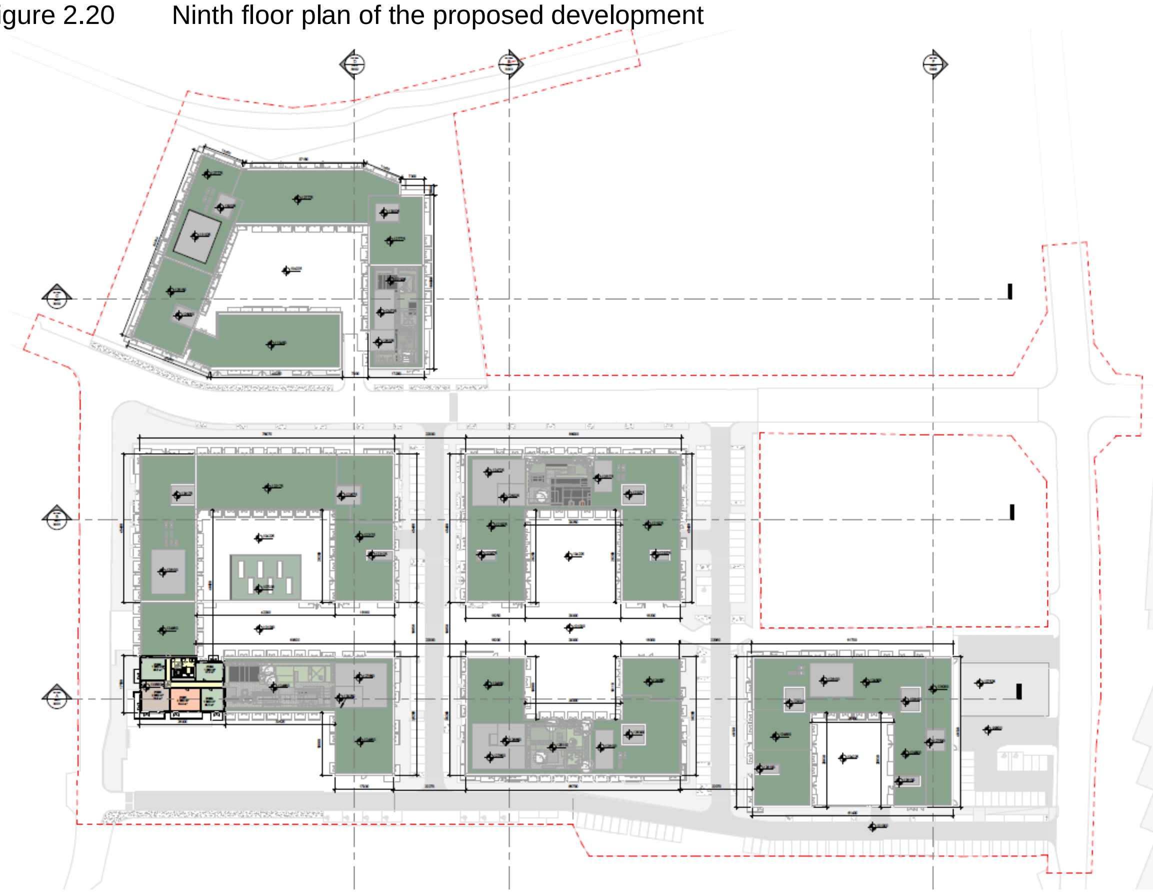


Figure 2.21 Tenth floor plan of the proposed development

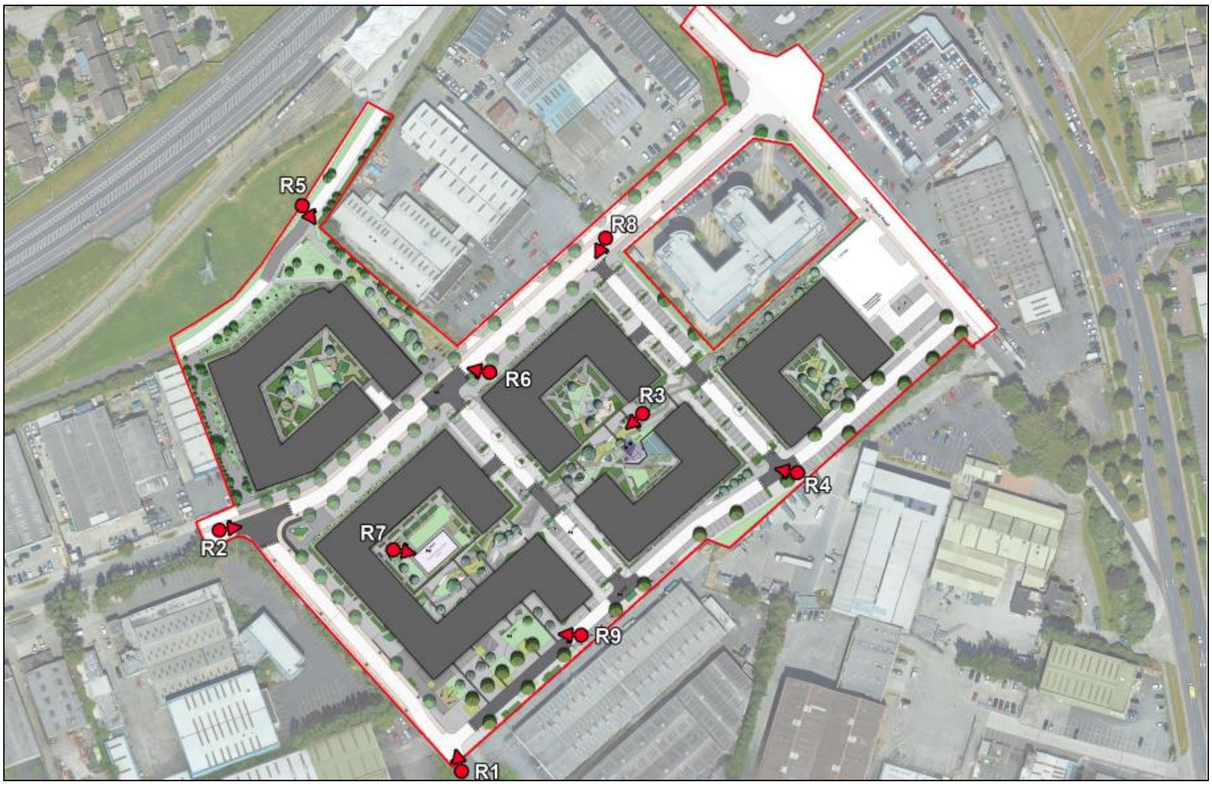


Figure 2.22 CGI position map

Figure 2.23 CGI R9 of the proposed development

Figure 2.24 CGI R6 of the proposed development

Figure 2.25 CGI R3 of the proposed development

Figure 2.26 CGI R5 of the proposed development

Figure 2.27 CGI R2 of the proposed development

Figure 2.28 CGI R1 of the proposed development

Figure 2.29 Ground and first floor landscape masterplan for the proposed development

Figure 2.30 Rooftop garden landscape details for the proposed development

Please also refer to the Design Statement and architectural drawing set, prepared by C+W O'Brien Architects, and the Landscape Strategy & Design Report and landscape drawing set, prepared by Cunnane Stratton Reynolds, for further information regarding the above.

2.3.3 Services and Proposed Infrastructure Works

Foul Sewer

The foul drainage system for the site has been designed having regard to the topography of the site. It is proposed to divide the foul sewer into two catchments.

There is an existing 300mm diameter foul sewer in running in an easterly direction along the footpath for Cookstown Road. Block A foul drainage will discharge to this foul sewer. There is an existing 450mm diameter foul sewer currently located within the existing access lane currently the south of the existing warehouse where proposed Blocks C & D will be located. Proposed flows for Blocks B, C and D will discharge to this sewer.

Please refer to Chapters 7 and 10 of this EIAR and Section 7.0 of the Engineering Services Report and associated engineering drawings, prepared by GDCL Consulting Engineers, for further information. It is worth noting that the design team have undertaken extensive consultation with Irish Water in relation to the proposed development.

Surface Water Drainage

Surface water throughout the site will collected by a green roof system with addition roof and podium slab gullies draining via downpipes and pipe slung to the underside of the ground floor slab before discharging into the attenuation facility allocated to each block.

Flows from the attenuation tanks will be throttled at greenfield runoff rates before discharging into the existing surface water network.

Please refer to Chapters 7 and 10 of this EIAR and Section 6.0 of the Infrastructure Design Report and associated engineering drawings, prepared by GDCL Consulting Engineers, for further information.

Water Supply

Block A will be serviced by a proposed 150mm diameter watermain which connects to the existing 150mm diameter watermain located in the Cookstown Road footpath.

Blocks B, C and D will be serviced by a proposed 150mm diameter ring watermain with individual connections to the existing 150mm diameter watermain located in the Cookstown Estate Road footpath, to the west of Block B.

These proposed watermains in turn will connect to a water booster and balancing system to be located in the two respective basements (where applicable) of the proposed development. This booster system will store and pump potable water to all apartments and commercial units within the development.

Please refer to Chapters 7 and 10 of this EIAR and Section 9.0 of the Infrastructure Design Report and associated engineering drawings, prepared by GDCL Consulting Engineers, for further information.

Road/Junction Upgrades

The proposed development includes proposals to construct a new road through the subject site, along the site's southern boundary, which links Cookstown Road with the Old Belgard Road, as well as 2 no. new roads through the subject site linking Cookstown Road with the newly created through road. These new roads will provide vehicular access to Blocks B, C and D. Access to the Block A will be provided via a vehicular access off Cookstown Road.

A new pedestrian link is proposed from Cookstown Road to the Belgard Luas Stop immediately north.

The proposed development also includes road, junction and streetscape upgrades along First Avenue, Cookstown Road and Old Belgard Road, including the installation a signalized junction at the intersection of First Avenue and Cookstown Road and the intersection of Old Belgard Road and Cookstown Road.

Figure 2.31 Excerpt from drawings, prepared by NRB Consulting Engineers, illustrate the road, junction and streetscape upgrade works proposed

Please refer to Chapter 10 of this EIAR and the Transportation Assessment Report (included at Appendix 10.1) and the drawings included at Appendix A of this report, prepared by NRB Consulting Engineers, for further information.

2.3.4 Phasing of Development

The proposed development will be constructed in 4 no. phases (A, B, C & D) commencing with Phase A immediately adjacent to the Luas line and ending with Phase D abutting the petrol station on the Old Belgard Road. The diagram included in Figure 2.32 below indicates the phasing of the proposed development.

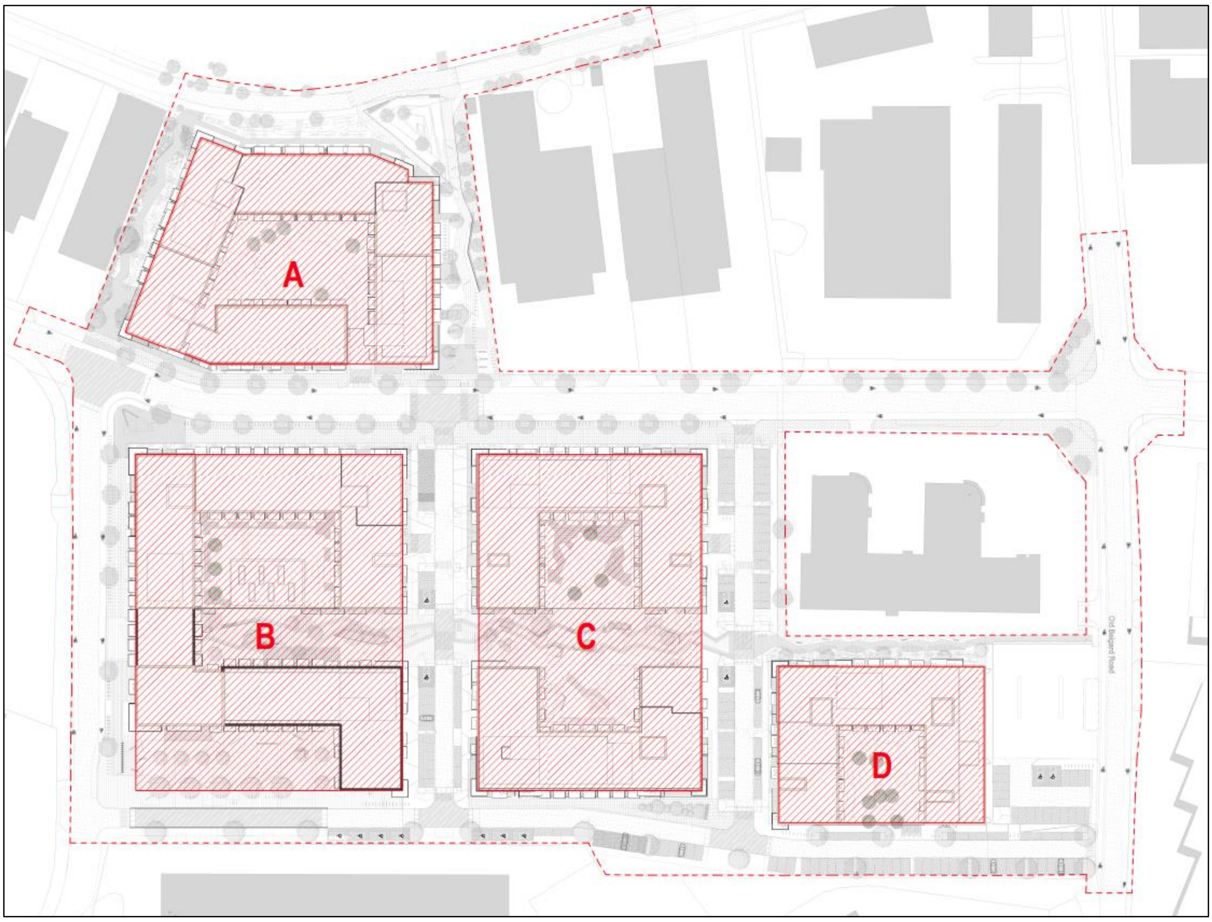


Figure 2.32 Proposed phasing of the proposed mixed-use development.

2.4 Alternatives Examined

The EIA Directive (2014/52/EU) requires that Environmental Impact Assessment Reports include *'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.'*

The European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 describe alternatives as follows:-

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

Reasonable alternatives may include project design proposals, location, size and scale, which are relevant to the proposed development and its specific characteristics. The Regulations require that an indication of the main reasons for selecting the preferred option, including a comparison of the environmental effects to be presented in the EIAR.

This chapter provides an outline of the main alternatives examined during the design phase. It sets out the main reasons for choosing the development as proposed, taking into account and providing a comparison on the environmental effects. For the purposes of the Regulations, alternatives may be described at three levels:

i. Alternative Locations
ii. Alternative Designs
iii. Alternative Processes

2.4.1 Alternative Locations

Given the zoning of the subject site in the South Dublin County Development Plan 2016-2022 and the objectives of the Tallaght Town Centre Local Area Plan 2020-2026, and having regard to the project's objectives, no reasonable alternative locations were considered. The rationale for the subject project is to provide a residential development with ancillary facilities and a mixed-use component in a sustainable modern urban neighbourhood landscaped setting on Regeneration Zoned lands in close proximity to Tallaght Town Centre. The proposal is predicated on the zoning applying to the site for residential development in the South Dublin County Development Plan 2016-2022 and the objectives of the Tallaght Town Centre Local Area Plan 2020-2026, whereby new residential development is envisaged. It is within this statutory planning policy context that all alternatives have been considered.

2.4.2 Alternative Uses

In addition to residential use, there are other land uses which are permitted in principle on these lands. It is not considered that an alternative comprising one of the alternative uses would result in the best use of these lands, particularly having regard to the general acknowledged need for housing and particularly the creation of a sustainable urban community neighbourhood, given the proximity of the subject site to the immediately adjacent high quality public transport infrastructure. Currently, the environs of the subject site are largely industrial/commercial in nature. However, the Cookstown Industrial Estate is expected to be the subject of extensive urban renewal in the coming years, with existing industrial buildings being replaced with higher density development in accordance with the Tallaght Town Centre Local Area Plan 2020-2026 and multi-national corporations, such as Amazon, commencing operation in the area.

In this context, the proposal now the subject of this application comprises appropriate land uses in accordance with the proper planning and sustainable development of the area.

2.4.3 Description of Alternative Processes

Given the zonings of the subject site, and the nature of the proposed development, no reasonable alternative processes were studied.

2.4.4 Alternative Designs/Layouts and Consultations on the Design Development

The design approach for the proposed development is presented in the Architectural Design Statement prepared by the project Architects, C+W O'Brien Architects, and it should be read in conjunction with this chapter of the EIAR.

Alternative site layouts and siting progressed throughout the design process in order to minimise the impact on the receiving environment at the earliest opportunity. The initial stage involved a constraints analysis of the land within the proposed development site to identify all high-level constraints and aggregate them against the site to allow a suitable layout to be developed.

The following analyses alternatives development options considered for the site, starting with the initial layout tabled at the 1st pre-planning meeting had with South Dublin County Council on 9th May 2019, and then describing design options and changes which were incorporated into the scheme as the proposals progressed through extensive pre-application discussions with South Dublin County Council and An Bord Pleanála and in response to input from the appointed EIAR team. The principal considerations and amendments to the design of the scheme, having regard to and comparing the key environmental issues, are set out and discussed.

Option 1 – Design/Layout discussed at the pre-planning consultations with South Dublin County Council in May 2019

The first design option explored by Tyler Owens Architects in early 2019 (illustrated in Figures 2.27-2.29 below and overleaf), which was subsequently tabled at a pre-planning meeting with South Dublin County Council on 9th May 2019, can be described as follows:

> *Demolition of existing low rise industrial units and construction of a 'build-to-rent' housing development, comprising 22 no. blocks, varying in height from three to twelve storeys, accommodating 1480 no. residential apartments (425 no. studios, 244 no. 1-bed, 246 no. 2-bed (3P) and 565 no. 2-bed (4P)). The development featured 579 no. car parking spaces at basement level across the site (497 no. spaces in the larger parcels and 82 no. spaces); 102 no. on-street carparking spaces; 787sq.m of bicycle storage space for residents provided across the site; a gym at ground floor level of Block 10 and a creche at ground floor level of Block 07. The ground floor level of the 22 no. blocks will feature residential, commercial, office, industrial/craft, restaurant/cafe and retail units as well as communal amenity rooms. It was also proposed to construct a new road through the subject site, which links the Cookstown Road/First Avenue Roundabout with the R838, as well as a new pedestrian link from Cookstown Road to the Belgard Luas Stop immediately north. More specifically, this new road and pedestrian link will occupy the western part of the smaller parcel of land making up the subject site.*

The layout had taller buildings than currently proposed, an increased no. of apartments and a different block configuration. The central open space areas serving the various blocks required greater consideration with regards to daylight/sunlight access. The road layout proposed for the development required greater consideration.

Figure 2.33 Indicative site layout of the proposed development tabled at first S247 meeting with South Dublin County Council in May 2019

Figure 2.34 3D drawing illustrating the massing of the proposed blocks across the site tabled at first S247 meeting with South Dublin County Council in May 2019

Figure 2.35 CGI of the proposed of the proposed development illustrating the varying building heights proposed across the site tabled at first S247 meeting with South Dublin County Council in May 2019

Option 2 – Design/Layout discussed at the pre-planning consultations with South Dublin County Council in July 2019

The second design option explored by Tyler Owens Architects in mid 2019 (illustrated in Figures 2.30-2.33 below and overleaf), which was subsequently tabled at a pre-planning meeting with South Dublin County Council on 11th July 2019, included the following key changes, in terms of design and access, from the Option 1 design previously discussed:

- Omission of the previously proposed link road to the R838;
- Introduction of an additional north-south link road centrally on the site (previously pedestrian/cycle only connection proposed);
- A reconsidered open space strategy for the development, including the addition of a large public open space area to the north of the development;
- Blocks in the southern portion of the site have been reconfigured and re-orientated to provide a better frontage to the proposed Through Road and also to improve daylight and sunlight penetration to central areas of the development.
- Entrances to basement carparking areas were incorporated into the proposed buildings.
- Variation were introduced in relation to the BTR units proposed i.e. blocks have been broken down into family blocks, young professional blocks, temporary resident blocks (for travelling professional) etc.
- A pedestrian link has been created in the northern section of the site to the nearby Luas Stop.
- A phasing plan for development was included with the revised proposal.

The revisions were prepared in consultation with Cunnane Stratton Reynolds and NRB Consulting Engineers, and were considered to provide an appropriate solution in respect to overall/roads layout and permeability within the scheme.

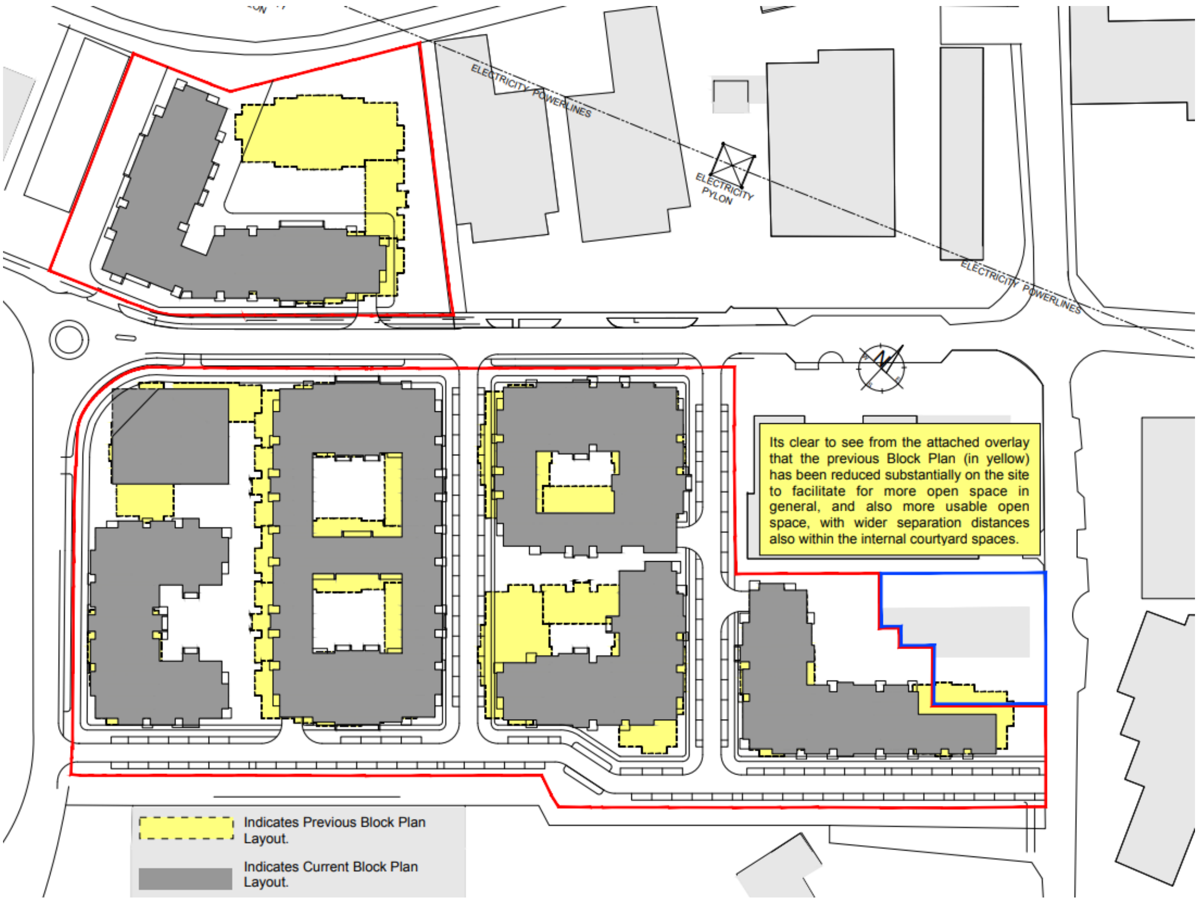


Figure 2.36 Indicative site layout of the proposed development tabled at second S247 meeting with South Dublin County Council in July 2019

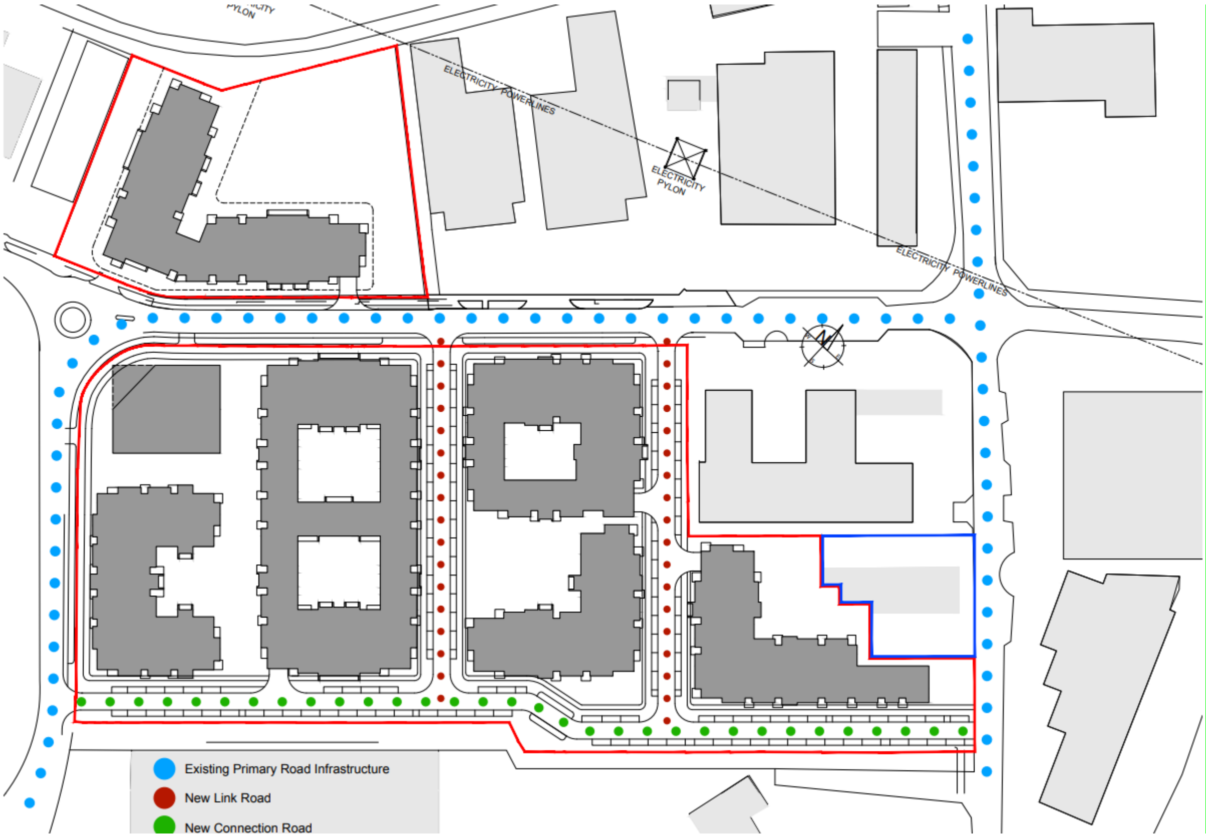


Figure 2.37 Roads layout and hierarchy plan for the proposed development tabled at second S247 meeting with South Dublin County Council in July 2019

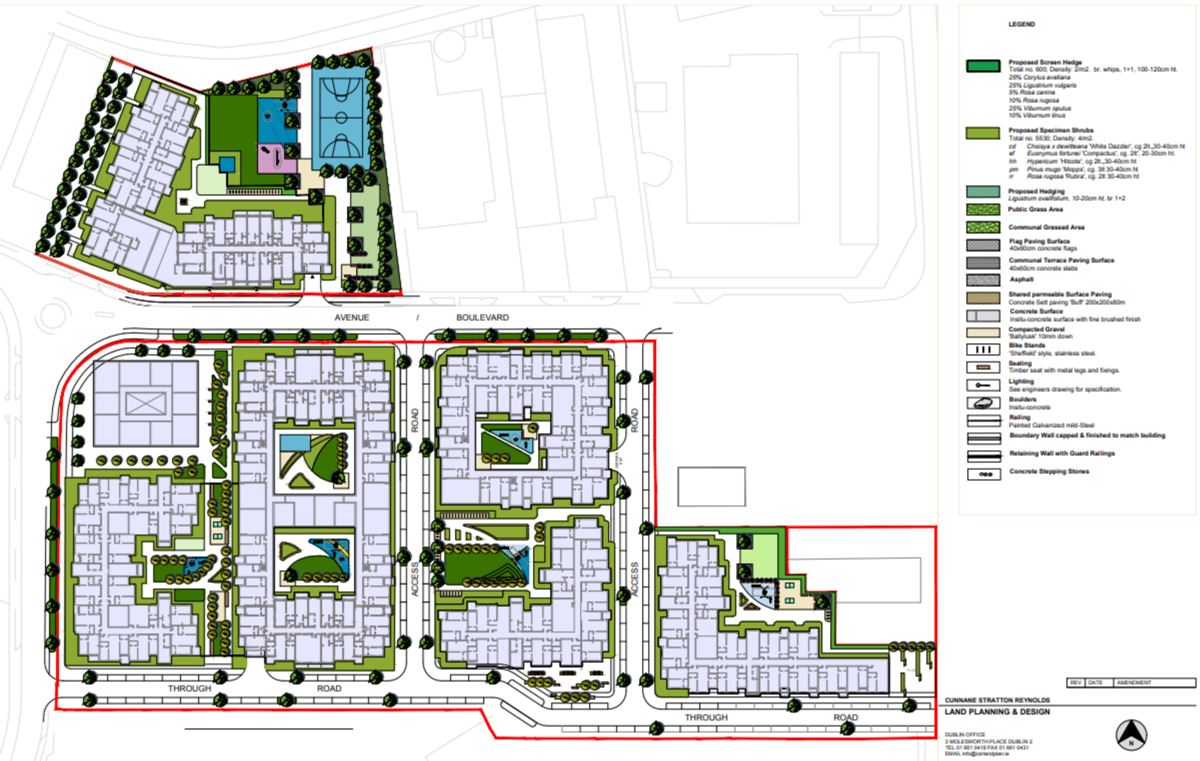


Figure 2.38 Private and public open space strategy for the proposed development tabled at second S247 meeting with South Dublin County Council in July 2019

Figure 2.39 Phasing plan for the proposed development tabled at second S247 meeting with South Dublin County Council in July 2019

Option 3 – Design/Layout discussed at the S247 Pre-planning Meeting with South Dublin County Council in October 2019

The third design option was explored by C+W O'Brien Architects following the second pre-planning meeting with South Dublin County Council (illustrated in Figures 2.34-2.42 overleaf), which was subsequently tabled at the S247 Pre-planning Meeting with South Dublin County Council on 2nd October 2019, included the following key changes from the Option 2 design previously discussed:

- The development site was divided into 2 no. parts, a smaller northern parcel and a larger southern parcel, which were to be dealt with in 2 no. separate planning applications;
- Permeability through the site, both pedestrian and vehicular, had been improved;
- The amount of open space provided had been increased and the open space provided had been better designed for public and private use;
- The height and massing of the proposed development had been reduced which has had a resultant reduction in unit nos.;
- The level of activation and variance in height had been improved along the proposed developments southern interface; and
- The mix of unit types and ground floor uses had been improved.

The proposal put forward for the northern parcel involved the following:

> *Demolition of the existing industrial units and construction of an 8-12 storey 'build-to-rent' housing development providing a total of 284 no. residential apartments (comprising 40 no. studio units, 50 no. one-bed units, 79 no. two-bed units and 95 no. three-bed). The proposal also includes the creation of a new pedestrian link adjacent to the subject site's eastern boundary, linking Cookstown Road to the Belgard Luas Stop immediately north.*

Figure 2.40 Massing model for the proposed development on the northern parcel tabled at the S247 meeting with South Dublin County Council in October 2019

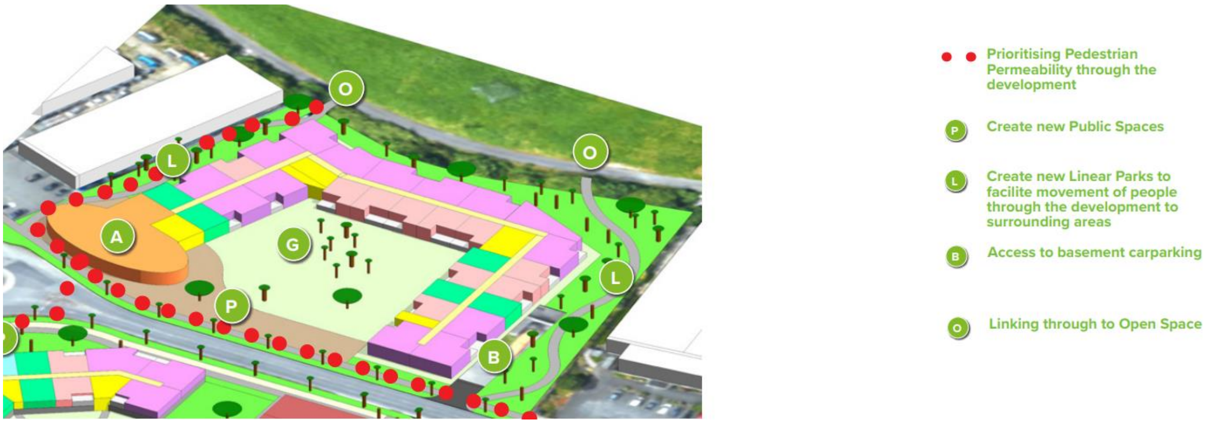


Figure 2.41 Site layout and connection plan for the proposed development on the northern parcel tabled at the S247 meeting with South Dublin County Council in October 2019

The proposal put forward for the southern parcel involved the following:

> *Demolition of the existing industrial units and construction of a 5-12 storey 'build-to-rent' housing development providing a total of 849 no. residential apartments (comprising 174 no. studio units, 245 no. one-bed units, 359 no. two-bed units, 56 no. three-bed units and 15 no. 4-bed units). The proposal also includes the creation of 3 no. new roads (one adjacent to the sites southern boundary and 2 no. north-south links centrally on the site.*

Figure 2.42 Massing/layout model for the proposed development on the southern parcel tabled at the pre-planning meeting with South Dublin County Council in October 2019

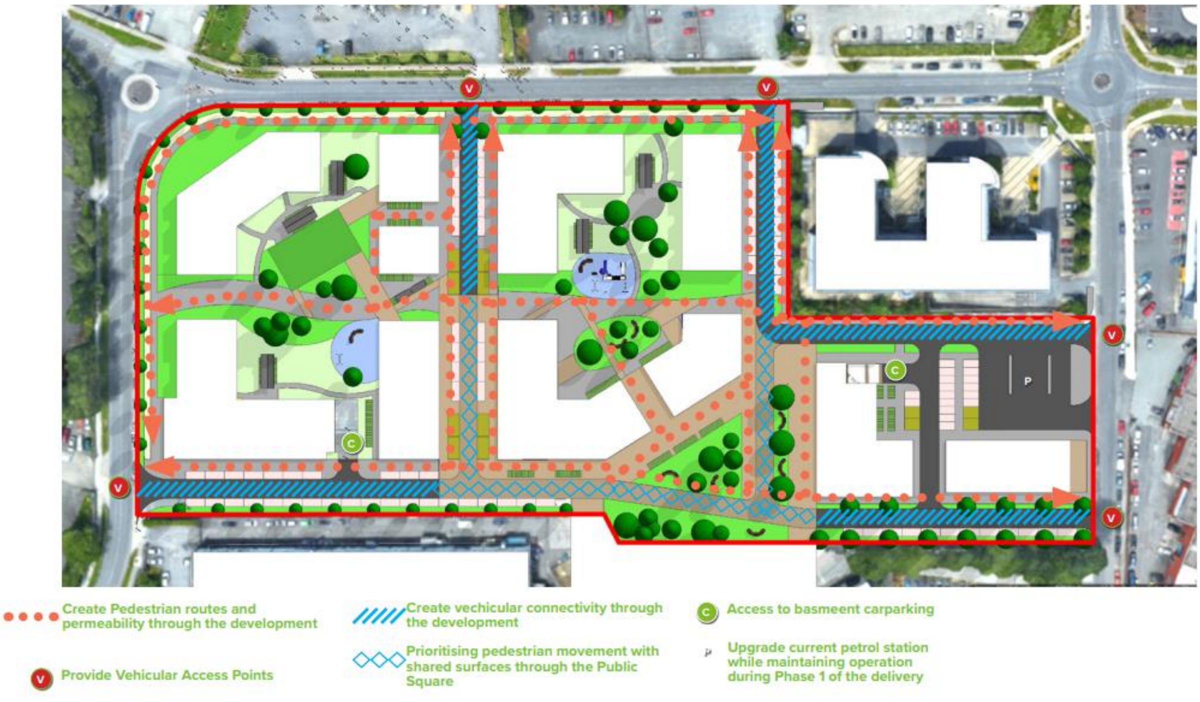


Figure 2.43 Site permeability and access diagram for the proposed development on the southern parcel tabled at the pre-planning meeting with South Dublin County Council in October 2019

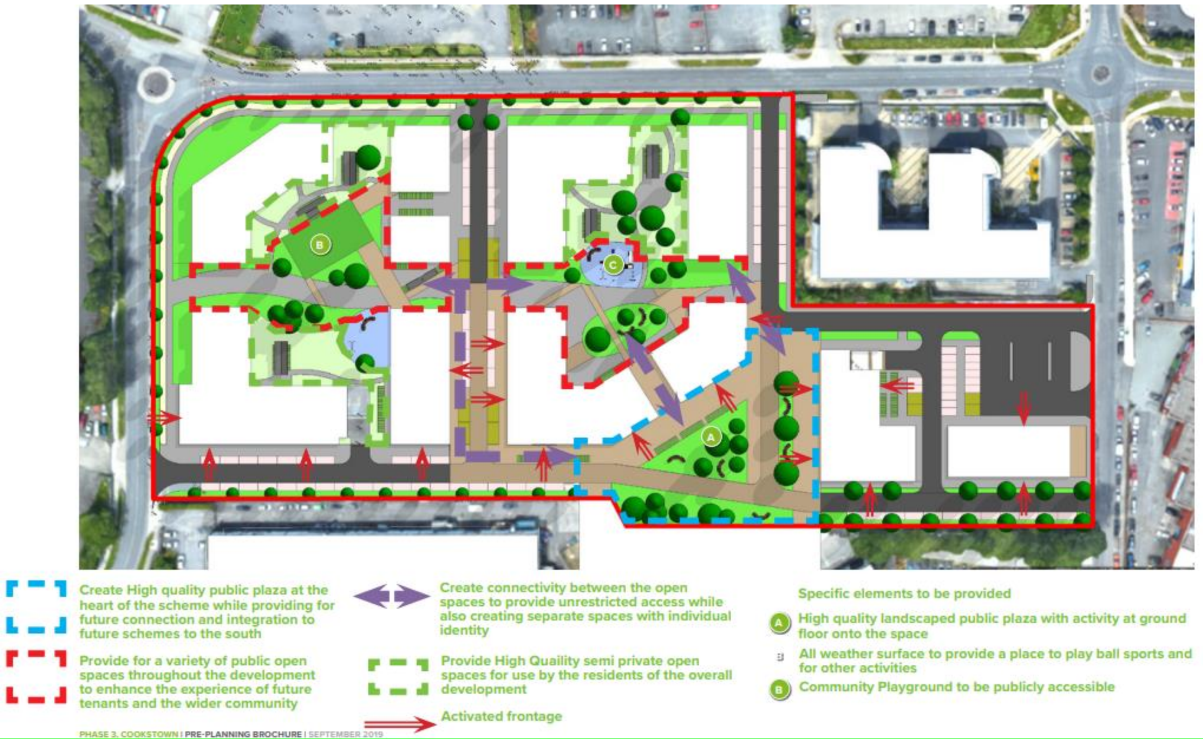


Figure 2.44 Open Spaces & Landscaping Strategy for the proposed development on the southern parcel tabled at the pre-planning meeting with South Dublin County Council in October 2019

Figure 2.45 Ground floor use plan for the proposed development on the southern parcel tabled at the pre-planning meeting with South Dublin County Council in October 2019

Figure 2.46 Height strategy for the proposed development on the southern parcel tabled at the pre-planning meeting with South Dublin County Council in October 2019

Figure 2.47 Phasing strategy for the proposed development on the southern parcel tabled at the pre-planning meeting with South Dublin County Council in October 2019

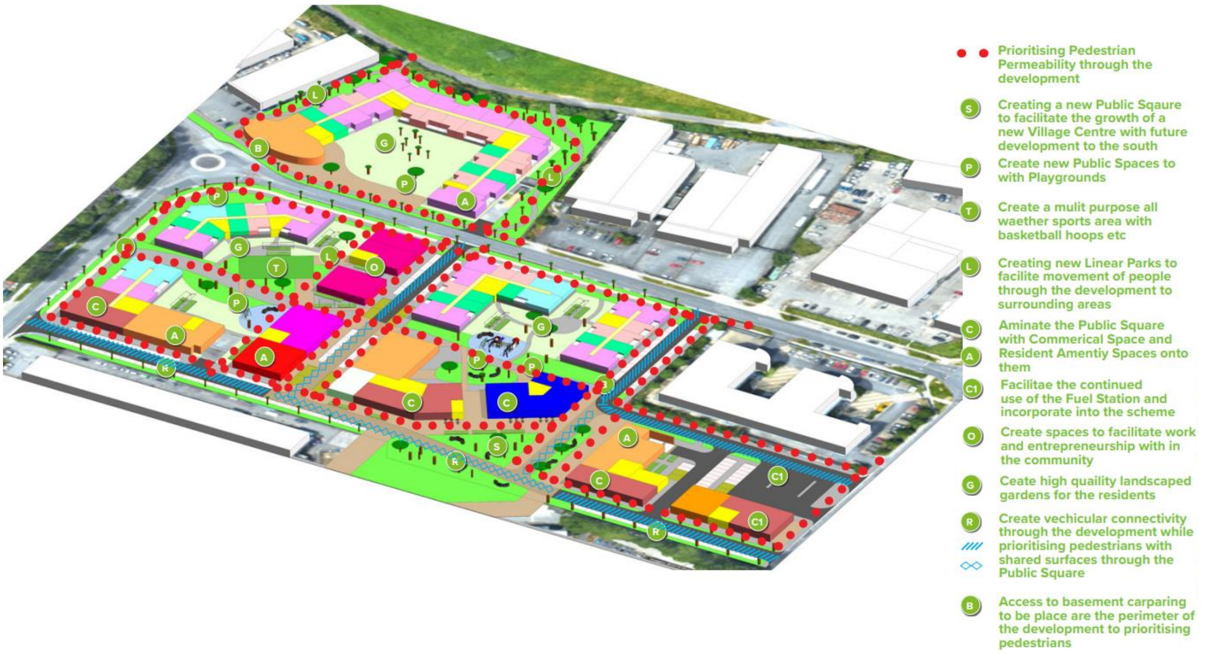


Figure 2.48 Overall strategy for the proposed development across the northern and southern parcels tabled at the pre-planning meeting with South Dublin County Council in October 2019

Option 4 – Design/Layout discussed at the pre-planning consultation with An Bord Pleanála on 20th February 2020

The fourth design option explored by C+W O'Brien Architects following the 3rd S247 pre-planning meeting with South Dublin County Council (illustrated in Figures 2.43-2.21 overleaf), which was subsequently tabled at the pre-planning consultation with An Bord Pleanála 20th February 2020, included the following key changes from the Option 3 design previously discussed:

- The northern and southern parcels were dealt with in one application;
- We verified that the land immediately north of our site is in the ownership of Dublin City Council and therefore the pedestrian link to the LUAS stop was capable of being created. The proposed pedestrian link was also been increased in size and features improved landscaping;
- The development adopted the tenure mix outlined with the Draft Tallaght Town Centre Local Area Plan 2020-2026;
- Duplex units were introduced adjacent to the southern boundary of the northern parcel, fronting onto the street;
- The proposed facades and ground floor elements were resolved and a clearer picture of the proposed street treatment provided;
- Residential units were omitted from the block immediately adjacent to the petrol station being retained, with offices now proposed in this area;
- The extent of commercial/retail uses being proposed was reduced;
- The public open space area was re-positioned in the south-western corner of the site to mirror the one proposed in the Draft Tallaght Town Centre Local Area Plan 2020-2026; and
- The phasing of development was reconsidered to take into account the desire expressed in the Draft Tallaght Town Centre Local Area Plan 2020-2026 that development be built out from the Luas Stops.

The development tabled at this meeting comprised the demolition of existing industrial units/buildings (totalling 15,989sq.m) and construction of a mixed-use development, featuring 1156 no. apartments (172 no. studios, 321 no. 1-bed apartments, 623 no. 2-bed apartments, 28 no. 3-bed apartments, 7 no. 4-bed apartments and 5 no. 2-bed duplex units), in 7 no. blocks varying in height from two to fifteen storeys over basement (totalling 125,789.995sq.m). The proposed development retained the existing petrol station (associated with Circle K Belgard) located in the north-eastern corner of the larger land parcel. The proposed scheme had a housing density of 289 dwellings per Ha, a plot ratio of 2.77 and a site coverage of 29%.

The development was served by an underground carpark located under Block's A, B and C with access point provided for each. This provided a total of 313 no. parking spaces (including 304 no. standard spaces and 9 no. mobility impaired user parking spaces). An additional 72 no. parking spaces were provided at ground floor level. The development was served by 2,120 no. bicycle spaces 1,896 no. resident spaces at basement level and 224 no. visitor spaces at ground floor level.

It was also proposed to construct a new road through the subject site, along the sites southern boundary, which linked Cookstown Road with the Old Belgard Road, as well as 2 no. new roads through the subject site linking Cookstown Road with the newly created through road. A new pedestrian link was proposed from Cookstown Road to the Belgard Luas Stop immediately north. More specifically, this new road and pedestrian link occuiedy the western part of the smaller parcel of land making up the subject site. The proposed road achieved the through street sought by the Tallaght Town Centre Local Area Plan in this position, in Section 3.2.

Figure 2.49 Proposed demolition plan tabled at the pre-planning consultation with An Bord Pleanála in February 2020

Figure 2.50 Proposed site plan of the proposed development tabled at the pre-planning consultation with An Bord Pleanála in February 2020

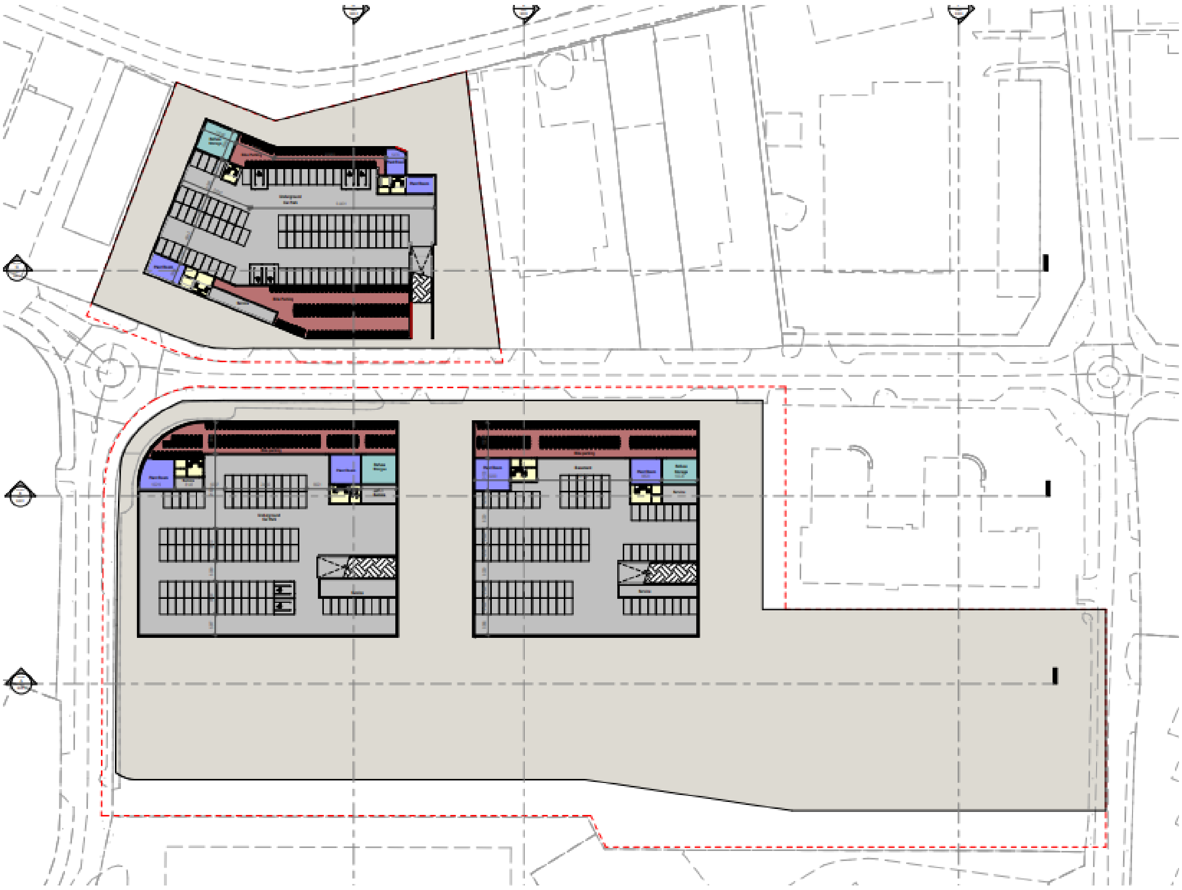


Figure 2.51 Proposed basement plan of the proposed development tabled at the pre-planning consultation with An Bord Pleanála in February 2020

Figure 2.52 Proposed ground floor plan of the proposed development tabled at the pre-planning consultation with An Bord Pleanála in February 2020

Figure 2.53 Western elevation of the proposed development as viewed from Cookstown Way tabled at the pre-planning consultation with An Bord Pleanála in February 2020

Figure 2.54 Northern elevation of the proposed development as viewed from Katherine Tynan Road tabled at the pre-planning consultation with An Bord Pleanála in February 2020

Option 5 - Final Scheme Submitted to An Bord Pleanála

As noted above, following the receipt of detailed feedback from An Board Pleanála, as well as South Dublin County Council, during the course of the pre-application consultation, and following receipt of the Notice of Opinion of the Board which advised on further consideration relating to aspects of the proposed development, the applicant and design team have made amendments to the design of the development proposal which are incorporated in the subject application. These include the following:

- The application boundary has been extended to include 0.98Ha of South Dublin County Council owned land and 0.19 Ha of Dublin City Council owned land. This extension facilitates the provision of a new pedestrian link from Cookstown Road to the Belgard Luas Stop immediately north and road, junction and streetscape upgrades along First Avenue, Cookstown Road and Old Belgard Road, including the installation a signalized junction at the intersection of First Avenue and Cookstown Road and the intersection of Old Belgard Road and Cookstown Road;
- The proposed building heights have been reduced resulting in a slight reduction in unit nos. The overall number of units resulting is 1104 no.;
- Resident car and bicycle parking spaces have been provided at podium level with communal open spaces provided at first floor level above;
- Communal open space areas provided at roof level have been designed to reduce potential wind impacts; and
- The layout of the ground floor open space area serving Block B has been revised to improve facilitate the provision of an outdoor playspace adjacent to the proposed creche.

2.5 “Do Nothing” Alternative

In the event of the ‘do-nothing’ scenario, the current use of the site is likely to continue, whereby the lands would remain in industrial/commercial use. A “do-nothing” scenario was considered to represent an inappropriate, unsustainable and inefficient use of these residential zoned lands. In addition, the additional demand / support for local infrastructure, services, and businesses would not be generated by any new population on the site; nor would local housing demand be catered for.

In terms of landscape and visual impact, the site would continue to have an industrial character.

2.6 Conclusion

Having examined various reasonable alternative designs and having engaged in extensive and detailed consultations with South Dublin County Council and An Bord Pleanala in the course of the design evolution of the current scheme, it is considered that the proposed design as set out in the subject SHD application is a preferable option in terms of the sustainable development of the subject site and the creation of a sustainable community neighbourhood insofar as it achieves a mixed-use development, including 1104 no. units and achieving a net residential density of 221 no. units per hectare. The current design achieves a range of apartment types, sizes, and designs whilst also providing adequate open space and achieving a strong urban edge and passive surveillance.

3.0 PLANNING AND DEVELOPMENT CONTEXT

3.1 Introduction

This section of the EIAR has been prepared by Hughes Planning and Development Consultants. More specifically, this chapter of the EIAR was prepared jointly by Mr. Kevin Hughes, Director, and Ms. Margaret Commane, Associate, with Hughes Planning and Development Consultants.

Mr. Kevin Hughes of Hughes Planning and Development Consultants, graduated from University College Dublin (UCD) with a Masters in Regional and Urban Planning (MRUP) in 2002, having previously completed a Bachelor of Arts Degree in Sociology from National University of Ireland in 1999. Kevin has over 18 years professional experience in the field of planning and development consultancy, which has included providing consultancy services in respect of several major urban regeneration projects including EIA. Kevin is currently the Director of Hughes Planning and Development Consultants.

Ms. Margaret Commane of Hughes Planning and Development Consultants, graduated from University College Cork (UCC) with a Masters in Planning and Sustainable Development (MPLAN) in 2012, having previously completed a Bachelor of Arts Degree in Geography and Legal Science from National University of Ireland in 2010. Margaret has over 7 years professional experience in the field of planning and development consultancy, which has included providing consultancy services in respect of several major urban regeneration projects including EIA. Margaret is currently an Associate in the Practice of Hughes Planning and Development Consultants.

It outlines the statutory planning context and the previous planning history for the subject site.

3.2 Statutory Planning Context

The subject lands are subject to national, regional and local objectives and planning policies. The following outlines the key planning documents of relevance to the future development of the subject lands. Documents of note are as follows:

National

- Project Ireland 2040 – National Planning Framework (2018);
- National Development Plan 2018-2027;
- Urban Development and Building Heights - Guidelines for Planning Authorities, December 2018;
- Rebuilding Ireland – Action Plan for Housing and Homelessness, July 2016;
- Department of Housing, Planning and Local Government Circular PL 8/2016 APH 2/2016;
- Quality Housing for Sustainable Communities – Guidelines for Planning Authorities (2007);
- Sustainable Residential Development in Urban Areas – Guidelines for Planning Guidelines (2009);
- Urban Design Manual – A Best Practice Guide 2009;
- Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities (2018);
- Design Manual for Urban Roads and Streets (2013);
- The Planning System and Flood Risk Management Guidelines for Planning Authorities (2009) and
- Guidelines for Planning Authorities on Childcare Facilities (2001).

Regional

- Regional Spatial & Economic Strategy for the Eastern and Midland Regional Assembly, June 2019.

County

- South Dublin County Development Plan 2016-2022.

Local

- Tallaght Town Centre Local Area Plan 2020-2026.

This section will briefly detail the policies and objectives contained in the various plans which are relevant to the proposed mixed-use development in the Cookstown Industrial Estate. An assessment of the proposed development against the relevant policies and objectives is provided in the Statement of Consistency and Planning Report, prepared by Hughes Planning and Development Consultants, which accompanies the planning application.

3.2.1 Project Ireland 2040 – National Planning Framework (2018)

The Project Ireland 2040 - National Planning Framework (2018) seeks more balanced and concentrated growth, particularly within the five major cities in Ireland. The following target is outlined in relation to national growth:

> *We have five cities in Ireland today in terms of population size (>50,000 people): Dublin, Cork, Limerick, Galway and Waterford. In our plan we are targeting these five cities for 50% of overall national growth between them, with Ireland's large and smaller towns, villages and rural areas accommodating the other 50% of growth.*

More specifically, strategies are included in Chapter 2.2 of the Planning Framework which seek to target a greater proportion (40%) of future housing development to be within and close to the existing 'footprint' of built-up areas. This target is to be achieved by making better use of under-utilised land and buildings, including 'infill', 'brownfield' and publicly owned sites and vacant and under-occupied buildings, with higher housing and jobs densities, better serviced by existing facilities and public transport.

Moreover, we would note the following national policy objectives as per Project Ireland 2040:

National Policy Obj. 3a	*Deliver at least 40% of all new homes nationally, within the built-up footprint of existing settlements.*
National Policy Obj. 3b	*Deliver at least half (50%) of all new homes that are targeted in the five Cities and suburbs of Dublin, Cork, Limerick, Galway and Waterford, within their existing built-up footprints.*
National Policy Obj. 13	*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.*
National Policy Obj. 35	*Increase residential density in settlements, through a range of measures including reductions in vacancy, re-use of existing buildings, infill development schemes, area or site-based regeneration and increased building heights.*

3.2.2 National Development Plan 2018—2027

The National Development Plan 2018—2027 sets out the investment priorities that will underpin the successful implementation of the National Planning Framework, including the development of the necessary housing stock set out therein. The National Development Plan demonstrates the Government's commitment to meeting Ireland's infrastructure and investment needs over the next ten years, through a total investment estimated at €116 billion over the period. This includes investment in high quality integrated public and sustainable transport systems as well as health and education.

One of the two investment priorities envisaged by this plan in relation to education, more specifically the higher education sector, is bolstering the capacity of multi-campus Technological Universities and of Institutes of Technology. Technological University Dublin-Tallaght Campus is identified as one of the Institutes of Technology to benefit from future investment.

With regards to health, a Paediatric Outpatients and Urgent Care Centre is due to open at Tallaght Hospital in 2020, while Tallaght Hospital is also identified for Renal Dialysis and Intensive Care Units within the life of the plan.

3.2.3 Urban Development and Building Heights - Guidelines for Planning Authorities, December 2018

These guidelines are intended to set out national planning policy guidelines on building heights in relation to urban areas, as defined by the census, building from the strategic policy framework set out in Project Ireland 2040 and the National Planning Framework.

These guidelines outline that there is significant scope to accommodate anticipated population growth and development needs, whether for housing, employment or other purposes, by building up and consolidating the development of our existing urban areas. The rationale for consolidation and densification to meet our accommodation needs applies in relation to locations that development plans and local area plans would regard as city and town centre areas as well as areas in and around existing urban areas and suburban areas.

This policy encourages the facilitation of increased levels of residential development in our urban centres and significant increases in the building heights and overall density of development through the planning process, particularly at local authority and An Bord Pleanála levels. Increasing prevailing building heights is deemed to have a critical role to play in addressing the delivery of more compact growth in our urban areas, particularly our cities and large towns through enhancing both the scale and density of development.

In particular, increased density and height of development within the footprint of developing sustainable mobility corridors and networks, where substantial investment in public transport infrastructure has been made as part of Project Ireland 2040. SPPR 1 goes on to outline the following in relation to this:

> *In accordance with Government policy to support increased building height in locations with good public transport accessibility, particularly town/ city cores, planning authorities shall explicitly identify, through their statutory plans, areas where increased building height will be actively pursued for both redevelopment and infill development to secure the objectives of the National Planning Framework and Regional Spatial and Economic Strategies and shall not provide for blanket numerical limitations on building height.*

Section 3.2 of the Building Height Guidelines states that:

> *To support proposals at some or all of these scales, specific assessments may be required and these may include:*
>
> - *Specific impact assessment of the micro-climatic effects such as downdraft. Such assessments shall include measures to avoid/ mitigate such micro-climatic effects and, where appropriate, shall include an assessment of the cumulative micro-climatic effects where taller buildings are clustered.*
> - *In development locations in proximity to sensitive bird and / or bat areas, proposed developments need to consider the potential interaction of the building location, building materials and artificial lighting to impact flight lines and / or collision.*
> - *An assessment that the proposal allows for the retention of important telecommunication channels, such as microwave links.*
> - *An assessment that the proposal maintains safe air navigation.*
> - *An urban design statement including, as appropriate, impact on the historic built environment.*
> - *Relevant environmental assessment requirements, including SEA, EIA, AA and Ecological Impact Assessment, as appropriate.*

3.2.4 Rebuilding Ireland – Action Plan for Housing and Homelessness, July 2016

The 'Action Plan for Housing and Homelessness' was published in July 2016 as part of the Government's Rebuilding Ireland initiative. This is a whole-of-Government plan seeks to double residential construction output to 25,000 homes per year by 2020; deliver 47,000 units of social housing by 2021; make the best use of existing housing stock; and lay the foundations for a stronger, more stable private rented sector. The Action Plan seeks to address existing issues of housing supply and homelessness in Ireland through five 'Pillars'. Pillar 4, 'Improving the Rental Sector', includes build-to-rent and encourages "build-to-rent" as a key action. It is stated that a build-to-rent model can deliver additional supply towards the overall target supply of 25,000 units per annum.

3.2.5 Department of Housing, Planning and Local Government Circular PL 8/2016 APH 2/2016

The Department of Housing, Planning, Community and Local Government (DHPCLG) issued a Circular Letter in 2016, states that the emerging Build to Rent (BTR) sector offers significant new opportunities to increase the scale and pace of delivery of housing. Planning authorities are requested to proactively encourage and work with proposers of BTR projects to facilitate their emergence at appropriate locations. The Department is giving active consideration to issuing further guidance in relation to this important new sector of housing provision in the near term.

3.2.6 Quality Housing for Sustainable Communities – Guidelines for Planning Authorities (2007)

The purpose of these Guidelines is to assist in achieving the objectives for Delivering Homes, Sustaining Communities contained in the Government Statement on Housing Policy which focuses on creating sustainable communities that are socially inclusive by promoting high standards in the design and construction and in the provision of residential amenity and services in new housing schemes.

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

The Sustainable Residential Development in Urban Areas – Guidelines for Planning Guidelines (2009) updated and revised earlier guidance of 1999. These statutory guidelines, which were brought forward to improve the quality of homes and neighbourhoods, set out best practice design criteria and provide a robust framework in which proposals for residential development should be considered. They establish a series of high level aims for successful and sustainable development in urban areas

3.2.8 Urban Design Manual – A Best Practice Guide 2009

The '*Urban Design Manual – A Best Practice Guide, 2009'* is based around twelve questions that have been drawn up to encapsulate a full range of design considerations for residential development such as that proposed on the subject site. These questions are *'a distillation of current policy and guidance and tried and tested principles of good urban design.'*

3.2.9 Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities (2018)

The proposed development has been designed to be fully comply with the standards set out in the *Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities*, published by the Department of the Environment, Community and Local Government in March 2018. The 2018 Guidelines update previous guidance in the context of greater evidence and knowledge of current and likely future housing demand in Ireland taking account of the Housing Agency National Statement on Housing Demand and Supply, the Government's action programme on housing and homelessness Rebuilding Ireland and Project Ireland 2040 and the National Planning Framework, published since the 2015 guidelines.

Furthermore, the 2018 Guidelines include guidance specific to the emerging 'build to rent' and 'shared accommodation' sectors, which did not feature in the previous 2015 Guidelines. These are set out in

Section 5.0 and Specific Planning Policy Requirements 7 and 8 included therein relate specifically to build-to-rent developments.

Specific Planning Policy Requirement 7 reads as follows:

Specific Planning Policy Requirement 7

BTR development must be:

a) Described in the public notices associated with a planning application specifically as a 'Build-To-Rent' housing development that unambiguously categorises the project (or part of thereof) as a long-term rental housing scheme, to be accompanied by a proposed covenant or legal agreement further to which appropriate planning conditions may be attached to any grant of permission to ensure that the development remains as such. Such conditions include a requirement that the development remains owned and operated by an institutional entity and that this status will continue to apply for a minimum period of not less than 15 years and that similarly no individual residential units are sold or rented separately for that period;

b) Accompanied by detailed proposals for supporting communal and recreational amenities to be provided as part of the BTR development. These facilities to be categorised as:

i. Resident Support Facilities - comprising of facilities related to the operation of the development for residents such as laundry facilities, concierge and management facilities, maintenance/repair services, waste management facilities, etc.
ii. Resident Services and Amenities – comprising of facilities for communal recreational and other activities by residents including sports facilities, shared TV/lounge areas, work/study spaces, function rooms for use as private dining and kitchen facilities, etc.

Specific Planning Policy Requirement 8 read as follows:

Specific Planning Policy Requirement 8

For proposals that qualify as specific BTR development in accordance with SPPR 7:

i. No restrictions on dwelling mix and all other requirements of these Guidelines shall apply, unless specified otherwise;
ii. Flexibility shall apply in relation to the provision of a proportion of the storage and private amenity space associated with individual units as set out in Appendix 1 and in relation to the provision of all of the communal amenity space as set out in Appendix 1, on the basis of the provision of alternative, compensatory communal support facilities and amenities within the development. This shall be at the discretion of the planning authority. In all cases the obligation will be on the project proposer to demonstrate the overall quality of the facilities provided and that residents will enjoy an enhanced overall standard of amenity;
iii. There shall be a default of minimal or significantly reduced car parking provision on the basis of BTR development being more suitable for central locations and/or proximity to public transport services. The requirement for a BTR scheme to have a strong central management regime is intended to contribute to the capacity to establish and operate shared mobility measures;
iv. The requirement that the majority of all apartments in a proposed scheme exceed the minimum floor area standards by a minimum of 10% shall not apply to BTR schemes;
v. The requirement for a maximum of 12 apartments per floor per core shall not apply to BTR schemes, subject to overall design quality and compliance with building regulations.

The standards applying to 'Build-to-Rent' schemes is discussed below.

Minimum Floor Area

Specific Planning Policy Requirement 3 sets out minimum apartment floor areas. The overall apartment floor area sizes required for apartment units area as follows:

- *Studio apartment* *37sq.m*
- *1-bedroom apartment* *45sq.m*
- *2-bedroom apartment (3 persons)* *63sq.m*
- *2-bedroom apartment (4 persons)* *73sq.m*
- *2-bedroom apartment (4 persons)* *73sq.m*
- *3-bedroom apartment (5 persons)* *90sq.m*

The requirement that the majority of all apartments in a proposed scheme exceed the minimum floor area standards by a minimum of 10%, set out in Section 3.8 does not apply to build-to-rent schemes, pursuant to Specific Planning Policy Requirement 8(iv).

Minimum Aggregate Floor Areas and Minimum Widths for Living/Dining/Kitchen

The 2018 Guidelines require the following minimum aggregate floor areas in relation to living/Dining/Kitchen Areas:

- *Studio* *30sq.m, minimum width 4m*
- *One Bedroom* *23sq.m, minimum width 3.3m*
- *Two Bedroom (3P)* *28sq.m, minimum width 3.6m*
- *Two Bedroom (4P)* *30sq.m, minimum width 3.6m*
- *Three Bedroom (5P)* *34sq.m, minimum width 3.8m*

Minimum Floor Areas, Minimum Widths and Minimum Aggregate Floor Areas for Bedrooms

The 2018 Guidelines require the following minimum aggregate floor areas, minimum widths and minimum aggregate floor areas in relation to bedrooms:

- *Studio* *30sq.m, minimum width 4m*
- *Single Bedroom* *7.1sq.m, minimum width 2.1m*
- *Double Bedroom* *11.4sq.m, minimum width 2.8m*
- *Twin Bedroom* *13sq.m, minimum width 2.8m*

The overall aggregate bedroom floor areas for apartment unit areas is required as follows:

- *One bedroom - 11.4 sq m*
- *Two bedrooms (3 person) - 13 + 7.1 sq m = 20.1 sq m*
- *Two bedrooms (4 person) - 11.4 + 13 sq m = 24.4 sq m*
- *Three bedrooms - 11.4 + 13 + 7.1 sq m = 31.5 sq m*

Dual Aspect Ratios

Specific Planning Policy Requirement 4 provides guidance with regard to dual aspect apartments. The minimum number of dual aspect apartments are as follows:

(i) A minimum of 33% of dual aspect units will be required in more central and accessible urban locations, where it is necessary to achieve a quality design in response to the subject site characteristics and ensure good street frontage where appropriate.
(ii) In suburban or intermediate locations it is an objective that there shall generally be a minimum of 50% dual aspect apartments in a single scheme.
(iii) For building refurbishment schemes on sites of any size or urban infill schemes on sites of up to 0.25ha, planning authorities may exercise further discretion to consider dual aspect unit provision at a level lower than the 33% minimum outlined above on a case-by-case basis, but subject to the achievement of overall high design quality in other aspects.

Internal Storage

The minimum internal storage areas required for apartment units outlined in the 2018 Guidelines are as follows:

- *Studio* *3sqm*
- *One bedroom* *3sqm*
- *Two bedrooms (3 person)* *5sqm*
- *Two bedrooms (4 person)* *6sqm*
- *Three or more bedrooms* *9sqm*

Minimum private open space requirements

The Guidelines provides minimum private open space requirements in new apartments. They are as follows:

- *Studio* *4sqm*
- *One Bedroom* *5sqm*
- *Two Bedrooms (3P)* *6sqm*
- *Two Bedrooms (4P)* *7sqm*
- *Three or more Bedrooms* *9sqm*

Minimum communal amenity space requirements

The Guidelines provides minimum communal amenity space requirements in new apartments. They are as follows:

- *Studio* *4sqm*
- *One Bedroom* *5sqm*
- *Two Bedrooms (3P)* *6sqm*
- *Two Bedrooms (4P)* *7sqm*
- *Three or more Bedrooms* *9sqm*

The guidelines also outline the following in relation to communal amenity space:

> *Communal amenity space may be provided as a garden within the courtyard of a perimeter block or adjoining a linear apartment block. Designers must ensure that the heights and orientation of adjoining blocks permit adequate levels of sunlight to reach communal amenity space throughout the year.*

Floor to Ceiling Height

The Guidelines require minimum floor to ceiling heights of 2.4m for apartments above ground floor, and 2.7m at ground floor to allow flexibility for future use. With floor to ceiling heights of 2.4m-2.7m for all apartments within the scheme, the proposal complies with the Guidelines in both respects.

Security Considerations

Section 3.40 of the Guidelines recommend that in order to ensure visitor and occupant safety natural surveillance should be maximised for all streets, open spaces, play areas and any surface bicycle or car parking areas. Particular attention should be given to entrance points being well lit and overlooked in building blocks. Consideration should also be given to incorporating privacy strips in instances where ground floor apartments front onto public footpaths.

Bicycle Parking

The Guidelines seek that the design of apartment schemes should ensure that bicycle parking spaces are located to be conveniently accessible to residents, both in terms of proximity to access points to apartments and routes to the external road / street network. The following requirements are also specified in relation to quantity:

> *Quantity – a general minimum standard of 1 cycle storage space per bedroom shall be applied. For studio units, at least 1 cycle storage space shall be provided. Visitor cycle parking shall also be provided at a standard of 1 space per 2 residential units. Any deviation from these standards shall be at the discretion of the planning authority and shall be justified with respect to factors such as location, quality of facilities proposed, flexibility for future enhancement/enlargement, etc.*

3.2.10 Design Manual for Urban Roads and Streets (2019)

This Manual seeks to address street design within urban areas (i.e. cities, towns and villages). It sets out an integrated design approach. What this means is that the design must be:

a) Influenced by the type of place in which the street is located, and
b) Balance the needs of all users.

A further aim of this Manual is to put well designed streets at the heart of sustainable communities.

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

These Guidelines introduce comprehensive mechanisms for the incorporation of flood risk identification, assessment and management into the planning process. Implementation of the Guidelines will be achieved through actions at the national, regional, local authority and site-specific levels.

3.2.12 Guidelines for Planning Authorities on Childcare Facilities (2001)

The Guidelines for Planning Authorities on Childcare Facilities (2001) indicate that Development Plans should facilitate the provision of childcare facilities in appropriate locations. These include larger new housing estates where planning authorities should require the provision of a minimum of one childcare facility with 20 places for each 75 dwellings. The threshold for provision should be established having regard to existing location of facilities and the emerging demography of the area where new housing is proposed. The Guidelines advise that sites should be identified for such facilities as an integral part of the pre-planning discussions.
The following definition of Childcare is included in the Guidelines:

> *In these Guidelines, "childcare" is taken to mean full day-care and sessional facilities and services for pre-school children and school-going children out of school hours. It includes services involving care, education and socialisation opportunities for children. Thus, services such as pre-schools, naíonraí (Irish language playgroups), day-care services, crèches, playgroups, and after-school groups are encompassed by these Guidelines. Conversely childminding, schools, (primary, secondary and special) and residential centres for children are not covered by these Guidelines.*

The South Dublin County Council Development Plan 2016-2022, in Sections 3.10, includes the following policy and guidance in relation to childcare facilities:

Policy C8 (b) *It is the policy of the Council to require the provision of new childcare facilities in tandem with the delivery of new communities.*

> *C8 Objective 2:* *To require childcare infrastructure to be provided in new communities on a phased basis in tandem with the delivery of residential development, in accordance with the phasing requirements of Local Area Plans or approved Planning Schemes.*

The Tallaght Town Centre Local Area Plan 2020-2026, in Section 5.3.2, includes the following policy in relation to childcare facilities:

It is policy of the plan to facilitate the sustainable development of good quality and accessible early childhood care (early years and general childcare both home based and centre based) and education infrastructure (Objective CF 4).

The Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities (2018) also includes the following guidance in relation to childcare facility provision:

Notwithstanding the Planning Guidelines for Childcare Facilities (2001), in respect of which a review is to be progressed, and which recommend the provision of one child-care facility (equivalent to a minimum of 20 child places) for every 75 dwelling units, the threshold for provision of any such facilities in apartment schemes should be established having regard to the scale and unit mix of the proposed development and the existing geographical distribution of childcare facilities and the emerging demographic profile of the area. One-bedroom or studio type units should not generally be considered to contribute to a requirement for any childcare provision and subject to location, this may also apply in part or whole, to units with two or more bedrooms.

3.2.13 Regional Spatial and Economic Strategy for the Eastern and Midland Region, 2019

The Regional Spatial and Economic Strategy for the Eastern and Midland Region (DRSES) was published in June 2019. A Regional Spatial & Economic Strategy (RSES) is a strategic plan which identifies regional assets, opportunities and pressures and provides appropriate policy responses in the form of Regional Policy Objectives. At this strategic level, it provides a framework for investment to better manage spatial planning and economic development throughout the Region. The principal statutory purpose of the RSES is to support the implementation of Project Ireland 2040 and the economic policies and objectives of the Government by providing a long-term strategic planning and economic framework for the development of the Regions.

The DSES states that there is further capacity for regeneration of major brownfield lands in Tallaght. It places Tallaght within the South-West Strategic Corridor (Kildare line-Luas red line) which has a population capacity in the short to medium term of 66,000. A key aim is to unlock the development capacity of strategic development areas within the Dublin metropolitan area. The following Regional Policy Objective supports the proposed development:

'RPO 4.3: Support the consolidation and re-intensification of infill/brownfield sites to provide high density and people intensive uses within the existing built up area of Dublin City and suburbs and ensure that the development of future development areas is co-ordinated with the delivery of key water infrastructure and public transport projects.'

3.2.14 South Dublin County Development Plan 2016-2022

3.2.1.14.1 Core Strategy

Set out in Chapter 1 of the South Dublin County Development Plan 2016-2022 is the 'Core Strategy', which outlines the medium to long term strategy for the spatial development for the county by way of policies and objectives, translating the strategic planning framework set out at national and regional levels.

The following policies and objectives set out in the 'Core Strategy are relevant to the application site:

Policy CS1: *It is policy of the Council to promote the consolidation and sustainable intensification of development to the east of the M50 and south of the River Dodder*.

CS1 Objective 2: To promote and support the regeneration of underutilised industrial areas in areas designated with Zoning Objective Regeneration 'REGEN' (to facilitate enterprise and/or residential led development).

Policy CS2: *It is the policy of the Council to support the sustainable long term growth of Metropolitan Consolidation Towns through consolidation and urban expansion.*

CS2 Objective 4: *To promote and support the regeneration of underutilised industrial areas within areas designated with Zoning Objective Regeneration 'REGEN' (to facilitate enterprise and/or residential led regeneration).*

CS2 Objective 6: *To promote higher residential densities at appropriate locations, adjacent to town centres or high capacity public transport nodes (Luas/Rail).*

The objective of the 'Core Strategy' is to focus residential-led development to areas with capacity to absorb more intensified forms of development that support the long term growth of the Metropolitan Consolidation Towns. The 'Core Strategy' makes particular reference to higher residential densities being supported at appropriate locations in close proximity to town centres or high capacity public transport nodes, noting underutilised industrial lands, or 'REGEN' zoned lands, adjacent to LUAS and Rail services as priority sites.

3.2.14.2 Zoning

Under the South Dublin County Development Plan 2016-2022, the subject site is zoned 'REGEN', the objective of which is '*to facilitate enterprise and/or residential-led regeneration*' (refer to map excerpts below). Land uses permitted in principle in this zoning consist of the following:

> *'Advertisements and Advertising Structures, Childcare Facilities, Community Centre, Education, Enterprise Centre, Health Centre, Home Based Economic Activities, Hotel/Hostel, Housing for Older People, Industry-Light, Live-Work Units, Motor Sales Outlet, Office-Based Industry, Office less than 100 sq.m, Offices 100 sq.m –1,000 sq.m, Offices over 1,000 sq.m, Open Space, Petrol Station, Public Services, Recreational Facility, Residential, Restaurant/Café, Residential Institution, Science and Technology Based Enterprise, Shop-Local, Sports Club/Facility, Stadium, Traveller Accommodation.'*

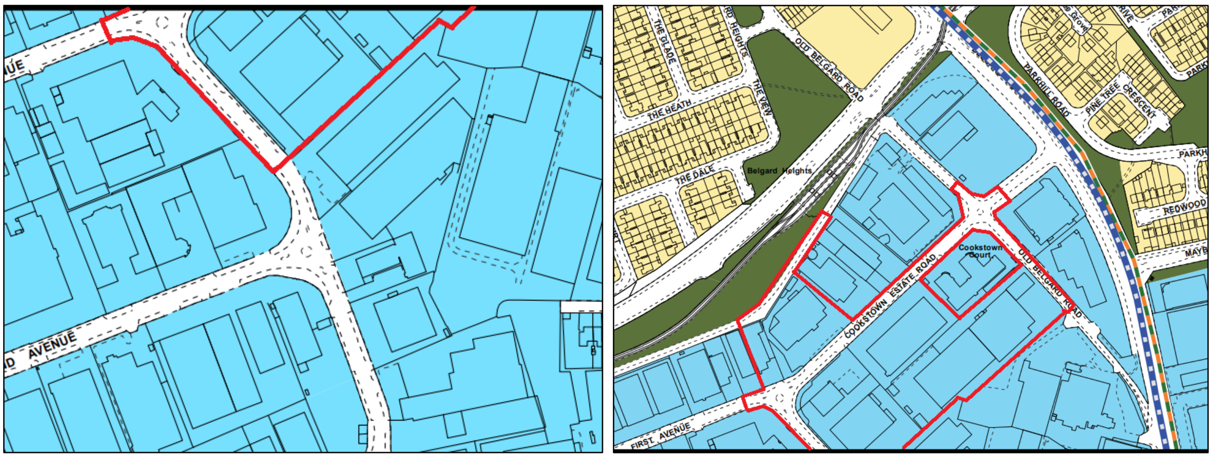


Figure 3.1 Extracts from South Dublin County Development Plan 2016-2022 zoning Map Nos. 5 and 9 showing the application site (in red) within lands with Zoning Objective 'REGEN'

The 'REGEN' zone is a new addition to the land-use zoning classifications, in the South Dublin County Development Plan 2016-2022, and is aimed at supporting and facilitating the regeneration of underutilised industrial lands that are within close proximity to town centres and/or public transport nodes, with a particular emphasis on more intensive enterprise and residential led development. The 'REGEN' zone is a relatively broad zoning designation under which a wide range of uses may be permitted.

Section 4.3.2 'Employment and residential in Regeneration Zones' set out in the South Dublin County Development Plan 2016-2022 outlines how the Council recognises that there are a high level of vacant lands of poor environmental quality throughout the county, and will seeks to support and facilitate a more intensive mix of enterprise and/or residential led development in 'REGEN' zoned lands, in particular in instances where the regeneration relates to underutilised industrial lands that are in close proximity to town centres and public transport nodes.

Policy ET2: *It is the policy of the Council to facilitate and support the regeneration of underutilised industrial areas that are proximate to urban centres and transport nodes and to promote and support more intensive compatible employment and/or residential led development in regeneration zones.*

ET2 Objective 2: To support proposals for more intensive compatible enterprise and/or residential led development on lands designated with Zoning Objective 'REGEN', subject to appropriate design safeguards and based on a traditional urban form that adhere to urban design criteria.

3.2.14.3 Housing

As set out in Chapter 2 of the South Dublin County Development Plan 2016-2022, a core objective is to provide new housing of good quality, with a focus on the creation of sustainable new communities at locations that can be well served by high quality public transport, with a particular focus on the intensification of infill and brownfield lands with links to existing transport services. It is noted in this section of the development plan that South Dublin County Council will require 32,132 no. additional housing units over the period from 2015 to 2022, and the 'Interim Housing Strategy' forecasts that 8,303 no. social housing units will be required during this period as well, with approximately 2,000 housing units being delivered through Part V of the Planning and Development Act 2000 (as amended).

The following development plan policies are relevant to the proposal on the subject site:

Policy H2: *It is the policy of the Council to seek to ensure that sufficient zoned land continues to be available at appropriate locations to satisfy the housing requirements of the County.*

Policy H6: *It is the policy of the Council to support the development of sustainable communities and to ensure that new housing development is carried out in accordance with Government policy in relation to the development of housing and residential communities.*

Policy H7: *It is the policy of the Council to ensure that all new residential development within the County is of high quality design and complies with Government guidance on the design of sustainable residential development and residential streets including that prepared by the Minister under Section 28 of the Planning & Development Act 2000 (as amended).*

Policy H8: *It is the policy of the Council to promote higher residential densities at appropriate locations and to ensure that the density of new residential development is appropriate to its location and surrounding context.*

Policy H9: *It is the policy of the Council to support varied building heights across residential and mixed use areas in South Dublin County.*

Policy H11: *It is the policy of the Council to promote a high quality of design and layout in new residential development and to ensure a high quality living environment for residents, in terms of the standard of individual dwelling units and the overall layout and appearance of the development.*

Policy H13: *It is the policy of the Council to ensure that all dwellings have access to high quality private open space (inc. semi-private open space for duplex and apartment units) and that private open space is carefully integrated into the design of new residential developments.*

Policy H14: *It is the policy of the Council to ensure that all new housing provides a high standard of accommodation that is flexible and adaptable, to meet the long term needs of a variety of household types and sizes.*

Policy H15: *It is the policy of the Council to promote a high standard of privacy and security for existing and proposed dwellings through the design and layout of housing.*

The objective for housing in the South Dublin County Council administrative area is provide high quality residential development that contributes to the communities. In this regard housing in 'REGEN' zoned lands at higher density will be supported where it respects the residential development established in the surrounding area and comply with the Government guidance in terms of design and sustainability, adaptability and where adequate private amenity open space and public open space is provided with passive surveillance. Higher buildings will also be supported in such areas, however, varied heights is preferable.

3.2.14.4 Building Height

It is stated in Section 5.1.5 of the South Dublin County Development Plan 2016-2022 that varied building heights are supported for proposed developments within urban centres and regeneration zones, and are recognised as playing a key role in creating a sense of place, urban legibility and visual diversity. It is noted in this section of the development plan that proposals for building in excess of five-storeys in height will only be considered at strategic and landmark locations in Town Centres, Regeneration and Strategic Development Zones in accordance with Local Area Plans or SDZ Planning Schemes.

Policy UC6: *It is policy of the Council to support varied building heights across town, district, village and local centres and regeneration areas in South Dublin County.*

UC6 Objective 1: To encourage varied building heights in town, district, village, local and regeneration areas to support compact urban form, sense of place, urban legibility and visual diversity while maintaining a general restriction on the development of tall buildings adjacent to two-storey housing.

UC6 Objective 2: To ensure that higher buildings in established areas take account of and respect the surrounding context.

UC6 Objective 3: To direct tall buildings that exceed five storeys in height to strategic and landmark locations in Town Centre, Regeneration and Strategic Development Zones, and subject to an approved Local Area Plan or Planning Scheme.

The subject site is situated within 'REGEN' – Regeneration area, which under the current development plan is designated for building heights up to five-storeys and allows for up to seven-storeys at landmark locations.

3.2.14.5 Landscaping / Public Open Space / Children's Play

Section 11.3.1 of the South Dublin County Development Plan 2016-2022 requires that a detailed landscape plan be provided that outlines the extent of open space and treatments within residential and mixed-use developments of 10 units and above.

In addition, the development plan requires that 10% of the total site area for residential developments in 'REGEN' zoned lands are to be allocated to public open space, and in the case of residential developments exceeding 50 units provisions for children's play areas will be required.

3.2.14.6 Car Parking and Traffic

Car Parking

The South Dublin County Development Plan 2016-2022 requires any new development provide a maximum of car parking spaces depending on the location of the development. The maximum parking rates for residential development are divided into 2 no. categories, which are as follows:

- ***Zone 1:*** *General rate applicable throughout the County.*

- ***Zone 2*** *(Non Residential): More restrictive rates for application within town and village centres, within 800 metres of a Train or Luas station and within 400 metres of a high quality bus service (including proposed services that have proceeded to construction).*

- ***Zone 2*** *(Residential): More restrictive rates for application within town and village centres, within 400 metres of a high quality public transport service 5 (includes a train station, Luas station or bus stop with a high quality service)'.*

The maximum parking rates associated with new residential developments, as set out in Table 11.24 of the South Dublin County Development Plan 2016-2022 are as follows:

- *1 no. space per 1 bed apartment in Zone 1 and 0.75 spaces in Zone 2;*
- *1.25 spaces per 2 bed apartment in Zone 1 and 1 space in Zone 2; and*
- *1.5 spaces per 3 bed apartment in Zone 1 and 1.25 spaces in Zone 2.*

The proposed development, on the basis of its proximity to the Belgard Luas stop is situated in Zone 2, is therefore required to provide 0.75 spaces per studio and 1 bed apartment and 1 space per 2 bed apartments.

It is noted in Section 11.4.2 'Car Parking Standards' that the number of spaces set out above are not be exceeded, and in some instances a lower rate of parking may acceptable subject to the following:

- *The proximity of the site to public transport and the quality of the transport service it provides. (This should be clearly outlined in a Design Statement submitted with a planning application),*
- *The proximity of the development to services that fulfil occasional and day to day needs*
- *The existence of a robust and achievable Workforce Management or Mobility Management Plan for the development,*
- *The ability of people to fulfil multiple needs in a single journey,*
- *The levels of car dependency generated by particular uses within the development,*
- *The ability of residents to live in close proximity to the workplace,*
- *Peak hours of demand and the ability to share spaces between different uses,*
- *Uses for which parking rates can be accumulated, and*
- *The ability of the surrounding road network to cater for an increase in traffic.*

Furthermore, the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities (2018) outline that the quantum of car parking or the requirement for any such provision for apartment developments will vary, having regard to the types of location in cities and towns that may be suitable for apartment development, broadly based on proximity and accessibility criteria. The following guidance is provided in regards to Central and/or Accessible Urban Locations:

> *In larger scale and higher density developments, comprising wholly of apartments in more central locations that are well served by public transport, the default policy is for car parking provision to be minimised, substantially reduced or wholly eliminated in certain circumstances. The policies above would be particularly applicable in highly accessible areas such as in or adjoining city cores or at a confluence of public transport systems such rail and bus stations located in close proximity.*
>
> *These locations are most likely to be in cities, especially in or adjacent to (i.e. within 15 minutes walking distance of) city centres or centrally located employment locations. This includes 10 minutes walking distance of DART, commuter rail or Luas stops or within 5 minutes walking distance of high frequency (min 10 minute peak hour frequency) bus services.*

More specifically, the following guidance is set out regarding car parking for build-to-rent developments in Specific Planning Policy Requirement 8:

> *For proposals that qualify as specific BTR development in accordance with SPPR 7:*
>
> ……………
>
> *(iii) There shall be a default of minimal or significantly reduced car parking provision on the basis of BTR development being more suitable for central locations and/or proximity to public transport services. The requirement for a BTR scheme to have a strong central management regime is intended to contribute to the capacity to establish and operate shared mobility measures;*

3.2.15 Tallaght Town Centre Local Area Plan 2020-2026

The subject site is located within the Tallaght Town Centre Local Area Plan 2020-2026 area. This Local Area Plan (LAP) was adopted on 8th June 2020 and came into effect on 20th July 2020. The purpose of the LAP is to facilitate the future development of Tallaght Town centre, with the aim of creating a vibrant sustainable town.

3.2.15.1 Land Use Mix

Section 2.4.1 of the plan sets out the land use strategy for Tallaght Town Centre and the surrounding areas. The strategy has been informed by the planning and sustainable development criteria for area, such as proximity to existing and future public transport. The objective of the strategy is to locate future development to lands that are in close proximity of public transport services. As shown in the extract from the Urban Function map (included in Appendix 5 of the LAP) overleaf, the application site is located in the 'Cookstown' area (more specifically parcel CT-D) which has a land use zoning designation of 'Mixed Use A (High Mix Use)' and Mixed Use B (Residential and Mixed Use)'.

Section 3.3 includes the following guidance in relation to the land use mix/urban function desired within the Cookstown Neighbourhood:

> *A residential-led area, with a greater mix of use around Luas stops. A focus on more intensive enterprise, employment and innovation uses associated with existing uses such as the Hospital and TUD Tallaght. Community, social and other walk to services to provide for a growing residential population.*

The LAP also identifies mixed-use frontage in Section 2.4.2. As shown in the extract from the Mixed Use Frontage map (included in Figure 2.5 of the LAP) overleaf, in the context of the subject scheme, Cookstown Road is identified as a mixed use frontage. As a minimum, the mixed-use frontages identified in the Urban Function concept are required to have a mixed-use element and have a non-residential frontage at ground floor level, or some other acceptable alternative which performs the same function of providing activity at ground floor level. Appropriate uses at ground floor level on mixed use frontages can include offices, commercial, services, community facilities, recreational facilities, etc.

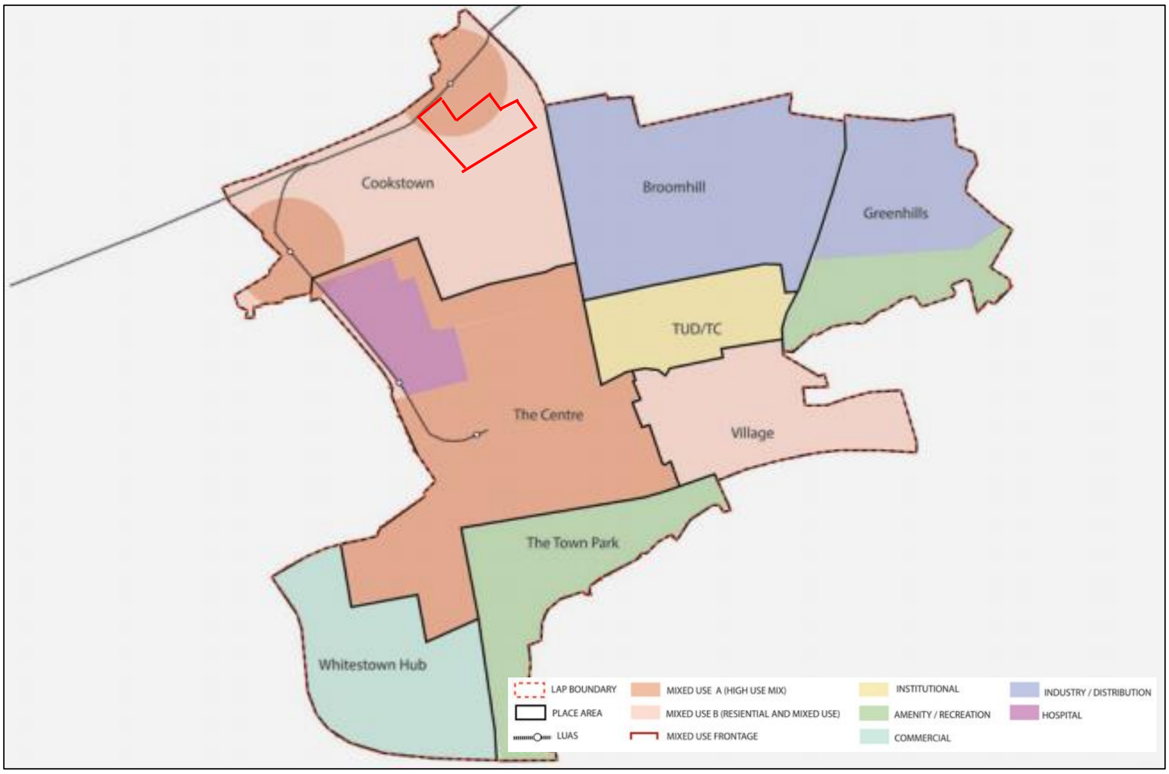


Figure 3.2 Urban Function Map from Tallaght Town Centre Local Area Plan 2020-2026 (subject site identified in red)

Figure 3.3 Mixed Use Frontage map from Tallaght Town Centre Local Area Plan 2020-2026 (subject site identified in red)

3.2.15.2 Key Objectives

The following Key Objectives are outlined for 'Cookstown' Neighbourhood in Section 3.3 of the LAP:

- *CK1: Emergence of a vibrant mixed use residential-led neighbourhood.*
- *CK2: Create new urban block structure.*
- *CK3: Deliver a mix of new open spaces, including provision of a new urban square or plaza at a central location at, or in close proximity to, the junction of Cookstown Road and Second Avenue. The exact location, design and delivery of this space to be progressed by SDCC in discussion with landowners in the area.*
- *CK4: Improve legibility throughout the area and provision of new streets linking to nearby hubs and The Centre.*
- *CK5: Delivery of a variety of building types around Luas stops.*
- *CK6: Support provision of a new primary school if deemed necessary by Department of Education and Science.*
- *CK7: Utilising location as source of River Poddle, incorporating it into public realm and open space and green/blue infrastructure asset strategies.*
- *CK8: Encourage and facilitate higher intensity employment uses and economic development.*
- *CK9: Encourage design proposals to provide appropriate space to accommodate nonresidential uses, particularly for existing businesses in the Cookstown area which can be appropriately accommodated in a mixed-use development with a substantial residential component.*
- *CK10: Explore the feasibility of uplifting the River Poddle and incorporating into public realm, open space and green/blue infrastructure asset strategies as part of proposals for development.*

The following area specific requirements are set out for the CT-D sub-neighbourhood within the Cookstown neighbourhood:

Physical	Upgrade / enhancements required to Cookstown Road in order to facilitate development within CT-C, including public realm improvements, pedestrian, cyclist linkages and potential alternative routing for HGV traffic.	Developer	In tandem with development
	Enhanced pedestrian and cyclist linkages to Belgard Luas Stop.	Developer	In tandem with development
	Removal / undergrounding of 110kv overhead power lines at northern section of Cookstown, linked to proximity and set back required by ESBI on relevant sites.	Developer	In tandem with development
	Provision of Belgard Square North Link Road to facilitate direct link to Town Centre from Central Cookstown.	SDCC	2020-2026
	New secondary route between Cookstown Road and Belgard Road.	Developer	In tandem with development
Open Space	Upgrade and enhancement landscaping works to open space alongside Luas line as part of proposals for development along the northern boundary of CT-C, in consultation with TII and SDCC Parks Department.	Developer	In tandem with development
	Proposals for residential development in this area to provide for the delivery of Cookstown Urban Square, as per the criteria set out in Section 8.4.2, in tandem with development, unless otherwise agreed with the Planning Authority in regard to securing the provision of this open space.	Developer	In tandem with development

3.2.15.3 Plot Ratio, Height and Built Form

Plot Ratio, Height and Built Form (discussed in Section 2.6 of the Draft LAP) will be used to determine and assess the intensity, scale and bulk of development in the Plan lands. The design and layout of each plot will need to take account of its context and be designed accordingly.

<u>*Plot Ratio*</u>

To inform the assessment of each planning application, plot ratio will be used as an important determinant in assessing the intensity of a proposed development. Table 2.0 included in Section 2.6.1 of the LAP sets out a range of appropriate plot ratios across the plan lands. A plot ratio range of 1.5-2.0 was set in relation to the CT-D parcel within the Cookstown Neighbourhood.

> *The plot ratio and building height of any proposed development shall not normally exceed the maximum plot ratio or building height thresholds for any particular site, block or parcel of land. Flexibility in relation to the gross floor area of up to 20% of the plot ratio ranges may generally be applicable where there is a strong design rationale for an increase in density/height and the development will result in a significant public gain. The plot ratio ranges and additional 20% floorspace bonus shall normally be calculated on the basis of the gross site area. A significant public gain includes:*

- *The dedication of part of the site for public open space including parks and plazas, above the standard 10% requirement for public open space on site;*
- *The creation of streets and links that provide access through and access to a site;*
- *Major upgrades to streets surrounding the site including works such as street widening, new enhanced junctions and crossing points and realignments;*
- *Provision of community and/or cultural amenities that will significantly contribute to the social infrastructure in the area; and/or*
- *Other public domain works or improvements to be agreed with the Council.*

<u>*Height*</u>

In general terms, the height strategy included in the Tallaght Town Centre LAP provides for the following:

- *Building height and scale is greatest in the Centre, in close proximity to Luas stops and along arterial and primary route frontages (6–7 storeys Residential, +1 recessed and 5–6 storeys non-residential, +1 recessed).*
- *Building height and scale on secondary routes/frontages is lesser but still within an urban scale, (4–6 storeys Residential, 3–5 storeys non-residential and building height is lower along tertiary routes, within the network of secondary streets).*

As mentioned previously, the subject site is situated within an area known as the 'Cookstown' Neighbourhood Area under the LAP. This area is designated for buildings of 6 to 7 storeys in height along the sites northern boundary and in the south-eastern corner of the site; 4 to 6 storeys along the sites remaining frontage to Old Belgard Road, frontage to Cookstown Road (west) and the development frontage to the east-west link between the Old Belgard Road and Cookstown Road proposed along the subject site's southern boundary; and 3 to 4 storeys elsewhere, as shown in the Overall Urban Structure (Cookstown) Diagram in Figure 3.4 below

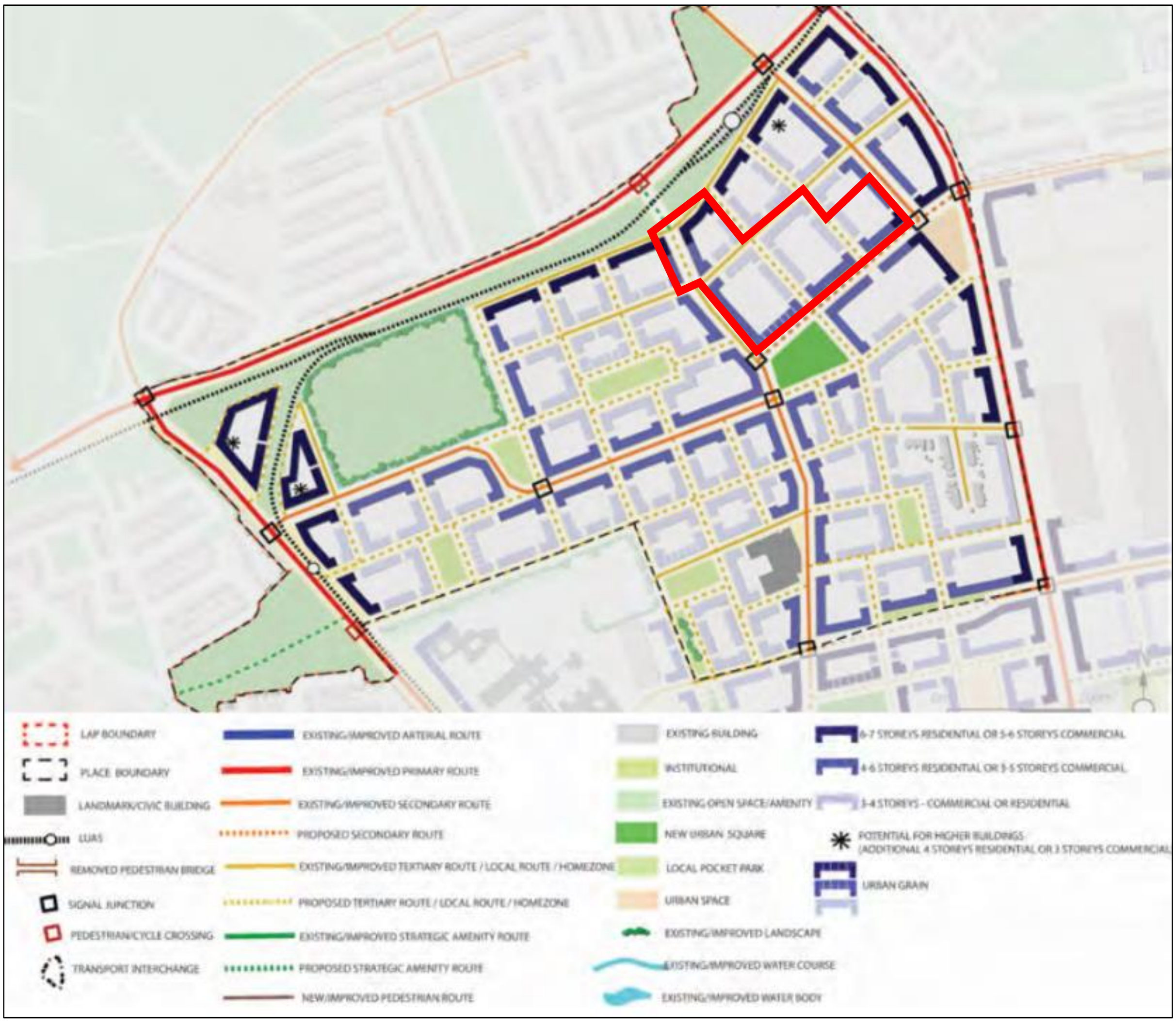


Figure 3.4 Overall Urban Structure Diagram included in Figure 3.3 in Section 3.2 of the LAP (subject site identified with red line

Figure 2.7, included in Section 2.6.2 of the LAP, illustrates the LAP's "Density Strategy" (an excerpt of which is included in Figure 3.5 overleaf). It indicates the subject site with a purple colour due to its proximity to the Belgard Luas stop – the same density designation as that of applied to the Tallaght Town Centre. The purple colour is applied to areas where higher densities are encouraged.

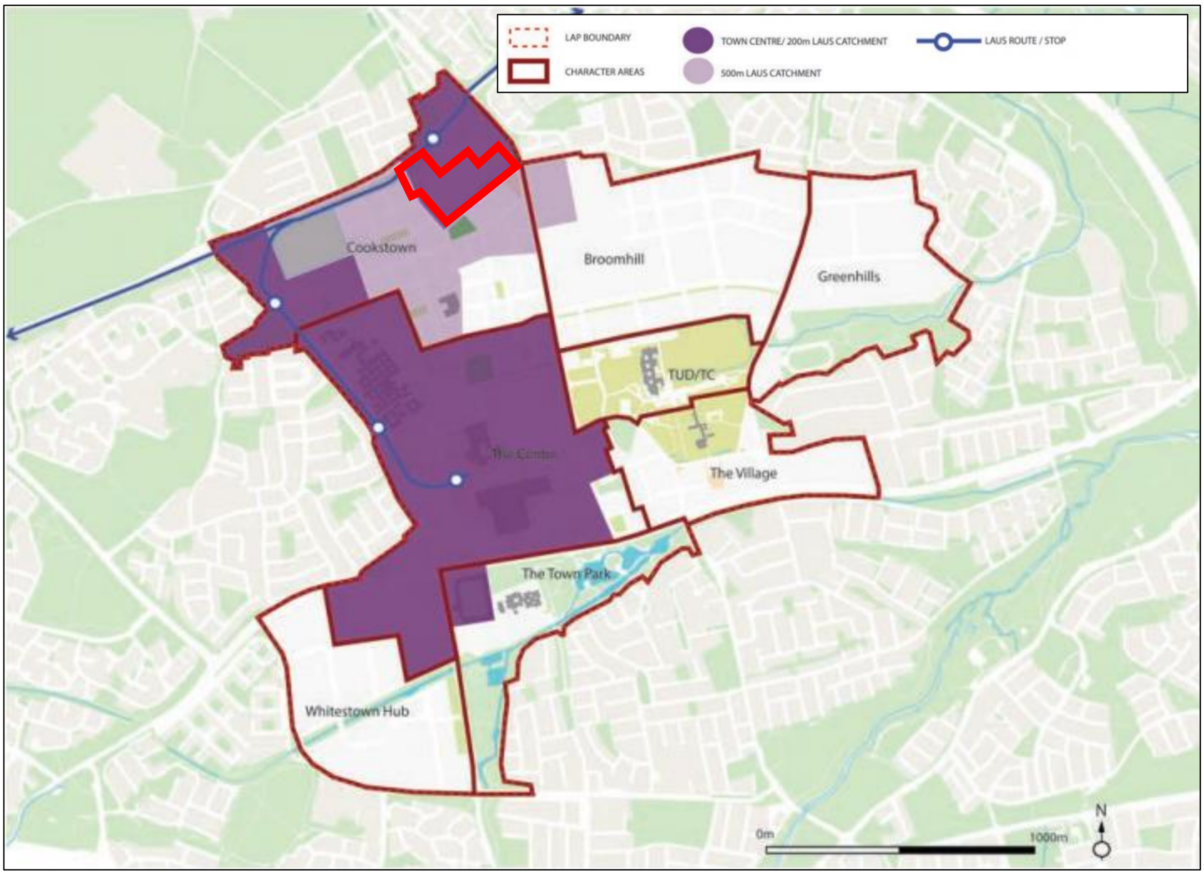


Figure 3.5 Density Strategy included in Figure 2.7 in Section 2.6.2 of the LAP

Section 2.6.2 states the following in relation to 'Landmark Buildings':

In the interest of place making and improving legibility, Landmark Buildings are permissible at key locations that will punctuate urban areas. In general, buildings that exceed the prescribed general buildings heights should only be provided at the locations indicated as having 'Potential for Higher Buildings' in the Building Height Strategy (see Figure 2.4) and at locations adjacent to the key public transport stops and key public spaces identified in Section 2.6.

A 2–4 storey increase on the above typical levels may be considered for key or landmark sites or where sites exceed 2ha in area and can establish its own identity (see Section 8.2 Implementation).

Section 2.6 states:

To reflect the importance of placemaking at key public transport stops and key public spaces, flexibility in relation to the plot ratio range and the potential for higher buildings (2-4 storey increase on typical levels set in the LAP) may be considered at certain locations which are considered to be key or landmark sites, subject to exceptional design which creates a feature of architectural interest, a significant contribution to the public realm at these locations and mixed uses at ground floor level. These requirements are subject to criteria for taller buildings set out in Section 2.6.2. This provision may apply where the site is directly adjacent to the following:

- *High capacity public transport stops (i.e. a Luas stop or high frequency bus stop (i.e. 10-minute peak hour frequency) on a dedicated bus lane);*
- *The proposed 'New Urban Square' north of Belgard Square North in the Centre neighbourhood;*
- *The proposed 'New Urban Square' within the Cookstown neighbourhood; and*
- *The proposed Transport Interchange and adjacent proposed 'Urban Space' in the Centre neighbourhood.*

This provision will only apply to the extent of a site which is within 100m walking distance of the above locations and will only be considered where the Planning Authority is satisfied that provision of the above facilities will be achieved.

The subject site is located immediately north-west of the proposed 'New Urban Square' within the Centre neighbourhood and is directly adjacent to the Belgard Luas Stop as illustrated in the plan excerpt included at Figure 3.4.

3.2.15.4 Street Network and Route Structure

As discussed in Section 2.2.1, the LAP sets out a street network and route structure which provides the basic physical framework for the plan lands and provides a framework for urban blocks and open spaces. Existing and planned streets are classified within a new hierarchy on the basis of their function, context and location. Pedestrian and cycle accessibility and movement are key components of the overall Urban Framework for the Plan. As illustrated, in the plan excerpt included at Figure 3.4 previously, the southern part of the subject site is earmarked for the introduction of a secondary route linking the Old Belgard Road and Cookstown Road and 3 no. tertiary route/local route/homezones, 2 no. centrally on the site and 1 no. along the site's eastern boundary linking Cookstown Road with the Belgard Luas Stop.

3.2.15.5 Block Size and Form

Section 2.6.3 of the LAP sets out policies in relation to block size and form.

Block Size

Section 2.6.3 outlines the following in relation to block size:

Block sizes in the Centre and Cookstown neighbourhood should have dimensions of approximately 60 to 80 metres and shall be no more than 100 metres in length/depth.

Block Form

Section 2.6.3 outlines the following in relation to block form:

New buildings shall be laid out in perimeter blocks across the Plan lands. Such blocks shall be used to enclose private and semi-private open spaces and, depending on the context and demonstration of need, larger blocks or irregular sized blocks may contain small scale development. All perimeter blocks shall be designed according to the following principles:

- *Building massing to the perimeter of the block;*
- *Building frontage to all sides, including the shorter sides (secondary street frontage) of the block;*
- *Proper design and attention to corners, avoiding dead or windowless gables;*
- *A continuity of building frontage, which relates to the local or urban context, and avoidance of blank walls;*
- *An appropriate scale of buildings to provide the appropriate level of enclosure of the streets and spaces;*
- *Adequate back-to-back distances within the block;*
- *Appropriate building setbacks from the street in line with the use of ground floors;*
- *Adequate arrangements for car parking and access around, within or below the block;*
- *Carefully considered subdivision of the block into plots where fine urban grain or mixed use is proposed; and*
- *Appropriate consideration of building height within the block to facilitate adequate levels of sunlight and daylight penetration.*

3.2.15.6 Housing Mix and Options

Section 5.2.1 of the LAP, includes the following policy in relation to housing mix:

It is policy of the Council to ensure an appropriate housing mix is provided within the LAP lands, therefore a minimum of 30% of units within any new residential development (in the form of either apartments or houses, but excluding student accommodation schemes) shall have a minimum of 3 bedrooms.

Section 5.2.2 includes the following policies in relation to housing/occupancy mix:

In the interest of providing an appropriate housing tenure mix it is policy of the Council that all residential development proposals shall state the proposed tenure mix and provide justification for the proposed mix having regard to the socio economic and demographic context of the area. It is an ambition of the LAP to encourage the provision of at least 30% owner occupied units across the LAP area.

This provision will be reviewed pending the completion of a Housing Need and Demand Assessment (HNDA) for the Dublin area.

On sites where a developer demonstrates that 30% private sale/owner occupation units cannot be achieved based on assessment against Plan criteria including viability considerations, an alternative scenario may be considered. However, provision of more than 60% BTR must be accompanied by evidence that the level of BTR provided is justified.

Section 5.2.2 of the LAP also outlines the following policy specifically relating to Build-to-Rent proposals:

It is the policy of the Council to support Build to Rent developments that comply with the housing/occupancy mix requirement specified in this Section and national policy, in particular with the policies and objectives set out in 'Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities (2018)'.

3.2.15.7 Implementation and Sequencing

Section 8.0 of the LAP includes the following objective in relation to implementation and sequencing of development in the LAP area:

It is an objective of the Council that development within the plan area is undertaken in an orderly and sustainable manner. The development of the identified regeneration lands at Cookstown and Broomhill alongside the Town Centre lands should generally be phased in accordance with the sequential approach:

- *Development should extend outwards from the town centre and high-quality public transport with land closest to the centre and public transport nodes being given preference, i.e. 'leapfrogging' to stand alone or isolated areas should be avoided; and*
- *A strong emphasis will be placed on encouraging infill opportunities adjacent to compatible existing uses and ensuring better use of under-utilised lands;*

Only in exceptional circumstances should the above principles be contravened, for example, where a barrier to development is involved or where proposals are brought forward for sites approximately 2 Hectares and above, particularly within the regeneration lands that comply with the Urban Framework of the LAP, the Planning Authority may consider that the proposal can establish its own identity and amenity in the transition phase of the area.

The following implementation design criteria are set out, in Section 8.2.1, in relation to sequencing of development in Regeneration Zoning:

1. *Demonstrate a clear transition towards a more urban form of development and a traditional street network in accordance with Chapter 2 and 3;*

2. *Address connectivity and linkages in the area and demonstrate that the development of the site would not give rise to isolated piecemeal pockets of development with residential uses that are disconnected from public transport, public realm, retail, amenities and/or other residences;*
3. *Residential development should be very carefully designed at the lower levels in particular adjacent to existing busy roads, and/or roads that are subject to significant movements by Heavy Goods Vehicles (HGVs) without demonstrated or proposed improvements to upgrade the street network in accordance with the Plan;*
4. *Demonstrate that the potential for noise pollution, air pollution or other nuisance from established industrial uses will not exceed acceptable environmental standards. The Planning Authority may seek a report from a suitably qualified person to identify and quantify sources of noise pollution, air pollution, or nuisance, assess the potential impacts on the proposed development and provide a series of recommendations to mitigate the impacts of any pollutants insofar as possible (e.g. orientation and layout of dwellings, positioning of openings and insulation); and*
5. *As part of any planning application for redevelopment, the developer shall demonstrate a rationale for the site selection of the proposed development in relation to existing, permitted and proposed development. In general, integration with adjoining development and/or the urban form of the established Centre will be required to prevent piecemeal or premature development. Developers should sequence the delivery of Cookstown radially from the Town Centre, Luas stops and the perimeter.*

3.3 Planning History of the Site

A review of South Dublin County Council's online planning register revealed no applications lodged in respect of the subject site as a whole. A review of the South Dublin Council's online planning register did reveal one application lodged in respect of part of the subject site (Circle K Belgard site), details of which are as follows:

Reg. Ref. SD19A/0259 Permission was granted by South Dublin County Council on 10th October 2019 for (i) Change of use from retail use to retail use with ancillary off-licence use; (ii) associated alteration of existing retail unit; (iii) all associated site and development works.

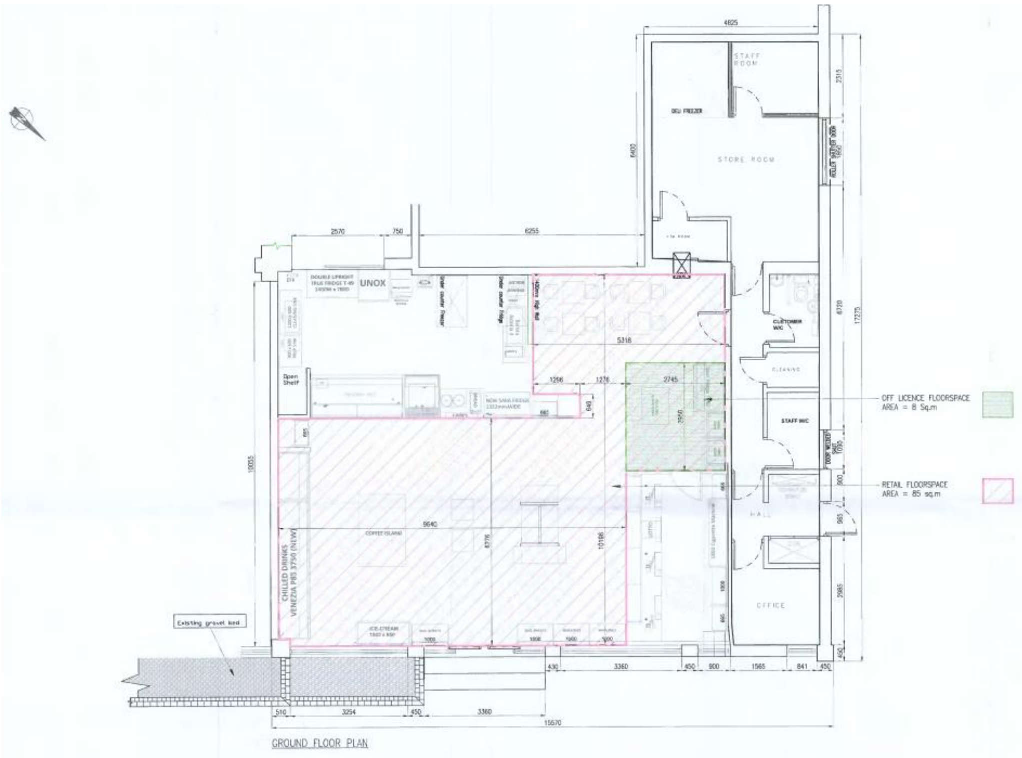


Figure 3.6 Ground floor plan of the development approved under Reg. Ref. SD19A/0259

3.4 Planning History of the Cookstown Industrial Estate

A review of the South Dublin County Council and An Board Pleanála's planning registers revealed a no. of applications on the land in the Cookstown Industrial Estate, more broadly. Their location relative to the subject site are illustrated in Figure 3.7 and details of the planning applications are provided overleaf.

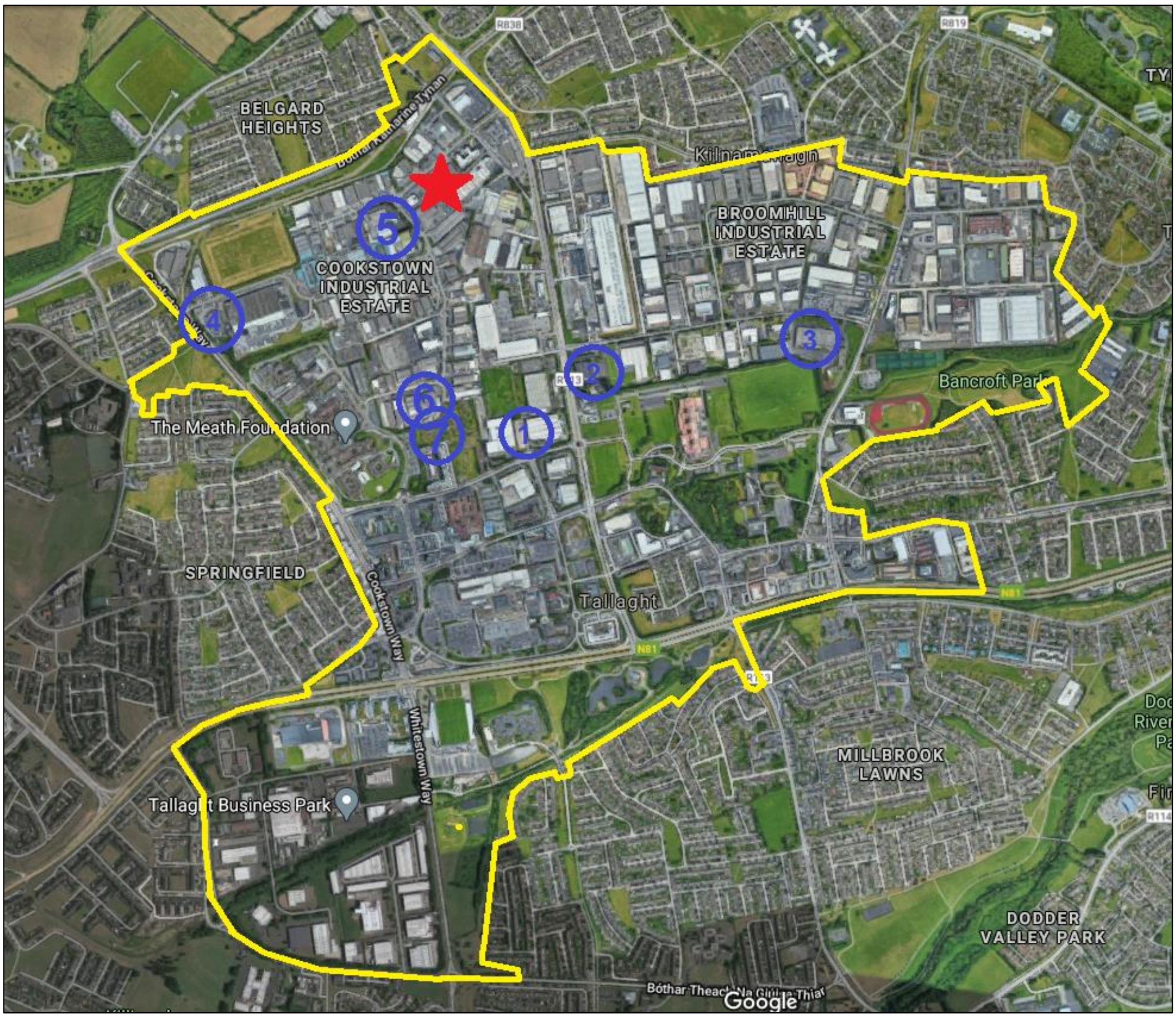


Figure 3.7 Planning applications recently considered or currently being considered in the Tallaght Town Centre Area (subject site indicated with red star)

The planning applications illustrated in Figure 3.6 above are discussed in more detail below and overleaf:

Belgard Gardens, Belgard Square North and Belgard Road, Tallaght, Dublin 24 (Site No. 1 on map at Figure 3.7)

ABP Case No. 303306-18 Permission was granted by An Board Pleanála on 15th April 2019 for a Strategic Housing Development on lands at Belgard Gardens, Belgard Square North and Belgard Road, Tallaght, Dublin 24 (immediately east and south-east of the subject site). In summary, the proposed Strategic Housing Development involves demolition of all existing buildings and construction of a mixed use residential development (total GFA 55,180 sqm) comprising a new urban quarter and streets with 5 no. blocks to provide 438 no. apartment units (including live/work units) and associated amenity facilities, a 403 no. bedspace student accommodation scheme and associated amenity facilities, childcare facility (c.380 sqm), 6 no. retail / commercial units (c.632 sqm in total) and a security room (c.52 sqm). This will comprise phase I of the overall development of the c.7.2 ha. site and will be located on a net site area of 3.45 ha. (excluding proposed temporary car park at grade).

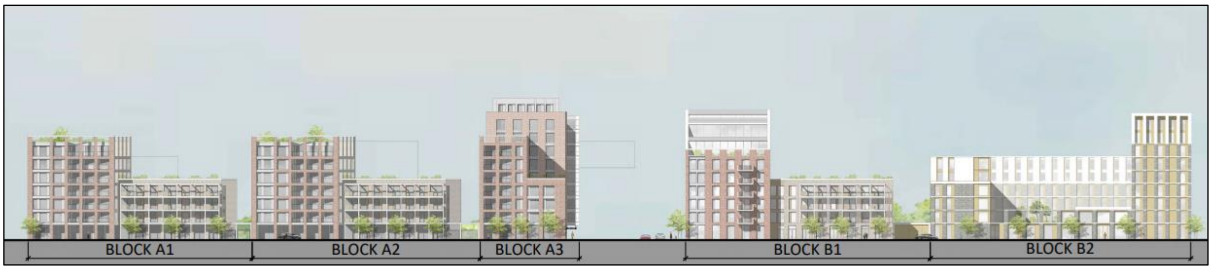


Figure 3.8 South contextual elevation of development proposed under An Bord Pleanála Case No. 303306

Figure 3.9 Site layout plan of development approved under An Bord Pleanála Case No. 303306-18 including the second phase of development which is to follow

Figure 3.10 Site layout plan approved under An Bord Pleanála Case No. 303306-18

This planning permission remains in force until July 2029 and sets a precedent for the construction of suitably designed residential developments in this area.

Site at the corner of Airton Road and Belgard Road, Tallaght, Dublin 24 (Site No. 2 on map at Figure 3.7)

ABP Ref. ABP-305763-19 Permission was granted by An Board Pleanala on 20th February 2020 for a Strategic Housing Development on a site at the corner of Airton Road and Belgard Road, Tallaght, Dublin 24. In summary, the proposed Strategic Housing Development involves demolition of the existing industrial buildings on site and the construction of 2 no. blocks comprising 328 no. apartments (93 no. 1 bed, 222 no. 2 bed and 13 no. 3 bed), ancillary residential support facilities and commercial floorspace measuring 31,147sq.m gross floor space above a single basement level measuring 5,861sq.m.

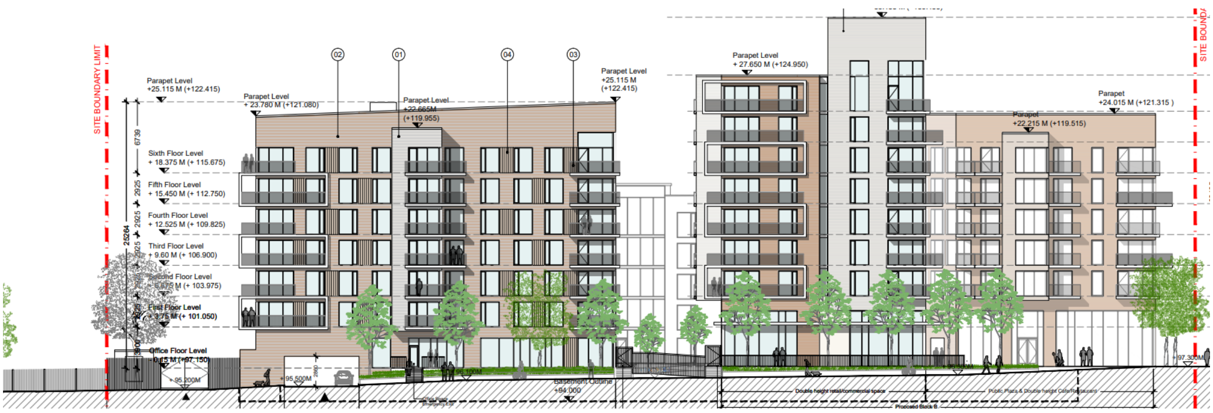


Figure 3.11 Northern elevation (fronting Airton Road) approved under ABP Ref. ABP-305763-19

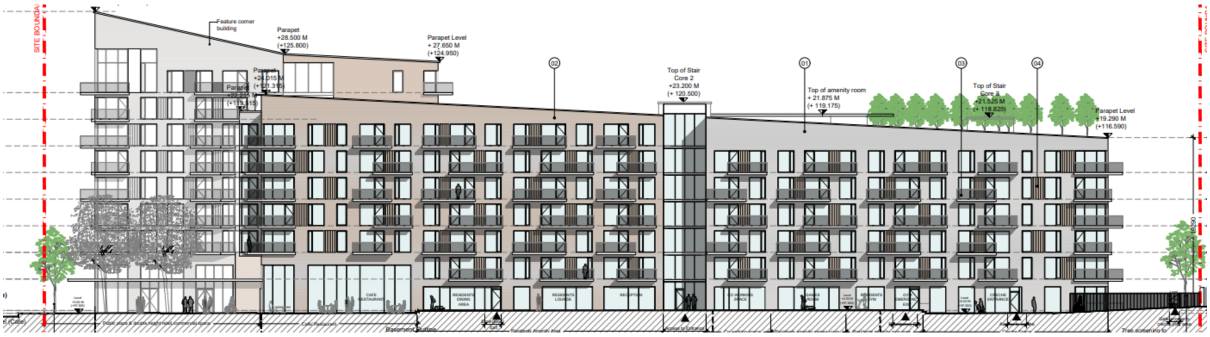


Figure 3.12 Western elevation (fronting Belgard Road) approved under ABP Ref. ABP-305763-19

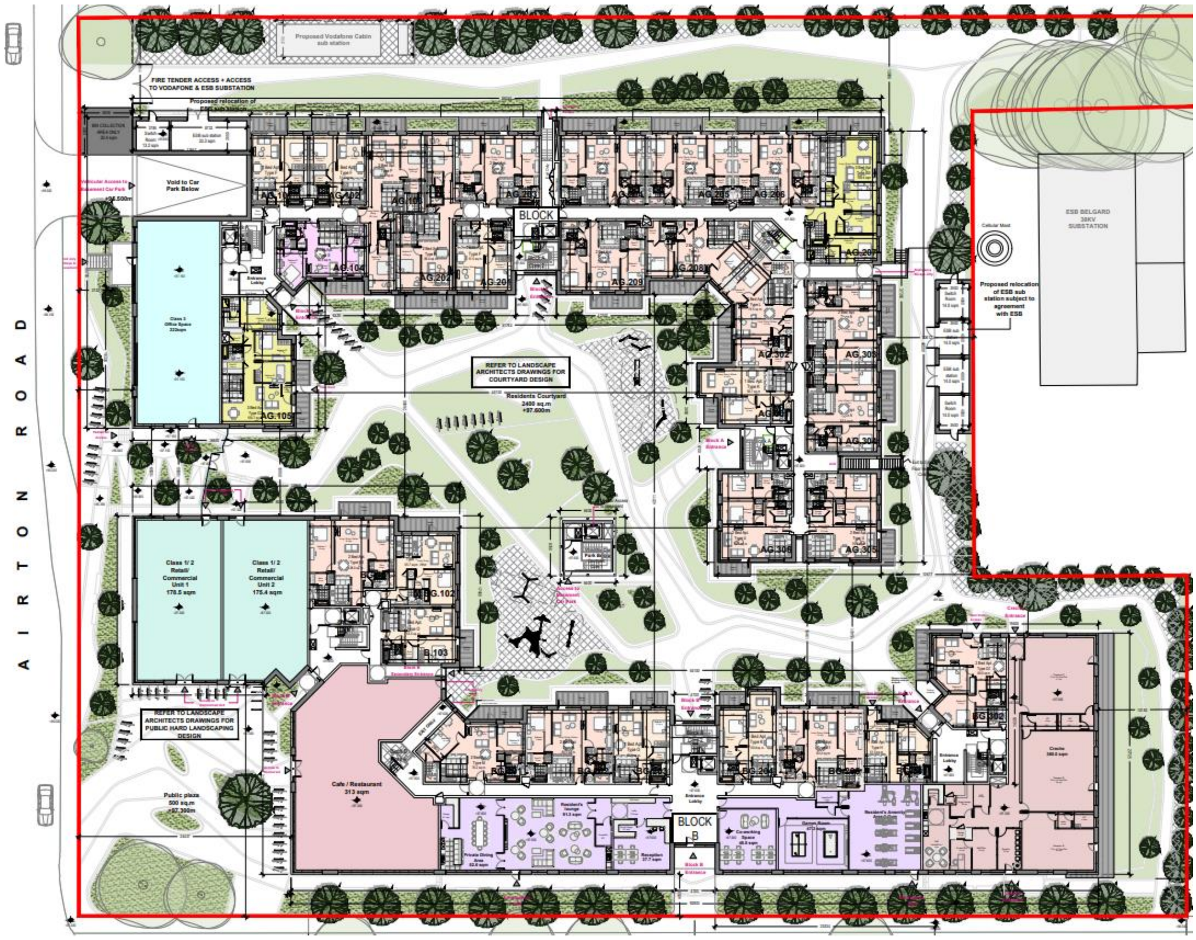


Figure 3.13 Ground floor layout plan approved under ABP Ref. ABP-305763-19

This planning permission remains in force until 2025 and sets a precedent for the construction of suitably designed residential developments in this area.

Former Gallaher's Cigarette Factory Site at the junction of Airton Road & Greenhills Road, Tallaght, Dublin 24 (Site No. 3 on map at Figure 3.7)

ABP Ref. ABP-306705-20 Permission was granted by An Board Pleanala on 16th June 2020 for a Strategic Housing Development at the Former Gallaher's cigarette factory site at the junction of Airton Road & Greenhills Road, Tallaght, Dublin 24. In summary, the proposed Strategic Housing Development involves: demolition of existing factory/warehouse buildings on site; construction of 502 no. apartments (comprising 197 no. 1-bed; 257 no. 2-bed; and 48 no.

3-bed units) within 6 no. blocks ranging in height from 4 to 8 storeys, 3 no. retail units, creche, and provision of road improvements and pedestrian crossings; and all associated site development works and services provision.

Figure 3.14 Contextual Site Elevation (Greenhills Road) approved under ABP Ref. ABP-306705-20

Figure 3.15 Contextual Site Elevation (Airton Road) approved under ABP Ref. ABP-306705-20

Figure 3.16 Ground floor layout plan approved under ABP Ref. ABP-306705-20

Figure 3.17 First floor layout plan approved under ABP Ref. ABP-306705-20

This planning permission remains in force until 2025 and sets a precedent for the construction of suitably designed residential developments in this area.

Unit 5A-C Second Avenue, Cookstown Industrial Estate, Tallaght, Dublin 24 (Site No. 4 on map at Figure 3.6)

ABP Ref. ABP-303803-19 Permission was granted by An Board Pleanala on 25th July 2019 for a Strategic Housing Development Unit 5A-C Second Avenue, Cookstown Industrial Estate, Tallaght, Dublin 24. In summary, the proposed Strategic Housing Development involves demolition of the existing industrial building and construction of a ‘build-to-rent’ housing development providing a total of 196 no. residential apartments (comprising 45 no. studio units, 48 no. one-bed units, 8 no. two-bed (3-person) units and 95 no. two-bed (4-person) units) in 4 no. six-nine storey blocks over basement. The development also includes 1 no. commercial unit (248sqm), 1 no. office unit (111sqm), a crèche (192sqm) and a gym (18sqm).

Figure 3.18 Ground floor plan of development approved under ABP Ref. ABP-303803-19

Figure 3.19 Western elevation (fronting onto Cookstown Way) of development approved under ABP Ref. ABP-303803-19

Figure 3.20 Northern elevation (fronting onto Second Avenue) of development approved under ABP Ref. ABP-303803-19

This planning permission remains in force until July 2024 and sets a precedent for the construction of suitably designed residential developments in this area.

Unit 21 First Avenue, Cookstown Industrial Estate, Dublin 24 (Site No. 5 on map at Figure 3.6)

ABP Case No. 303911-19 A planning application for a Strategic Housing Development was refused by An Board Pleanála on 19th June 2019 at Unit 21 First Avenue, Cookstown Industrial Estate, Dublin 24. In summary, the proposed development involved demolition of 5,500 sqm of existing 1 and 2 storey industrial buildings (including a small operating café) and associated site clearance works, and the construction of 150 'Build-to-Rent' apartments in 3 no. 5-6 storey blocks and 222 no. Shared Living units in a fourth 6-8 storey (parapet level) block. The proposal provides for a total of 725 bedspaces. The proposed development will include a retail/café unit of 92 sqm, 64 no. car parking spaces at grade, communal, public and private open space and communal resident facilities and services, a total of 488 no. sheltered bike parking spaces split into each block and an additional 98 no. visitor bike parking spaces at grade. An upgrade to the public realm, to include cycle paths and footpaths, along First Avenue and Cookstown Road adjoining the site, is also proposed.

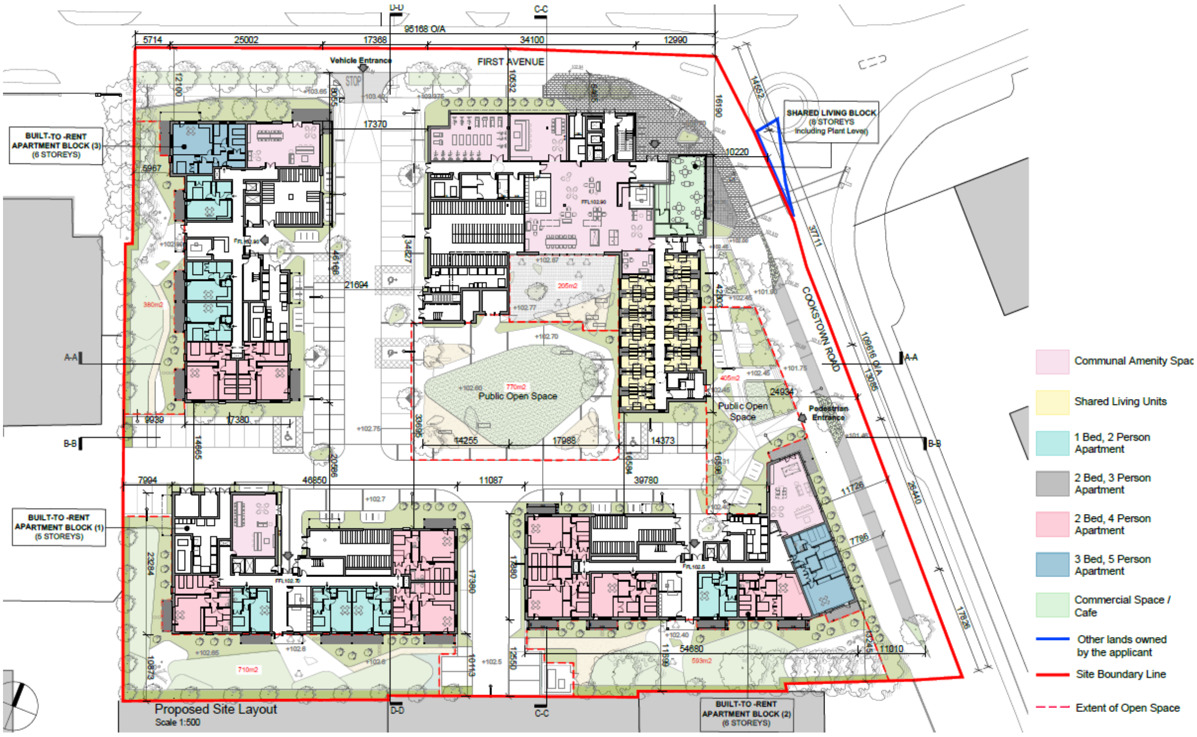


Figure 3.21 Site layout plan of the development proposed under An Bord Pleanála Case No. 303911-19

Figure 3.22 Cookstown Road contextual elevation of the development proposed under An Bord Pleanála Case No. 303911-19

Figure 3.23 First Avenue contextual elevation of the development proposed under An Bord Pleanála Case No. 303911-19

An Board Pleanála refused this application for the following reasons:

1. *Having regard to the location of the subject site within the existing Cookstown Industrial Estate, to the established build form, uses and character of the industrial estate surrounding the site, particularly along First Avenue and Cookstown Way, and having regard to the location of the subject site at a remove from the town centre of Tallaght, it is considered that the development*

of a residential use at this location, in the absence of an overall strategy for the re-development of the industrial estate, and in the absence of the realisation of planned direct vehicular, and convenient cyclist and pedestrian links, to the town centre and to public transportation, would represent an uncoordinated and haphazard form of development which would give rise to an isolated piecemeal pocket of residential development that is disconnected from shops, amenities and/or residential services, contrary to section 11.2.4 of the current South Dublin County Development Plan 2016 – 2022, and would not be in accordance with an appropriate sequential development of these Regeneration (REGEN) zoned lands as a whole. The proposal would, therefore, not represent a "plan-led" residential development, would be contrary to the provisions of the statutory Development Plan, and would be contrary to the proper planning and sustainable development of the area.

2. *It is considered that the format proposed for the shared accommodation development, with significant numbers of individual units sharing a single common living/kitchen area on each floor, and with a notable shortfall in the quantitative and qualitative provision of sufficient communal facilities, would fail to provide an acceptable living environment for future residents of the development, contrary to the Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities, issued by the Department of Housing, Planning and Local Government in March 2018, and particularly paragraphs 5.15, 5.22 and 5.23 of these Guidelines. The proposed shared accommodation development would, therefore, be contrary to these Ministerial Guidelines and would seriously injure the residential amenities of future occupants/residents, and accordingly would be contrary to the proper planning and sustainable development of the area.*

Although proximate to this site, the subject proposal differs from the proposal refused at Unit 21 First Avenue. Firstly, the subject proposal does not include shared accommodation. Secondly, the subject proposal provides a direct link to the Belgard Luas Stop immediately north-east and includes shops, amenities and residential services to serve residents of the development and the surrounding area more broadly. Further to this, the subject site is much larger in size than that involved in application ABP Ref. 303911-19 and capable of establishing a self-sustaining neighbourhood with its own character. The subject proposal also includes road, junction and streetscape upgrades which will see the existing industrial setting being replace with a more residential environment. Given the above, we would argue that the above reasons for refusal are not applicable in relation to the subject proposal.

Units 66 & 67 Fourth Avenue, Cookstown Industrial Estate, Dublin 24 (Site No. 6 on map at Figure 3.7)

<u>Application No. 1</u>

ABP Ref. ABP-305725-19

Permission was refused by An Board Pleanala on 13th February 2020 for a Strategic Housing Development at Units 66 & 67 Fourth Avenue, Cookstown Industrial Estate, Dublin 2. The proposed development, as per the description contained within the statutory planning notices, was for: (i) Demolition of the existing industrial buildings (2,518sq.m); (ii) construction of a 'build-to-rent' housing development providing a total of 245 no. residential apartments (comprising 69 no. studio units, 56 no. one-bed units and 120 no. two-bed units) in a six to eleven storey building over basement. Each apartment has associated private open space in the form of a ground floor terrace or a balcony and has access to 21 no. communal amenity spaces (totalling 880sqm), including a communal gym (82.5sqm), and a ground floor level landscaped courtyard. The development is served by an underground carpark (accessed from the Cookstown Road extension currently under construction) providing a total of 79 no. parking spaces (including 75 no. standard spaces and 4 no. mobility impaired user parking spaces), and 468 no. bicycle spaces (388 no. resident spaces at basement level and 80 no. visitor spaces at ground floor level in the central courtyard and on street); (iii) 2 no. commercial units (comprising 129.4sqm and 126.5sqm and accommodating Class 1, 2 and 8 uses as per the Planning and Development Regulations, 2001-2019, as amended) at ground floor level; and (iv) associated site and infrastructural works are also proposed which include: foul and surface water drainage; attenuation tanks; lighting; landscaping; boundary fences; plant areas; ESB substations; internal hard landscaping, including footpaths and street furniture; and all associated site development works.

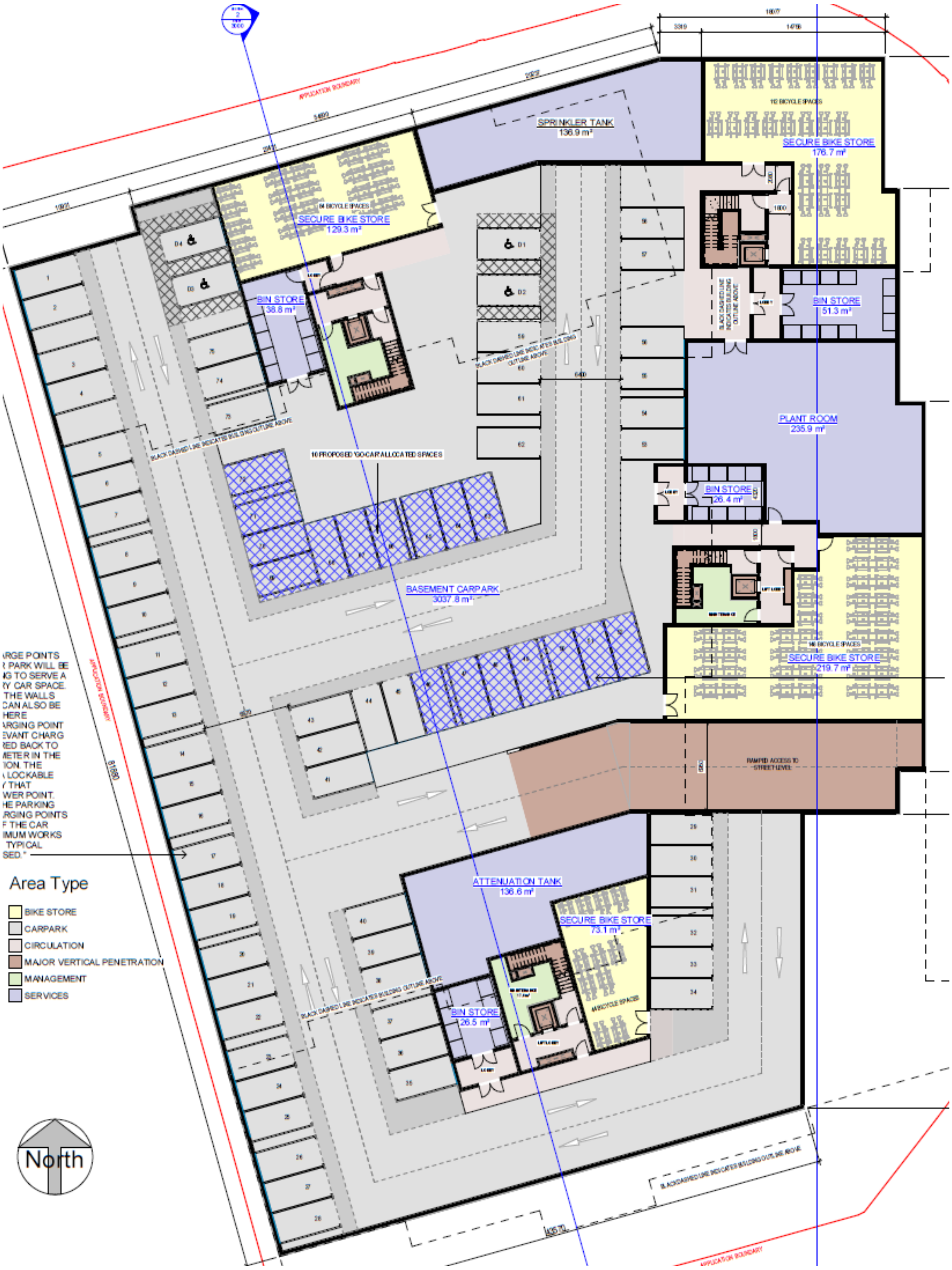


Figure 3.24 Basement plan of proposed development under ABP Ref. ABP-305725-19

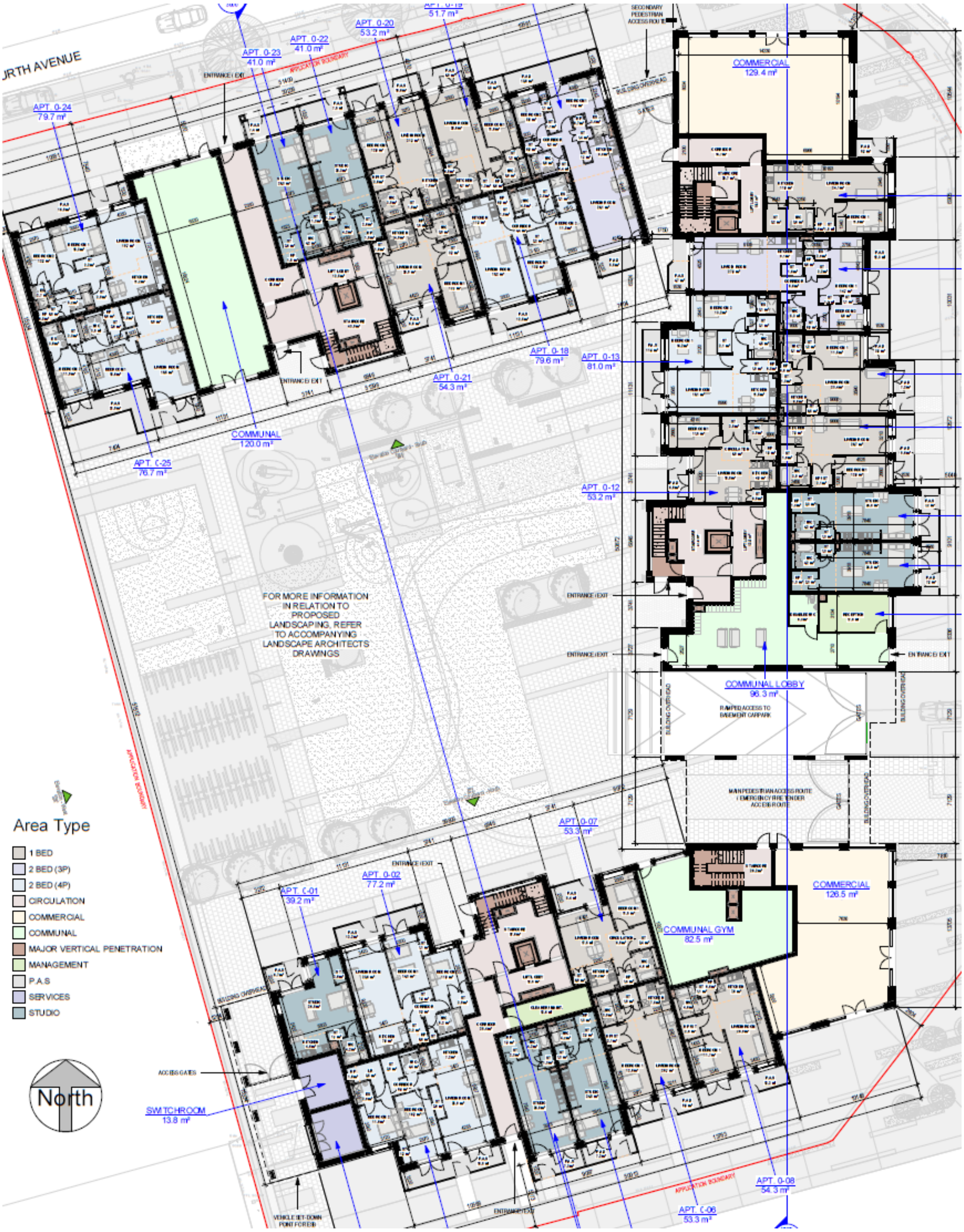


Figure 3.25 Ground floor plan of proposed development under ABP Ref. ABP-305725-19

Figure 3.26 Typical upper floor plan of proposed development under ABP Ref. ABP-305725-19

Figure 3.27 Contextual elevation of the eastern interface of proposed development under ABP Ref. ABP-305725-19

Figure 3.28 Contextual elevation of the northern interface of proposed development under ABP Ref. ABP-305725-19

Application No. 2

ABP Ref. ABP-308398-20

An Board Pleanala recently considered a planning application for a Strategic Housing Development at Units 66 & 67 Fourth Avenue, Cookstown Industrial Estate, Dublin 2. The proposed development, as per the description contained within the statutory planning notices, was for: (i) Demolition of the existing industrial buildings (2,518sq.m); (ii) construction of: (a) 252 no. 'build-to-rent' apartments (comprising 50 no. studios, 96 no. one-bed apartments; 100 no. two-bed apartments and 6 no. three-bed apartments) in a two to nine storey development. Each apartment has associated private open space in the form of a ground floor terrace or a balcony and has access to 613sqm of internal communal amenity space (including a concierge and management facilities, communal gym, flexible meeting rooms, library/co-working space, lounge, cinema/multimedia room and external covered game area); 1792sqm of external communal amenity space at first and second floor levels; and a 65sqm external covered communal amenity area at first floor level. The development is served by an under-croft carpark accessible from the south-western corner of the site providing a total of 73 no. parking spaces (including 58 no. standard spaces, 10 no. go-car spaces and 5 no. mobility impaired user parking spaces) and 500 no. bicycle spaces at ground floor level (372 no. resident spaces and 128 no. visitor spaces); and (b) 2 no. commercial units (comprising of a 95sqm unit accommodating a café/restaurant and a 145sqm unit accommodating Class 1, 2 and 8 uses as per the Planning and Development Regulations, 2001-2019, as amended) and a 275sqm crèche, with associated 86sqm play area, at ground floor level; (iii) road, junction and streetscape upgrade works along Fourth Avenue and Cookstown Road, including the installation a signalized junction at the intersection of Fourth Avenue and Cookstown Road; (iv) Construction of a temporary access road along the southern site boundary; and (v) associated site and infrastructural works are also proposed which include: foul and surface water drainage; attenuation tanks; lighting; landscaping; boundary treatment; plant areas; ESB substations; and all associated site development works.

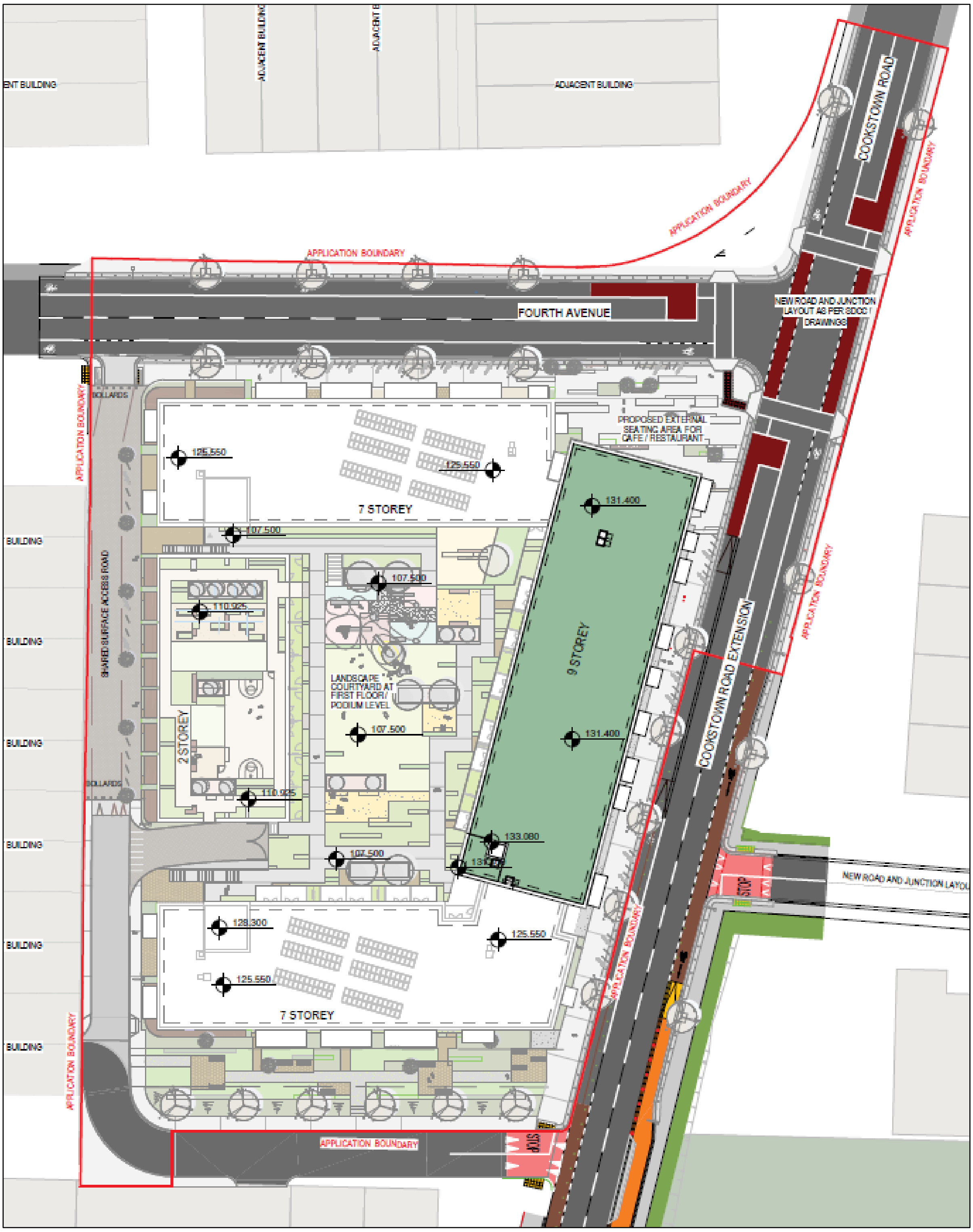


Figure 3.29 Site layout plan of proposed development under ABP Ref. ABP-308398-20

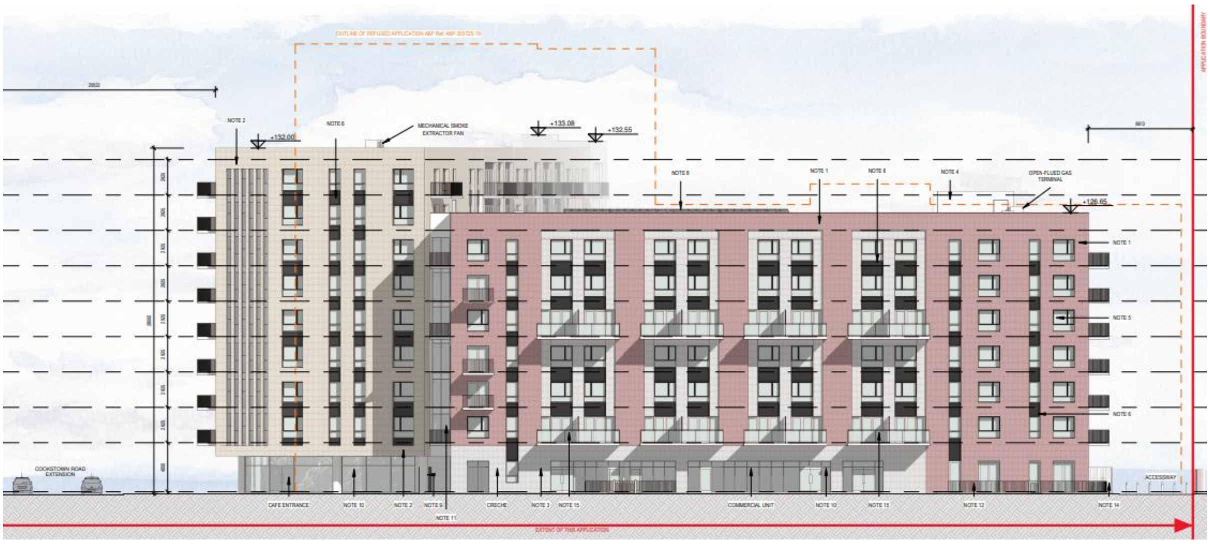


Figure 3.30 Northern elevation of the proposed development under ABP Ref. ABP-308398

Figure 3.31 Eastern elevation of the proposed development under ABP Ref. ABP-308398

An Bord Pleanala granted planning permission on 28th January 2021, subject to 30 no. conditions, including Condition No. 2 which required changes to the building height of Blocks A and B and the relocation of the proposed creche.

In recommending the planning application be granted permission as lodged, the Inspectors Report included the following positive commentary regarding the scale and density of the proposed development and the suitability of the area for 'Build-to-Rent' apartments:

> *10.1.16 …..Chapter 2 of the Design Standards for New Apartments Guidelines, 2020 notes that it is necessary to significantly increase housing supply, and City and County Development Plans must appropriately reflect this and that apartments are most appropriately located within urban areas, and the scale and extent should increase in relation to proximity to public transport as well as shopping and employment locations. The apartments guidelines identify accessible urban locations as sites within a reasonable walking distance (i.e. up to 10 minutes or 800 - 1,000m) to / from high capacity urban public transport stops, such as DART or Luas. Having regard to the sites location, approx. 600m from the Hospital and Tallaght Luas stop and its proximity to urban centres, employment locations and urban amenities it is my opinion that the proposed development complies with national guidance for increased scale and density.*

> *10.2.4. The aim of both Objective RE3 and RE4 is to support an appropriate balance of tenure in the LAP area. Having regard to the recently approved 'Build to Sell' residential schemes in the vicinity of the site, as outlined above in Planning History, and the traditional housing*

stock within the vicinity of the site, it is my view that the proposed BTR scheme, which would provide a professionally managed scheme, is acceptable in this instance and would contribute to the mix of tenure within the LAP area. While the ambition of the LAP to increase the provision of owner-occupied units is acknowledged, this is not a policy of the plan. Therefore, it is my view that the proposed contravention of the LAP with regard housing tenure would not be a material.

10.2.9. In conclusion, having regard to the sites location in close proximity to large employment and education centres, services and facilities within Tallaght Town Centre and to public transport, it is my view that the proposed Build to Rent scheme is appropriate in this instance as it would provide an additional housing tenure in the wider Tallaght area which is professionally managed and would support the provision of long-term residents

Belgard Square North, Tallaght, Dublin 24 (Site No. 7 on map at Figure 3.7)

Reg. Ref. SD208/0007 South Dublin County Council have made an application under Part 8, Article 81 of the Planning and Development Regulations, 2001 (as Amended), in relation to a site at Belgard Square North, Tallaght, Dublin 24 for the: construction of 133 affordable rental apartments with a community facility (c.12,918sq.m) in three blocks ranging from three to eight storeys with associated balconies/ terrace for each apartment and roof mounted solar panels linked by a single storey podium.

Figure 3.32 Site layout plan of proposed residential development under Reg. Ref. SD208/0007

A decision is due on this application in early 2021.

3.5 Conclusion

The proposed development is consistent with national, regional and local planning polies for the following reasons:

- The subject proposal involves the redevelopment of a large serviced and well-connected underutilised brownfield site in an existing built-up area which is identified for 'regeneration' in the South Dublin County Development Plan 2016-2022.
- The 'sustainable transport' focus adopted in the context of the proposed development's design is consistent with national planning policy which encourages reduced car parking provision in central areas such as this which are well served by public transport.
- The proposed development has been designed having regard to the Tallaght Town Centre Local Area Plan 2020-2026, the proposed development adopting mixed use frontages; incorporating a variety of new open spaces; improving legibility throughout the area through the introduction of a new block structure and the creation of new streets and a pedestrian/cycle link to the Belgard Luas Stop; and introducing a series of buildings, which adopt varying heights and feature a rich palette of materials and finishes, and create visual interest.
- The proposed development is consistent with the requirements outlined for apartments in the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities (2018), and provides numerous amenity spaces (both internal and external) across the site to serve residents, consistent with the requirements specific to Build-to-Rent developments.
- The proposed development will result in a highly accessible and sustainable modern high-quality urban residential neighbourhood, as sought by the Tallaght Town Centre Local Area Plan 2020-2026, due to the design/quality of the development proposed as well as the employment opportunities existing in the surrounding area and the sites proximity to multiple public transport services, the Tallaght Town Centre and a public open space area proposed immediately south-east under the Tallaght Town Centre Local Area Plan 2020-2026.

Further to the above, the proposed development has had regard to the emerging character of the Cookstown Industrial Estate and will sit comfortably in this emerging area adjacent to the Belgard Luas Stop.

As previously mentioned, an assessment of the proposed development against the relevant policies and objectives is provided in the Statement of Consistency and Planning Report, prepared by Hughes Planning and Development Consultants, which accompanies the planning application.

4.0 POPULATION AND HEALTH

4.1 Introduction

This section of the EIAR has been prepared by Hughes Planning and Development Consultants. More specifically, this chapter of the EIAR was prepared jointly by Mr. Kevin Hughes, Director, and Ms. Margaret Commane, Associate with Hughes Planning and Development Consultants.

Mr. Kevin Hughes of Hughes Planning and Development Consultants, graduated from University College Dublin (UCD) with a Masters in Regional and Urban Planning (MRUP) in 2002, having previously completed a Bachelor of Arts Degree in Sociology from National University of Ireland in 1999. Kevin has over 18 years professional experience in the field of planning and development consultancy, which has included providing consultancy services in respect of several major urban regeneration projects including EIA. Kevin is currently the Director of Hughes Planning and Development Consultants.

Ms. Margaret Commane of Hughes Planning and Development Consultants, graduated from University College Cork (UCC) with a Masters in Planning and Sustainable Development (MPLAN) in 2012, having previously completed a Bachelor of Arts Degree in Geography and Legal Science from National University of Ireland in 2010. Margaret has over 7 years professional experience in the field of planning and development consultancy, which has included providing consultancy services in respect of several major urban regeneration projects including EIA. Margaret is currently an Associate in the Practice of Hughes Planning and Development Consultants.

According to European Commission's Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (2017), human health is:

> *'a very broad factor that would be highly project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population.'*

This section of the EIAR assesses the impact of the proposed development on the human environment in the general area of the subject site at Cookstown Road, Cookstown Industrial Estate, Tallaght, Dublin 24, in terms of population levels; employment and economic activity; land use and settlement patterns; housing; community infrastructure and social facilities; health and safety; and risk of major accidents and disasters.

This chapter addresses potential impacts of the proposed mixed-use development at Cookstown Road, Cookstown Industrial Estate, Tallaght, Dublin 24, on population and human health. Potential impacts of this proposal on population and human health arising from traffic and transportation, air quality and climate, noise and vibration, visual amenity and material assets: utilities and the risk of major accidents and/or disasters are dealt with in the specific chapters in this EIAR dedicated to those topics.

4.2 Methodology

At the time of writing there is no guidance from the EU Commission on the 2014 EIA Directive to indicate how the new term 'Human Health' should be addressed. Therefore, this chapter of the EIAR document has been prepared with reference to recent national publications which provide guidance on the 2014 EIA Directive including Draft Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA in August 2017.

To establish the existing receiving environment / baseline, several site visits were undertaken to appraise the location and likely and significant potential impact upon human receptors. Further to this, a desk top study of a number of relevant policy documents and data sources was carried out, including: Central Statistics Office Census data; the ESRI Quarterly Economic Commentary; the Regional Spatial and Economic Strategy for the Eastern and Midlands Regional Assembly; the South Dublin County Development Plan 2016-2022 and Tallaght Town Centre Local Area Plan 2020-2026.

4.3 Population

4.3.1 Receiving Environment (Baseline Scenario

The subject site is located in the north of Cookstown Industrial Estate, therefore, the population to the south, west and east are minimal due to the presence of the Cookstown and Broomhill Industrial Estates which mostly comprise large industrial or retail units. Lands immediately to the north and north east contain two large housing estates – the Belgard and Kingswood Residential Estates.

The subject site is located within the Electoral Division of Tallaght Springfield (Electoral Division No. 03039), which, according to the Census had a population of 11,012 no. persons in 2016. This represents a population percentage change of 20.7% or an actual population increase of 1,889 no. people from the 2011 Census figures.

From the census figures, it can be gathered that the population in the vicinity of the proposed development has increased over recent intercensal periods. Within the catchment area, the population growth levels have been very disparate, however, Table 4.1 shows the population growth within the Electoral Division (EDs) for Tallaght Springfield, the settlement of Tallaght, South Dublin County and Ireland as a whole. Tallaght and South Dublin County showed large growth patterns over the last two intercensal periods. This can be attributed to the location of the Red LUAS line connecting Tallaght to Dublin as well as the presence of employers such as Technical University Tallaght and Tallaght Hospital among others.

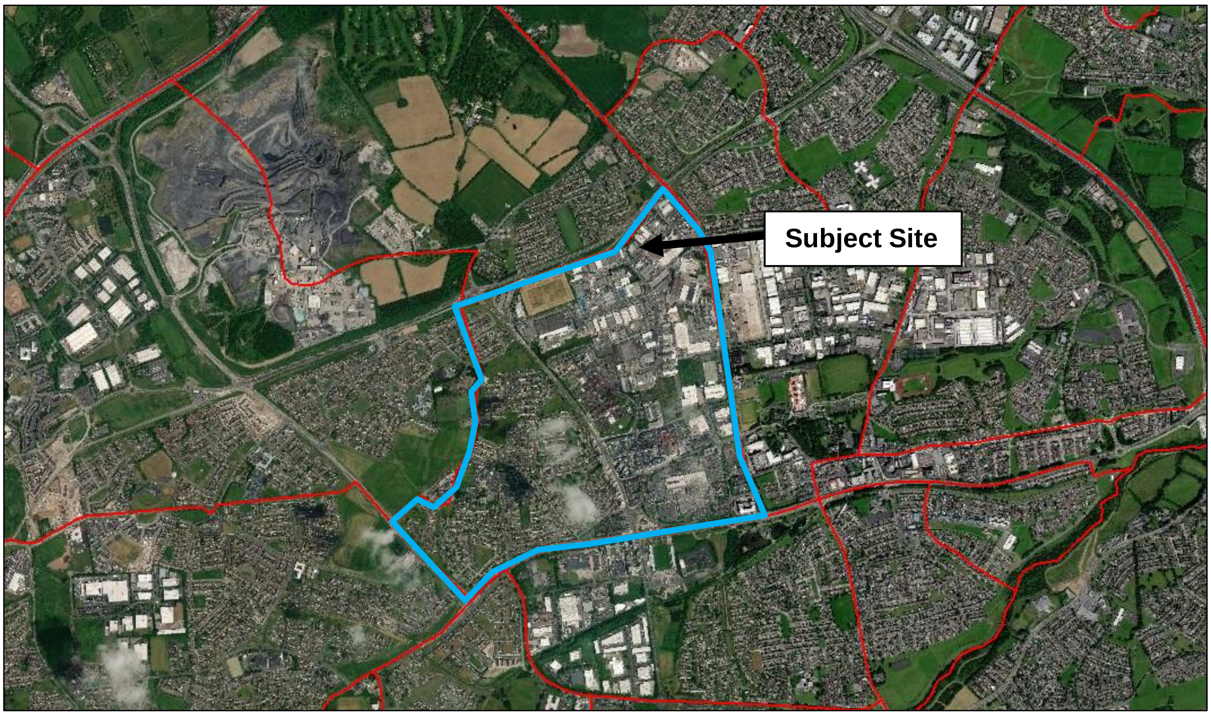


Figure 4.1 Location of subject site in context of the Electoral Division of Tallaght Springfield (outlined in blue)

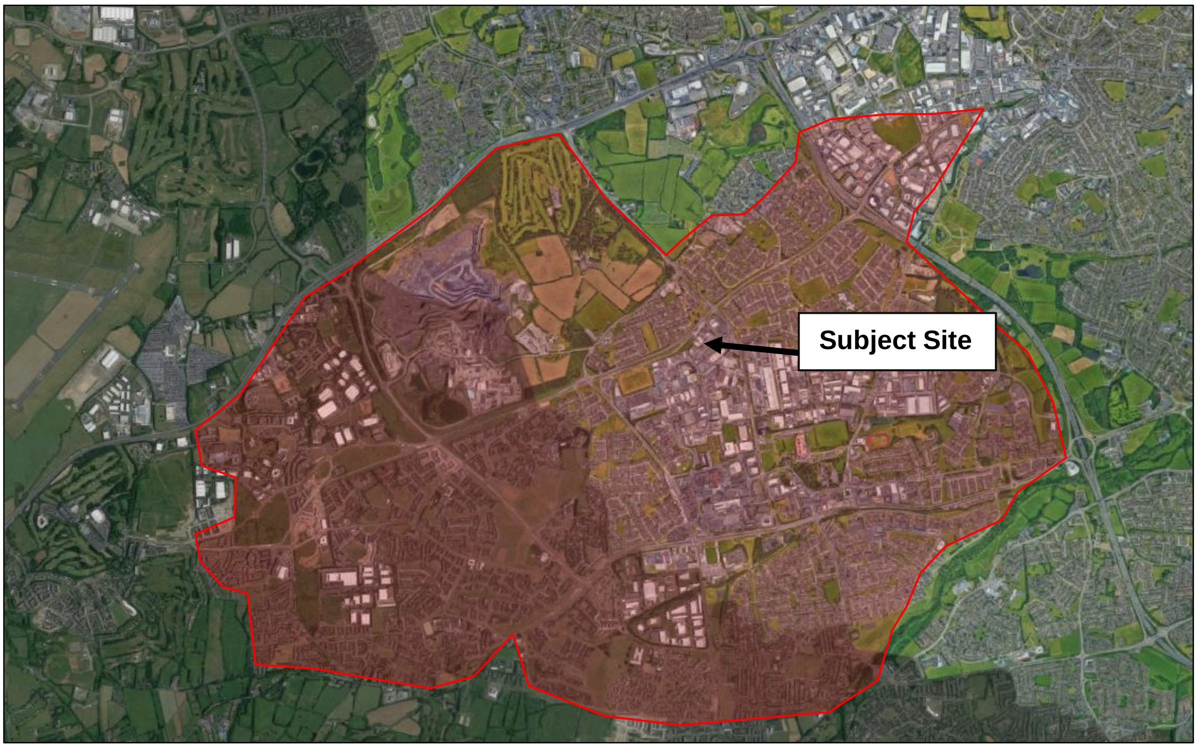


Figure 4.2 Location of subject site in context of the settlement of Tallaght (shown in red)

Settlement/Province	2006	2011	2016	Percentage Change		
				06-11	11-16	06-16
Ireland - State	4,239,848	4,588,252	4,761,865	8.2	3.8	12.3
South Dublin County	246,935	265,205	278,767	7.4	5.1	12.9
Tallaght	65,167	69,454	76,119	6.6	9.6	16.8
Electoral Division of Tallaght Springfield	7,876	9,123	11,012	15.8	20.7	39.8

Table 4.1 Population Trends 2006-2016

The above table identifies the significant population growth that the settlement of Tallaght has experienced in comparison to Ireland in recent years. The CSO data outlines that Ireland has seen a 12.3% increase in population from 2006 to 2016, whilst during the same period, Tallaght has experienced a 16.8% growth. The electoral division of Tallaght Springfield has grown by an incredible 39.8% in the same period. The population within the settlement of Tallaght is projected to continue to increase due to recent grants of permission for large residential developments within the area.

Approximately 24.9% of the population of the Electoral Division of Tallaght Springfield is under 18 years of age, compared to 26.2% of the state population. Similarly, approximately 11.3% of the population of the Electoral Division of Tallaght Springfield population are over the age of 65 years in comparison to over 13.3% of the State population. The Dependency Ratio (i.e. those not in the workforce – aged 0-18 and over 65) can therefore be said to be approximately 36.2% and is thus lower than that of the State, the figure for which is 39.5%.

Age Cohort	Population in each Age Cohort - 2016		
	State	South Dublin County	Electoral Division of Tallaght Springfield
All Ages	4,761,865	278,767	11,012
0-4	331,515	21,733	993
5-12	548,693	34,665	1,193
13-18	371,588	22,270	565
19-24	331,208	19,567	778
25-44	1,406,291	87,539	4,400
45-64	1,135,003	62,068	1,840
65-69	211,236	11,864	601
70+	426,331	19,061	642

Table 4.2 Population Profile 2016 in Electoral Division of Tallaght Springfield, South Dublin County & the State

4.3.2 Potential Impact of the Proposed Development

‘Do Nothing’ Scenario

Were the development to not proceed, the present industrial/commercial use of the subject site would remain. The subject site has been zoned is zoned ‘REGEN’, the objective of which is:- *‘to facilitate enterprise and/or residential-led regeneration*’. As such, a ‘do nothing’ scenario would mean that this objective of the Development Plan would not be met, and some 1104 no. households would remain uncatered for.

As such, the impact of the development not proceeding on population profile and trends in the area would be negative.

Construction Phase

The construction phase of the proposed development should not have any direct impact on the population of the area as no additional persons will be housed on site.
The construction phase will generate a greater number of people within the area on a temporary basis, as the construction will see construction workers and delivery drivers arriving and leaving the site at the start and end of each day. However, the implications of this are not considered to have significant effects to the surrounding community due to the location of the site in the Cookstown Industrial Estate, separated from the nearest residential area by the Katherine Tynan Road to the north.

Operational Phase

The operational phase of the proposed development will have a direct impact on the population of the area and the subject lands. With a total of 1,104 no. residential units proposed to be built, the anticipated increase in population for the site can be expected to be c. 2,780. This is based on average household numbers for studio, one, two, and three-bedroom residential units. The impacts of an increase in the population within the site will be gradual during the completion of the development. The population of the development will not significantly impact the surrounding area due to the existing boundary treatments of the Katherine Tynan Road and LUAS line to the north, industrial lands (zoned REGEN) to the south, west, and east of the development site.

The new community resulting on the subject site is considered significant and positive, particularly in the context of current housing demand.

4.4 Employment and Economic Activity

4.4.1 Receiving Environment (Baseline Scenario)

The CSO's Quarterly Labour Force Survey provides information in relation to national employment levels, unemployment levels and current labour force participation rates. The CSO's quarterly Labour Force Survey (Q1 for 2020) indicated an annual increase of 2.2% (51,500), in employment at national level, bringing total employment to 2,353,500. This shows a steady increase from the previous years with a 3.7% in 2019 Q1, 2.9% in 2018 Q1 and 2.5% in 2017 Q2. The current number of persons in employment people is difficult to ascertain at this time due to the effects of Covid-19 on the economy.

Nationally, in the CSO's quarterly Labour Force Survey (Q1 for 2020) unemployment remained the same as the previous year at 114,400. The number of people currently unemployed is difficult to ascertain at this time due to the effects of Covid-19 on the economy.

Nationally, of the 14 no. economic sectors that form the Irish economy, 10 no. have shown an increase in employment figures for Q1 2020. The largest of these was Information and Communication which increased by 8.3%, followed by Professional, Scientific and Technical Activities (10.8%). It is unknown how these figures will be affected by Covid-19 as data is unclear at present.

In a more local context, the 2016 census identified that the primary employment sectors of those living in the Electoral Division of Tallaght Springfield were 'Commerce and Trade' and 'Professional Services', which together accounted for 47.5% of those employed. The most common occupations were 'Elementary Occupations', 'Professional Occupations' and 'Skilled Trades' which represent 16.4%, 10.7% and 10.1% of the total working population, respectively.

A wide range of businesses operate and employment opportunities currently exist in Tallaght and as the Cookstown Industrial Estate is developed it is expected that the variety of businesses operating and the employment opportunities will improve further in the immediately surrounding area. Further to this, employment opportunities in the broader Dublin area are highly accessible from Tallaght. It is proximate to a number of main arterial routes into Dublin City centre and the M50 motorway thereby providing access to a large extent of the Irish road network. It is also well serviced by public transport with multiple Red Line Luas stops featuring in the area offering a high frequency, high capacity public transport service with direct links to Dublin City Centre, Dublin Docklands, Heuston Station, Citywest Campus and Tallaght Hospital. Multiple Dublin Bus Routes also serve the Tallaght area.

4.4.2 Potential impact of the Proposed Development

<u>'Do Nothing' Scenario</u>

Were the current industrial/commercial land use to continue on the subject site, the current levels of employment required to maintain this activity would remain steady and the subsequent impact on employment would be neutral.

In a 'do nothing' scenario, the economic investment arising from a large scale construction project would not be availed of, and this strategically located, zoned site would remain in use for industrial/commercial land use. This would represent a lost opportunity in economic terms.

<u>Construction Phase</u>

The construction phase of the proposed development will likely provide a positive improvement to the to the economy and employment prospects within Tallaght and the surrounding area more broadly, particularly within the wider construction sector. The construction of a mixed-use development, including 1,104 no. apartments, will provide a substantial number of construction-related jobs for the duration of the development. Whilst it is difficult to place a total number on the employment for the proposed development, the extent of work and varying construction-related industries required for the residential development will provide a variety of employment phased throughout the development.

The construction phase will also have secondary and indirect 'spin-off' impacts on ancillary support services in the area of the site, such as retail services, together with wider benefits in the aggregate extraction (quarry) sector, building supply services, professional and technical professions etc. These beneficial impacts on economic activity will be largely temporary but will contribute to the overall future viability of the construction sector and related services and professions over the phased construction period.

Whilst there will be some negative impacts felt to the wider community during the construction phase by way of noise, dust and traffic, this is unlikely to be significant. These issues and appropriate mitigation measures are addressed in Chapters 8, 9 and 10 of the EIAR and in the Construction & Demolition Waste Management Plan and Outline Construction Environmental Management Plan, both prepared by AWN Consulting, which accompany the application.

Operational Phase

The operational phase of the proposed development will result in the provision of 1104 no. apartments, 4 no. commercial units, 1500 sqm of office space, a 245sqm crèche and a 1688sqm public plaza on the subject site. This will provide accommodation for c. 2,780 people, based on 132 no. studios, 475 no. 1-bed apartments, 208 no. 2-bed apartments, 244 no. 2-bed duplex units and 45 no. 3-bed apartments. In addition to this, employment opportunities will be created by the childcare facility, commercial units and offices proposed on site.

This increase in population in the area will enhance local spending power and will assist with the delivery of a critical mass of population which will support a wide range of additional local businesses, services, transport infrastructure and employment opportunities. This will play a role in the future growth of Tallaght and the improvement of local amenities and infrastructure.

4.5 Land Use and Settlement Patterns

4.5.1 Receiving Environment (Baseline Scenario)

The subject site is a brownfield site that has been earmarked for regeneration. Located adjacent to the northern boundary of the Cookstown Industrial Estate, the site is located immediately adjacent to the Red LUAS line, offering direct connections to Dublin City Centre and Tallaght Town Centre.

Similar developments have been granted permission within the broader Cookstown Industrial Estate in recent years, paving the way for a high density town with strong transport links to Dublin.

Whilst the subject site and immediately adjoining lands have predominantly operated as industrial land, present zoning (REGEN) reflects changing land use patterns for this area, north of Tallaght Town Centre. The zoning of the land reflects the opportunity for Tallaght to increase the population and employment opportunities for the town and become more than a suburb of Dublin City. As Figure 4.3 overleaf outlines, the subject site is zoned REGEN, the objective of which is to *'facilitate enterprise and/or residential led regeneration'*.

Tallaght has been identified in the South Dublin County Development Plan 2016-2022 as a 'Metropolitan Consolidation Town', and as such, specific policies and objectives relating to the growth of population and economic development of the town have been identified. The Development Plan notes that:

> *'Strong active urban places within the Metropolitan Area with strong transport links. These towns should be developed at a relatively large scale as part of the consolidation of the Metropolitan Area and to ensure that they support key public transport corridors connecting them to the City, to each other and to Large Growth Towns in the Hinterland. Long term growth could see them expanding to a population of up to 100,000 people in a planned and phased manner.***

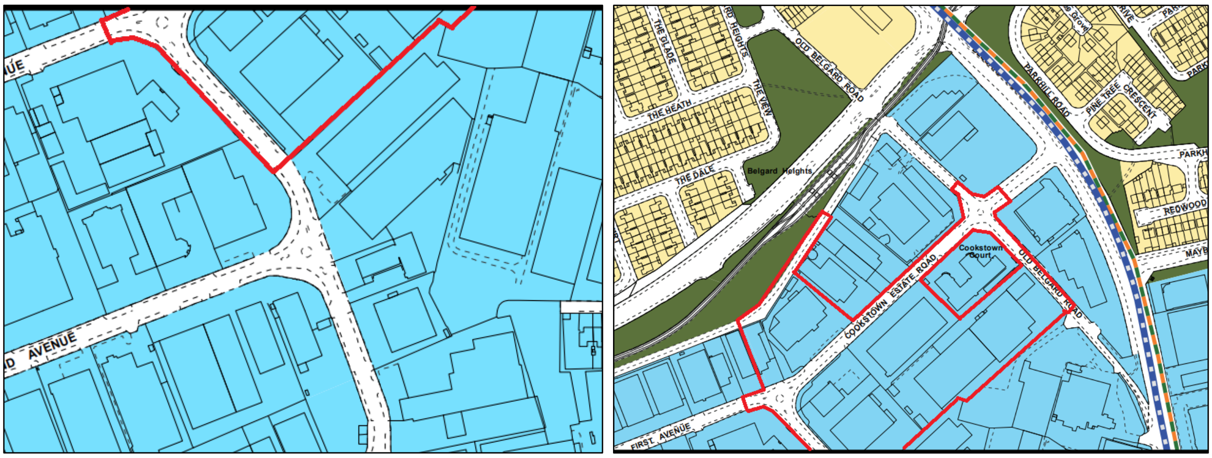


Figure 4.3 Extracts from South Dublin County Development Plan 2016-2022 zoning Map Nos. 5 and 9 showing the application site (in red) within lands with Zoning Objective 'REGEN'

The proposed development is in keeping with the policies and objectives for Tallaght and is consistent with the identified land uses earmarked for the site, and appropriately responds to the existing settlement pattern and residential densities of nearby developments, including recently approved developments.

4.5.2 Potential impact of the Proposed Development

'Do Nothing' Scenario

Were the development to not proceed, the present industrial/commercial use of the subject site would remain. As discussed in Section 4.3.2 above, a do-nothing scenario would mean that the objectives of the Development Plan would not be met, and some 1104 no. households would remain uncatered for.

Construction Phase

The construction phase of the development will see site works comprising primarily of infrastructural works in preparing the road and drainage infrastructure and works on the subject site to accommodate the residential apartments.

As the development is on a brownfield site within an industrial estate, the demolition works are limited to the existing warehouses and industrial units (I note the existing petrol station associated with Circle K Belgard is to be retained). Given the nature of work carried out at this location and the lack of residential units, it is submitted that the proposed development works will not cause any significant disturbance to the adjoining properties.
There will be an increase in population on the site during construction as a result of the proposed development. Given the location and size of the subject site, the rise of employment numbers on-site is not considered to negatively impact the surrounding community. There may be some increase in traffic on Cookstown Road and Old Belgard Road which immediately abut the site, however, this is considered to be within reason, and will be managed in accordance with a Traffic Management Plan which will be prepared and agreed with South Dublin County Council prior to construction commencing.

Operational Phase

The operational phase will see former industrial land transformed into residential land use which in keeping with planning policy, helps address the growing population and housing shortage across Ireland and Dublin in particular. The proposed development will feature a creche, 4 no. commercial units, 1500sqm of offices, and a range of amenity facilities for residents. It is noted that the area is well served by primary and secondary schools with an additional 4 storey school proposed by South Dublin County Council as part of a 2.46Ha site development proposed south of the subject site, immediately north of Belgard Square North.

The development will include public open space to be utilised by the surrounding community. The public open space will be fronted by the proposed commercial units as well proposed apartments, providing passive surveillance over the public space. The proposed public plaza also ties in with the new urban square earmarked immediately south of the subject site in the Tallaght Town Centre Local Area Plan 2020-2026.

4.6 Housing

4.6.1 Receiving Environment (Baseline Scenario)

Housing completions across the country plummeted after the recession occurred in 2007/2008 with completions declining from almost 90,000 no. per year in 2007 to approximately 11,000 no. in 2014. In light of this, the Government published the ‘Rebuilding Ireland - Action Plan for Housing and Homelessness’ policy document which includes the following central objective:

> *“to double the completion level of additional homes in the next four years to deliver the 25,000 homes or more required annually”.*

According to the CSO Q4 New Dwelling Completions Report, 17,952 and 21,241 new dwellings were completed in 2018 and 2019, respectively. In both years, the no. of dwellings constructed falls short of the target set in the ‘Rebuilding Ireland - Action Plan for Housing and Homelessness’ policy document.

The National Planning Framework - Ireland 2040 requires delivery of a baseline of 25,000 homes annually to 2020, followed by a likely level of 30-35,000 annually up to 2027. Within this output 112,000 households are expected to have their housing needs met in a social housing home over the next decade. To achieve the objective of compact growth, 40% of future housing delivery is to be delivered within and close to the existing footprint of built-up areas.

As discussed in Section 4.5.1, the South Dublin County Development Plan 2016-2022 identifies Tallaght as a ‘Metropolitan Consolidation Town’. The Core Strategy contained therein indicates that an increase of population of up to 68,789 should be planned for in Tallaght.

Further to the above, the Tallaght Town Centre Local Area Plan 2020-2026 estimates 9,700 to 12,800 new homes, achieving a population of up to 38,000 people, will be provided on the LAP lands over a period of up to 20 years.

4.6.2 Potential impact of the Proposed Development

‘Do Nothing’ Scenario

There are currently no persons residing on the subject lands. The subject site comprises a brownfield site with existing buildings on site comprising industrial and commercial units. Were the development not to proceed, this scenario would continue and the site would remain in its current use.
The impact of a ‘do nothing’ scenario would be negative in terms of housing in the Tallaght area as the subject site would fail to realise the development potential afforded by its regeneration zoning.

Construction Phase

As discussed in Section 4.3.2 previously, the construction phase of the proposed development will see no additional persons will be housed on site.

Operational Phase

The proposed development will result in the addition of 1104 no. units to the supply of housing in the Tallaght area. These will be a mixture of studios, 1-bedroom, 2-bedroom and 3-bedroom apartments.

The addition of these proposed units will contribute to the housing unit target outlined for Tallaght in the South Dublin Development Plan 2016-2022, as well as the Tallaght Town Centre Local Area Plan 2020-2026.

4.7 Community Infrastructure and Social Facilities

4.7.1 Receiving Environment (Baseline Scenario)

This section of the EIAR assesses the impact of the proposed development on the local community and the social infrastructure and facilities in the vicinity of the subject site.

The subject site is located to the north of the Tallaght Town Centre in the northern part of the Cookstown Industrial Estate. The spread of the population is contained to the north, north-east, east and west of the subject site. Currently, the population is sparse to the south, south-west and south-east between the subject site and Tallaght town centre.

As illustrate in the Social Infrastructure Audit included Appendix 4 to the Tallaght Town Centre Local Area Plan 2020-2026 (a copy of which is included at Appendix 4.1), Tallaght features a wide range of community infrastructure including education facilities; facilities associated with social service provision; health and medical centres; childcare facilities including private nurseries; sporting and recreation facilities; social/community facilities; and religious buildings. Further to this, these existing facilities will be improved upon as a result of the additional open space areas being introduced as part of the Tallaght Town Centre Local Area Plan 2020-2026 and a 2.46Ha site re-development being carried out by South Dublin County Council immediately north of Belgard Square North.

4.7.2 Potential impact of the Proposed Development

<u>‘Do Nothing’ Scenario</u>

There are no social services currently located on the subject site, therefore there would be a neutral impact in a ‘do nothing’ scenario.

<u>Construction Phase</u>

The construction of the proposed development will unlikely to have any significant implications for the existing community infrastructure and social facilities. The immediate effects of the construction phase will be centred around the subject site. The construction phase will have some impacts on the surrounding environment through noise and increased traffic. There are however no foreseeable short-term construction impacts that will impact negatively on the community infrastructure or social facilities.

<u>Operational Phase</u>

The population growth that will occur as a result of the proposed development will provide a positive impact to the Tallaght environs and will contribute to the existing social and community infrastructure. The new residents of the development would likely lead to increased funding and patronage of existing services and facilities. The overall size of the development and population growth will not be of vast proportions that the existing community and social infrastructure cannot cope with the demand. In addition, the critical mass generated by the proposal would likely create demand for new facilities and services, which would indirectly benefit the wider area.

The commercial/retail units, offices and childcare facility featuring within the proposed development, due to the proposed positioning and access arrangements, will serve both residents of the subject development and the surrounding area more broadly. This will improve community infrastructure and social facilities in this area.

The inclusion of landscaped public open space areas, a pedestrian/cycle link to the Belgard Luas Stop, and road, junction and streetscape upgrade works along First Avenue, Cookstown Road and Old Belgard Road, including the installation a signalized junction at the intersection of First Avenue and Cookstown Road and Old Belgard Road and Cookstown Road and cycle and pedestrian paths will also impact the social amenities of the town in a positive manner. It will enable more residents and visitors to gain access to the high-quality open space, improving residents’ ability to lead a healthy lifestyle, and will improve pedestrian and cyclist safety. This will be a significant positive impact of existing and future residents.

It is therefore considered that the proposal will not have any adverse impacts on the existing community and social infrastructure.

4.8 Health and Safety

4.8.1 Receiving Environment (Baseline Scenario)

The subject site is a brownfield site located to the north of the Cookstown Industrial Estate, south of the Red Luas Line and Katherine Tynan Road. The subject site features an existing petrol station (Belgard Circle K), to the west fronting Old Belgard Road, which is to be retained as part of the proposed development. The existing petrol station includes a fuelling forecourt constructed of reinforced concrete slab with four pump islands dispensing petrol and diesel. The forecourt is enclosed by a perforated drainage channel and sheltered with a canopy. Drainage from the forecourt is to a hydrocarbon interceptor. There is also a car wash slab approximately 5 m west of the forecourt which drains toa separate wash interceptor. Petrol and diesel are stored in an underground tank farm below the forecourt, immediately east of the pump islands. The tanks are filled via off-set fill points located immediately east of the tank farm. The unground tank farm is vented to a vapour collection manifold in the eastern corner of the forecourt. There is a solid fuels store and a bottled gas cage in the western corner of the site.

In preparing this Environmental Impact Assessment Report, RSK Ireland Limited were engaged to prepare a Generic Quantitative Risk Assessment (a copy of which is included at Appendix 4.2). The purpose of the Generic Quantitative Risk Assessment was to establish the contamination status of the soil and groundwater underlying the part of the site proximate to the existing petrol station and identify any potentially significant risks to human health and / or the water environment. An environmental site assessment was carried out in preparing this report, including the drilling of boreholes, monitoring of gas and the taking of soil and groundwater samples at the site in May 2020. The soil and groundwater samples were subsequently submitted to a UKAS accredited laboratory (ALS) for chemical analysis for potential contaminants of concern (COC).

In the context of human health, this assessment concluded the following in relation to the current situation on the subject site:

> *The soil GACs for protection of human health with regards to a residential without home grown produce land use scenario were not exceeded in any of the soil samples analysed. The laboratory analysis of groundwater samples reported that there are no concentrations of contaminants that exceeds the adopted GrAC for human health.*
>
> *As noted in section 6.2.1, the groundwater GACs for the protection of environmental waters were exceeded in MW104 and MW105 for MTBE indicating the potentially complete pollutant linkage to the locally important aquifer, the groundwater abstraction or the surface waters.*
>
> *…..RSK does not consider that the contaminant concentrations identified in groundwater pose a significant risk to Human Health as none of the GACs have been exceeded.*
>
> *Following four rounds of gas monitoring, a maximum GSV of 0.0009 l/hr was recorded. This GSV would initially classify the site as Characteristic Situation 1 (CS1) - VERY LOW RISK.*
>
> *This classification determines that special gas protection measures would not be required within the proposed buildings.*

The surrounding environs consists of a mix of commercial, warehousing and industrial land uses. The Cookstown Industrial Estate is devoid of Seveso sites, which would be likely to result in a risk to human health and safety. This is illustrated in the Extracts from South Dublin County Development Plan 2016-2022 zoning Map Nos. 5 and 9 included previously at Figure 4.3 and in the mapping tool excerpt included in Figure 4.4 overleaf.

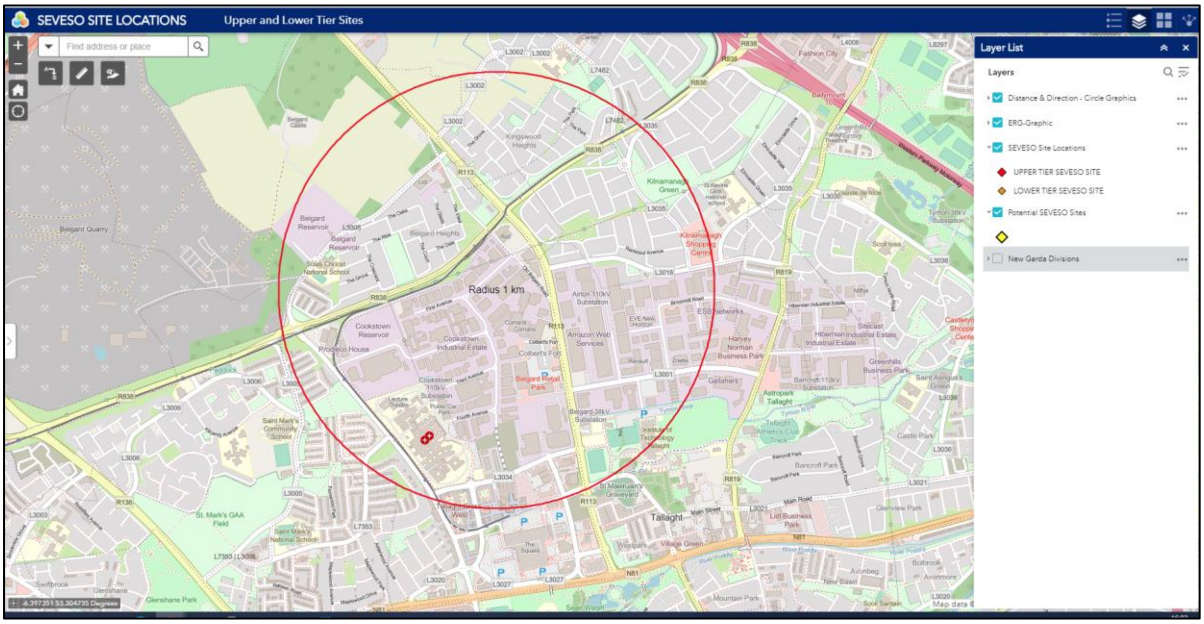


Figure 4.4 Seveso Sites within 1km from the Site

The EPA website indicates that there are 3 no. IPPC licensed facilities within 1 km of the subject site. They are as follows:

- Print and Display Ltd, approximately 200 metres south-west of the site, which operates a business of printing for commercial clients, offering vinyl wall graphics, vehicle branding and other large-scale visual advertising formats;
- INX International Ink Company Ltd, approximately 600 metres south-west of the site, which is a manufacturer of high-performance printing inks and coatings for commercial, packaging, and digital print application; and
- Bimeda Animal Health Ltd, approximately 700 metres southeast of the site, which is a manufacturer, marketer and distributor of animal health products and veterinary pharmaceuticals.

The EPA website indicates that there are 3 no. licensed waste facilities within 1km of the subject site. They are as follows:

- Tonge Industries Ltd, approximately 300 metres west of the site, which holds an active waste license;
- Starrus Eco Holdings Ltd, located approximately 500 metres south-west of the site, which holds an active waste license; and
- Guardian Environmental Services Ltd, located approximately 700 metres south-west of the site, which have surrendered their waste license.

There are no section 4 discharges located within 1 km of the subject site.

4.5.2 Potential impact of the Proposed Development

<u>'Do Nothing' Scenario</u>

The site is in a brownfield state and is used for purposes. The subject site does not contain any dwellings and therefore does not currently accommodate a resident population. Were the development not to proceed, this scenario would continue and the site would remain in its current use. Accordingly, there would be a neutral impact on health and safety in a do-nothing scenario.

Construction Phase

The construction of the proposed development will give rise to several short-term impacts which will include noise, dust and an increase in traffic flow arising from site workers, deliveries etc. The construction impacts are dealt with in the relevant chapters of this EIAR document. In general, the construction of the proposed development will be done so in accordance with the Construction Management Plan and Traffic Management Plan (both of which will be agreed with South Dublin county Council) which will ensure that the works do not pose an adverse risk to the health and safety of both the surrounding properties/community and the workers on-site. Particular care will be taken in relation to construction proximate to the existing petrol station being retained on site.

The construction methods employed and the hours of construction proposed will be designed to minimise potential impacts. The development will also comply with all Health & Safety Regulations during the construction of the project.

Given the above, it is considered that the construction impacts of the proposed development on health and safety will be neutral.

Operational Phase

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

The inclusion of multiple open space areas throughout the development, including adjacent to the proposed commercial/retail units and creche, will increase the availability of exercise and leisure activities. This will encourage residents and visitors to move around the site therefore giving a greater level of physical activity improving the physical health of the local people whilst also improving the levels of mental health and wellbeing.

The scheme is designed to encourage more sustainable forms of transport including walking, cycling and an increased use of public transport, with a cycle/pedestrian link to the Belgard LUAS Stop as well as upgrades to the road, junction and streetscape proposed along First Avenue, Cookstown Road and Old Belgard Road. Walking and cycling can help increase activity levels which again can help improve cardiovascular health, mental health and wellbeing. The increased level of sustainable journeys will help to reduce the level of car use in and around the area. Reduced car use is linked to improvements in air quality levels which is beneficial for respiratory health. The operation of the proposed development will therefore have a long term, moderate positive effect on residents and visitors.

Potential health impact of resultant noise and odours from the petrol station being retained on site have been minimised through the block layout proposed for Block D. Residential uses have been positioned to the west of Block D (furthest away from the petrol station), with offices and commercial units proposed immediately adjacent to the petrol station being retained on site. Further to this, the petrol station will continue to operate in accordance with best practice standards and an operational management plan.

The proposed development will not result in any significant impacts on human health and safety once completed and operational. The proposed development therefore is unlikely to result in negative impacts in relation to population and human health in this regard.

4.9 Risk of Major Accidents and Disasters

4.9.1 Receiving Environment (Baseline Scenario)

The 2018 EIA Guidelines state that an EIAR must include the expected effects arising from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project.

There are four key factors that could contribute to a ‘major accident or disaster’ occurring on the subject site. They are as follows:

- Proximity of the Katherine Tynan Road to the subject site (north of the subject site);
- Proximity of the Red LUAS Line to the subject site (north of the subject site);
- Proximity of 110kV power lines to the subject site (north of the subject site); and
- The petrol station (Circle K Belgard) currently featuring and being retained on the subject site (west of the site).

The location of these in the context of the subject is illustrated in Figure 4.4 below.

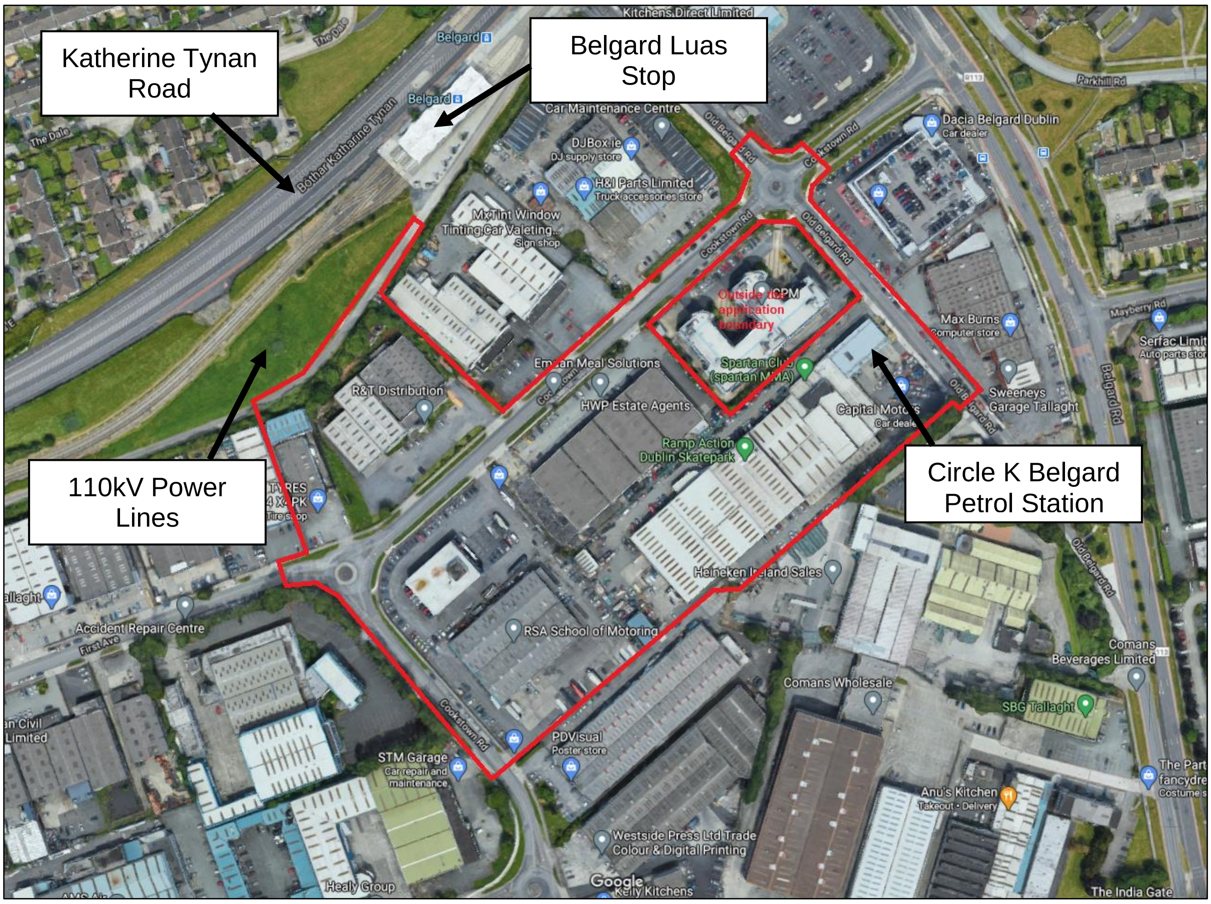


Figure 4.4 Location of subject site in context of Red LUAS Line, Katherine Tynan Road, 110kV power lines (all immediately north) and Circle K Belgard petrol station (west of the site)

4.9.2 Potential impact of the Proposed Development

<u>‘Do Nothing’ Scenario</u>

Were the development not to proceed, risk from the 110kV power lines, Red LUAS Line and Katherine Tynan Road (immediately north) would be low given the separation distance that exists between them and the subject site and the landscaped buffer that exists between them and the subject site. Similarly, risk from the existing petrol station on site (Circle K Belgard) would be low given it is long established and operates in accordance with best practice standards and an operational management plan.

Construction Phase

The construction of the proposed development will be done so in accordance with a Construction Management Plan (based on the Outline Construction Environmental Management Plan, prepared by AWN Consulting) to manage the day to day proceedings and to ensure that works on site do not create an unsafe environment. Particular care will be taken in the context of the westernmost part of the site, where development is proposed adjacent to the existing petrol station on site. It is worth noting that it is not proposed to carry out any works in the area where the petrol pumps and underground storage areas currently feature.

Works in the north of the site will be carried out in line with the Code of Practice for Avoiding Danger from Overhead Electricity Lines, May 2019, to ensure the adjacent 110kV power lines are unimpacted by development. A copy of this document is included at Appendix 4.3.

The construction traffic entering and exiting the site will be managed appropriately through a Traffic Management Plan which will be agreed with South Dublin County Council prior to construction commencing. The site will not require access directly onto the Katherine Tynan Road during construction which will significantly reduce the likelihood of any major accidents with vehicles or large trucks accessing the subject site. All access will be via Old Belgard Road and Cookstown Road.

Therefore, there is not expected to be any major accidents or disasters as a result of the construction of the proposed development.

Operational Phase

The operation of the proposed development similarly will not negatively impact the surrounding population or increase the likelihood of a major accident or disaster.

It is acknowledged that the northern part of the proposed development is proximate to the Red LUAS Line, Katherine Tynan Road and 110kV power lines. As outlined in Figure 4.4 above, there is an existing separation distance and buffer between the site and Red LUAS Line/Katherine Tynan Road/the110kV power lines and additional landscaping will protect the subject site from them. Further to this in the context of the 110kV power lines, the proposed development has been setback a minimum of 23 metres from the power lines in accordance with the guidance set out in the Code of Practice for Avoiding Danger from Overhead Electricity Lines, May 2019. These measures will help to ensure that any major accidents that occur on the LUAS line or road or issues that occur with the power lines do not have any impacts on the proposed development.

The existing petrol station being retained on site will continue to operate in accordance with best practice standards and an operational management plan but will benefit from a larger commercial space being provided in Block D.

It is therefore considered that the operation of the development will not increase the risk to residents of any major accidents or disasters due to the surrounding environment.

4.10 Cumulative Impacts

The cumulative effects of the development on the surrounding population and human health have taken into consideration the existing surrounding environment, and in particular, the established developed lands located north and north west of the subject site, and lands to the south of the subject site.

The development of the site will likely have a positive cumulative impact on Tallaght in helping the town accommodate the projected growth which has been projected to be near 100,000 people for the Metropolitan Consolidation Town. The economy will benefit both during the construction phase and operation phase increasing the economic activity within the town. The site is well connected with access into Dublin and Tallaght via the LUAS line and several bus routes.

There are not considered to be any significant adverse cumulative impacts to the population and human health either during construction or operation phase of the proposed development at Cookstown Road.

4.11 Mitigation Measures

Construction Phase

All standard health and safety procedures will be implemented at every stage of this project. The Main Contractor for the project is responsible for the method in which the demolition and construction works are carried out and to ensure that best practices and all legal obligations including Local Authority requirements and Health and Safety legislation are complied with. Further to this, Building Regulations will also be adhered to during the construction phase.

A range of construction related remedial and mitigation measures are proposed throughout this EIAR document with reference to the various environmental topics discussed under each. These measures seek to ensure that any likely significant adverse environmental impact on human health during the construction phases are either ameliorated to have an acceptable level of impact or avoided altogether. Included in these measures is the requirement that a detailed construction traffic management plan be prepared by the Contractor and agreed with South Dublin County Council as the Road Authority prior to commencing works on the public road. This Construction Traffic Management Plan will include restrictions on deliveries and access to the construction site. Further, measures with regards to noise and dust abatement covered elsewhere within this EIAR will be implemented during construction and will limit impacts on population and human health.

Further to the above, working hours on site will be as such that the residential amenity of adjacent residences is not unreasonably impacted upon. They will be agreed with the Council in full as part of the required construction management plan.

As a result of the implementation of the abovementioned measures, the impacts of the construction phase of the development on population and human health are not anticipated to be significant. Furthermore, all impacts will be temporary in nature.

Operational Phase

The mitigation measures relating to the operation phase of the development concerning traffic, transport, noise, vibration, water, air and dust quality and landscaping as set out in this EIAR (and listed in Chapter 15.0) will be carried out in full to minimise impacts on residents of the development, adjacent residents and human health.

4.12 Monitoring

There is no other ongoing monitoring required in relation to the effect of the proposed development on the population and human health.

5.0 BIODIVERSITY

5.1 Introduction

This chapter has been prepared by Bryan Deegan (MCIEEM) of Altemar Ltd. It assesses the biodiversity value of the proposed development area and the potential impacts of the development on the ecology of the surrounding area and within the potential zone of influence (ZOI). Standard construction and operational phase control measures, in addition to monitoring measures are proposed to minimise potential impacts and to improve the biodiversity potential of the proposed development site. However, it is important to note that none of the measures proposed are necessary for the protection of Natura 2000 sites or their conservation objectives. These standard measures are to comply with legislation and in particular Water Pollution Acts.

The programme of work in relation to biodiversity aspects of the EIAR have been designed to identify and describe the existing ecology of the area and detail sites, habitats or species of conservation interest. It also assesses the significance of the likely impacts of the scheme on the biodiversity elements and designs mitigation measures to alleviate identified impacts.

The proposed development is a mixed-use development at Cookstown Industrial Estate, Dublin 24, as described in Chapter 2.0.

A separate AA Screening, in accordance with the requirements of Article 6(3) of the EU Habitats Directive, has been produced to identify potential impacts of the development on Natura 2000 sites, Annex species or Annex habitats. It concludes that "*No Natura 2000 sites are within the zone of influence of this development. Having taking into consideration the effluent discharge from the proposed development works, the distance between the proposed development site to designated conservation sites, lack of direct hydrological pathway or biodiversity corridor link to conservation sites and the dilution effect with other effluent and surface runoff, it is concluded that this development that would not give rise to any significant effects to designated sites. The construction and operation of the proposed development will not impact on the conservation objectives of features of interest of Natura 2000 sites*."

Altemar Ltd. is an established environmental consultancy that is based in Greystones that has been in operating in Ireland since 2001. Bryan Deegan MCIEEM is the Managing Director of Altemar Ltd. and holds a M.Sc. Environmental Science, BSc (Hons.) in Applied Marine Biology and National Diploma in Applied Aquatic Science. He has over 26 years' experience as an environmental consultant in Ireland and was the ecologist for all aspects of this project. Previous projects where Altemar were the lead project ecologists include the Lidl Ireland GmbH regional distribution centres in Newbridge and Mullingar, 18 airside projects for daa at Dublin Airport and 7 fibre optic cable landfalls in Ireland including the New York to Killala cable project in 2015.

5.2 Research Methodology

A pre-survey biodiversity data search was carried out. This included examining records and data from the National Parks and Wildlife Service (NPWS), National Biological Data Centre (NBDC) and the Environmental Protection Agency (EPA), in addition to aerial, 6 inch maps and satellite imagery. A Phase I habitat survey of the site was undertaken within the appropriate seasonal timeframe for terrestrial fieldwork. Field surveys were carried out as outlined in Table 5.1. All surveys were carried out in the appropriate seasons with the exception of mammal surveys. However, site is primarily built land and good access was possible to all areas on site additional mammal surveys were not deemed to be required due to the lack of features on site which would form resting or breeding places for mammals.

Area	Surveyors	Survey Date
Terrestrial Ecology	Bryan Deegan (MCIEEM) of Altemar	16th September 2020
Bat Fauna	Bryan Deegan (MCIEEM) of Altemar	16th September 2020

Table 5.1 Assessment of Key Ecological Areas in the Environmental Impact Assessment

Desk studies were carried out to obtain relevant existing biodiversity information within the ZOI. This area includes the areas of built land and habitats on site. The assessment extends beyond the immediate development area to include those species and habitats that are likely to be impacted upon by the project. No watercourses are located proximate to the proposed development. As a result, the potential ZOI beyond the site would be deemed to be limited to noise and light impacts, with the potential for downstream impacts to extend the ZOI beyond the site outline via public drainage networks. Details of the proposed development are seen in Chapter 2.0 of the EIAR.

The designated conservation sites within 15km of the site were examined for potential impact even though these areas were deemed to be outside the ZOI. Sites beyond 15km had no direct or indirect pathways. This assessment included sites of international importance; Natura 2000 sites (Special Areas of Conservation (SAC), Special Protection Areas (SPA)) and Ramsar sites and sites of National importance ((Natural Heritage Areas (NHA), proposed Natural Heritage Areas (pNHA). Up to date GIS data (2020 NPWS data shapefiles) were acquired and plotted against 5, 10 and 15km buffers from the proposed development site. A data search of rare and threatened species within 10km of the proposed site was provided by NPWS. Additional information on rare and threatened species was researched through the National Biodiversity Data Centre maps. In addition, a separate AA Screening was carried out for the project and is included with the supporting documentation for this application.

5.2.1 Terrestrial and Avian Ecology

A pre-survey data search was carried out. This included a literature review to identify and collate relevant published information and ecological studies previously conducted and comprised of information from the following sources; the National Parks and Wildlife Service, NPWS Rare and Protected Species Database, National Biodiversity Data Centre, EPA WMS watercourses data, in addition to aerial, 6 inch, satellite imagery. Following the desktop study, walk-over assessments of the site were carried out on the 16th September 2020. Details of this are seen in Section 5.3. Surveys were carried out by means of a thorough search within the study area. Habitat mapping was carried out according to Fossitt (2000)[1] using AcrGIS 10.5 and displayed on Bing satellite imagery or street mapping. Any rare or protected species or habitats were noted. As part of the fieldwork an invasive species assessment was carried out. Birds noted on site were classed based on the Birds of Conservation Concern In Ireland classification of red, amber and green, which is based on an assessment of the conservation status of all regularly occurring birds on the island of Ireland.

5.2.1.1 Bat Fauna

Internal and external areas of the onsite structures were inspected for bats and/or their signs using a powerful torch (141 Lumens) – Petzl MYO RXP. The site survey was supplemented by a review of Bat Conservation Ireland's (BCIreland) National Bat Records Database. A bat detector and emergent survey was carried out on the 16th September 2020.

5.2.2 Rating of Effects

The terminology for rating impacts is derived from the EPA Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (2017).

5.2.3 Difficulties Encountered

No difficulties were encountered in relation to the preparation of the Biodiversity chapter of the EIAR. The bat survey was undertaken within the active bat period (April to September) and a detector survey was possible.

5.2.4 Consultation

Consultation was carried out with the project team in relation to the preparation of the EIAR and the minimisation of potential impacts on biodiversity.

[1] The Heritage Council's A Guide to Habitats in Ireland (Fossitt, 2000) is the standard habitat classification system used in Ireland and can be found at:
https://www.npws.ie/sites/default/files/publications/pdf/A%20Guide%20to%20Habitats%20in%20Ireland%20-%20Fossitt.pdf

5.3 Receiving Environment

5.3.1 Designated Conservation Sites

As can be seen from Figures 5.1 (SAC's within 15km), 5.2 (SPA's within 15km), 5.3 (watercourses in proximity to the site), 5.4 (Ramsar sites within 15km) and 5.5 (NHA and pNHAs within 15km) there are no conservation sites within four kilometres of the proposed development site. The distance and details of the conservation sites within 15km of the proposed development are seen in Table 5.3. No species of conservation importance were noted on site, based on NPWS and NBDC records. Utilising the NBDC online map viewer with a 2km x 2km grid selection and NPWS records, where the nearest grid surveys to the site were selected, the species listed in Table 5.2 were identified.

Barn Swallow *(Hirundo rustica)*; Black-billed Magpie *(Pica pica)*; Blackcap *(Sylvia atricapilla)*; Black-headed Gull *(Larus ridibundus)*; Blue Tit *(Cyanistes caeruleus)*; Bohemian Waxwing *(Bombycilla garrulus)*; Brambling *(Fringilla montifringilla)*; Chaffinch *(Fringilla coelebs)*; Coal Tit *(Periparus ater)*; Common Blackbird *(Turdus merula)*; Common Buzzard *(Buteo buteo)*; Common Coot *(Fulica atra)*; Common Kestrel *(Falco tinnunculus)*; Common Kingfisher *(Alcedo atthis)*; Common Linnet *(Carduelis cannabina)*; Common Moorhen *(Gallinula chloropus)*; Common Pheasant *(Phasianus colchicus)*; Common Pochard *(Aythya ferina)*; Common Snipe *(Gallinago gallinago)*; Common Starling *(Sturnus vulgaris)*; Common Whitethroat *(Sylvia communis)*; Common Wood Pigeon *(Columba palumbus)*; Eurasian Collared Dove *(Streptopelia decaocto)*; Eurasian Jackdaw *(Corvus monedula)*; Eurasian Sparrowhawk *(Accipiter nisus)*; Eurasian Tree Sparrow *(Passer montanus)*; Eurasian Wigeon *(Anas penelope)*; European Goldfinch *(Carduelis carduelis)*; European Greenfinch *(Carduelis chloris)*; European Robin *(Erithacus rubecula)*; Fieldfare *(Turdus pilaris)* ;Goldcrest (*Regulus regulus)*; Great Black-backed Gull *(Larus marinus)*; Great Cormorant *(Phalacrocorax carbo)*; Great Tit *(Parus major)*; Grey Heron *(Ardea cinerea)*; Hedge Accentor *(Prunella modularis)*; Herring Gull *(Larus argentatus)*; Hooded Crow *(Corvus cornix)*; House Martin *(Delichon urbicum)*; House Sparrow *(Passer domesticus)*; Lesser Black-backed Gull *(Larus fuscus)*; Lesser Redpoll *(Carduelis cabaret)*; Little Grebe *(Tachybaptus ruficollis)*; Long-tailed Tit *(Aegithalos caudatus)*; Mallard *(Anas platyrhynchos)*; Meadow Pipit *(Anthus pratensis)*; Mew Gull *(Larus canus);* Mistle Thrush *(Turdus viscivorus);* Mute Swan *(Cygnus olor);* Northern Lapwing *(Vanellus vanellus);* Peregrine Falcon *(Falco peregrinus);* Redwing (*Turdus iliacus);* Reed Bunting *(Emberiza schoeniclus);* Ring-billed Gull (*Larus delawarensis);* Rock Pigeon *(Columba livia);* Rook *(Corvus frugilegus);* Sky Lark *(Alauda arvensis);* Song Thrush *(Turdus philomelos);* Stonechat *(Saxicola torquata);* Tufted Duck *(Aythya fuligula);* White Wagtail *(Motacilla alba);* Whooper Swan *(Cygnus cygnus);* Willow Warbler *(Phylloscopus trochilus);* Winter Wren *(Troglodytes troglodytes);* Yellowhammer (*Emberiza citrinella);* Annual Mercury (*Mercurialis annua);* Black Medick (*Medicago lupulina);* Bulrush (*Typha latifolia);* Cleavers (*Galium aparine);* Coltsfoot (*Tussilago farfara);* Common Chickweed (*Stellaria media);* Common Dog-violet (*Viola riviniana);* Common Field-speedwell (*Veronica persica);* Cowslip (P*rimula veris);* Danish Scurvygrass (*Cochlearia danica);* Glaucous Sedge (*Carex flacca);* Ground-ivy (*Glechoma hederacea);* Hoary Ragwort (*Senecio erucifolius);* Hoary Willowherb (*Epilobium parviflorum);* Lesser Celandine (*Ranunculus ficaria);* Petty Spurge (*Euphorbia peplus);* Prickly Lettuce (*Lactuca serriola);* Pyramidal Orchid (*Anacamptis pyramidalis);* Red Dead-nettle (*Lamium purpureum); Taraxacum aggregate;* Wild Parsnip (*Pastinaca sativa);* Winter Heliotrope (*Petasites fragrans);* Wood Avens (*Geum urbanum);* Wood-sorrel *(Oxalis acetosella);* Yellow-wort (*Blackstonia perfoliata);* 14-spot Ladybird (*Propylea quattuordecimpunctata);* Common Blue *(Polyommatus icarus);* Green-veined White (P*ieris napi);* Holly Blue *(Celastrina argiolus);* Large White (*Pieris brassicae);* Orange-tip (*Anthocharis cardamines);* Peacock (*Inachis io);* Red Admiral (*Vanessa atalanta);* Ringlet (*Aphantopus hyperantus);* Small Tortoiseshell (*Aglais urticae);* Speckled Wood (*Pararge aegeria);* Migrant Hawker *(Aeshna mixta); Bombus (Bombus) lucorum; Bombus (Bombus) terrestris; Bombus lucorum agg.;* Common Carder Bee (*Bombus (Thoracombus) pascuorum);* Early Bumble *Bee (Bombus* (*Pyrobombus) pratorum);* Large Red Tailed Bumble Bee (Bombu*s (Melanobombus) lapidarius);* Small Garden Bumble Bee (*Bombus (Megabombus) hortorum); Anthophila fabriciana;* Brown House-moth (*Hofmannophila pseudospretella);* Dark Arches (*Apamea monoglypha);* Heart & Dart (*Agrotis exclamationis);* May Highflyer (*Hydriomena impluviata);* Birch Catkin Bug (*Kleidocerys resedae);* Birch Shieldbug (*Elasmostethus interstinctus*); Deraeocoris (*Deraeocoris) flavilinea;* Hawthorn Shieldbug (*Acanthosoma haemorrhoidale);* Parent Bug (Elasmucha grisea); Potato Capsid (*Closterotomus norwegicus); Eristalis tenax; Helophilus pendulus; Myathropa florea; Tipula paludosa; Volucella bombylans; Volucella bombylans subsp. Plumata; Araniella cucurbitina sensu lato; Xysticus cristatus;* Eurasian Badger (*Meles meles);* European Rabbit (*Oryctolagus cuniculus);* Pine Marten *(Martes martes);* Red Fox *(Vulpes vulpes);* West European Hedgehog *(Erinaceus eurpaeus)*

Table 5.2 Species Sighting as per NPWS and NBDC within 2km Grid

Name	Distance (km)	Type
Glenasmole Valley	4.1 km	SAC
Wicklow Mountains	6.5 km	SAC
Rye Water Valley / Carton	10.4 km	SAC
South Dublin Bay	11.3 km	SAC
Knocksink Wood	14.2 km	SAC
North Dublin Bay	14.4 km	SAC
Wicklow Mountains	8.1 km	SPA
South Dublin Bay and River Tolka Estuary	11.3 km	SPA
North Bull Island	14.4 km	SPA
Poulaphouca Reservoir	14.7 km	SPA
Sandymount Strand / Tolka Estuary	11.3 km	Ramsar
North Bull Island	14.6 km	Ramsar
Dodder Valley	2.3 km	pNHA
Grand Canal	3.2 km	pNHA
Lugmore Glen	3.5 km	pNHA
Glenasmole Valley	4.1 km	pNHA
Slade of Saggart and Crooksling Glen	5.8 km	pNHA
Liffey Valley	6.1 km	pNHA
Royal Canal	8.8 km	pNHA
Fitzsimon’s Wood	9.5 km	pNHA
Rye Water Valley / Carton	10.5 km	pNHA
South Dublin Bay	11.3 km	pNHA
North Dublin Bay	11.4 km	pNHA
Booterstown Marsh	11.5 km	pNHA
Kilteel Wood	12.1 km	pNHA
Dolphins, Dublin Docks	12.6 km	pNHA
Glencree Valley	13.7 km	pNHA
Santry Demesne	13.7 km	pNHA
Ballybetagh Bog	13.7 km	pNHA
Dingle Glen	14.1 km	pNHA
Knocksink Wood	14.1 km	pNHA
Poulaphouca Reservoir	14.7 km	pNHA
Red Bog, Kildare	14.9 km	pNHA

Table 5.3 Distance to Designated Sites of Conservation Importance (Natura 2000 Sites 15km, NHA 15km)

5.3.2 Terrestrial Ecology

5.3.2.1 Habitats and Species

Habitats encountered were classified according to Fossitt (2000) and are seen in Figure 5.6. Distinct habitats were noted and species detailed in Table 5.4. Bird species encountered on site were also noted (Table 5.5)

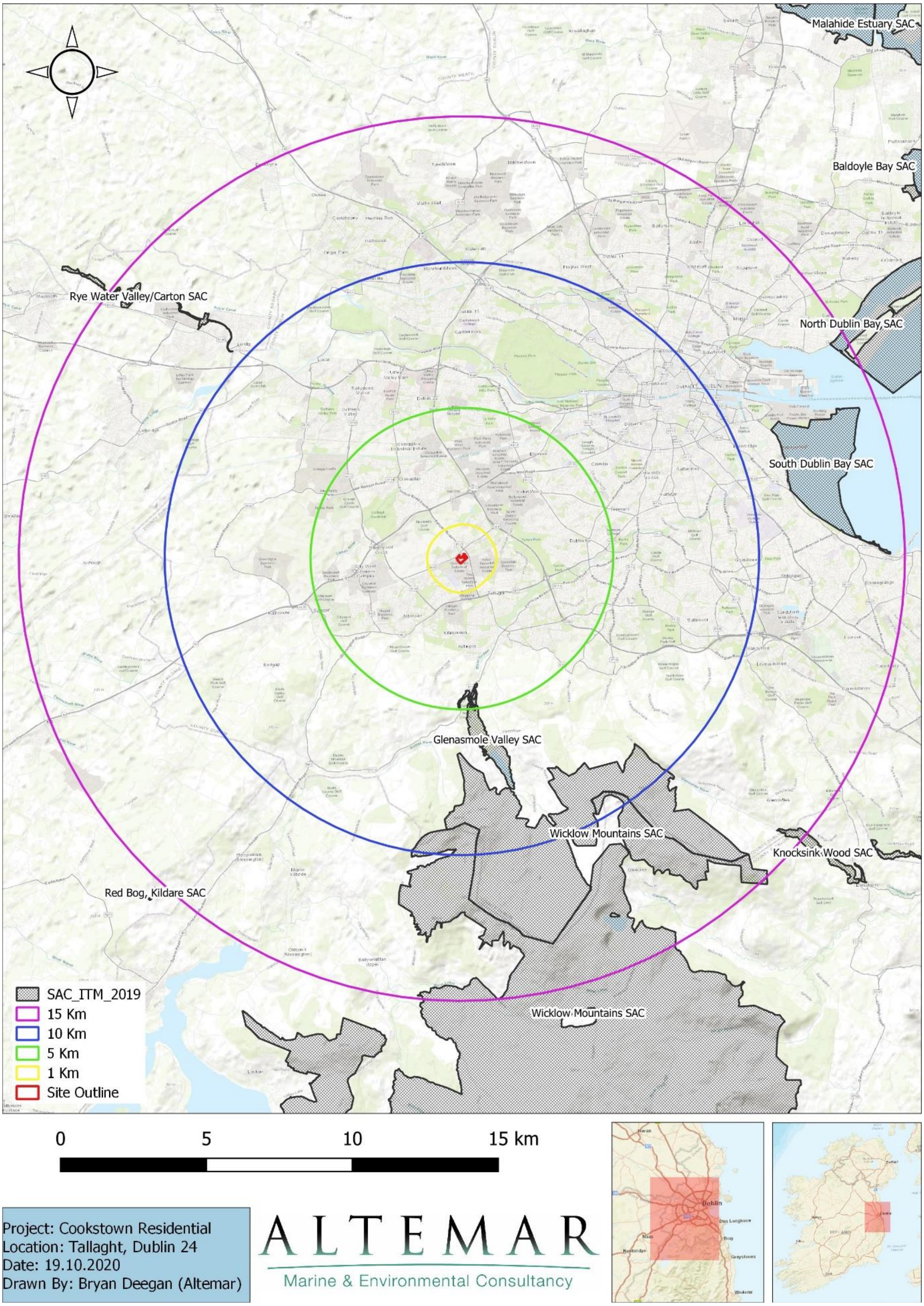


Figure 5.1 Special Areas of Conservation within 15km of the subject site

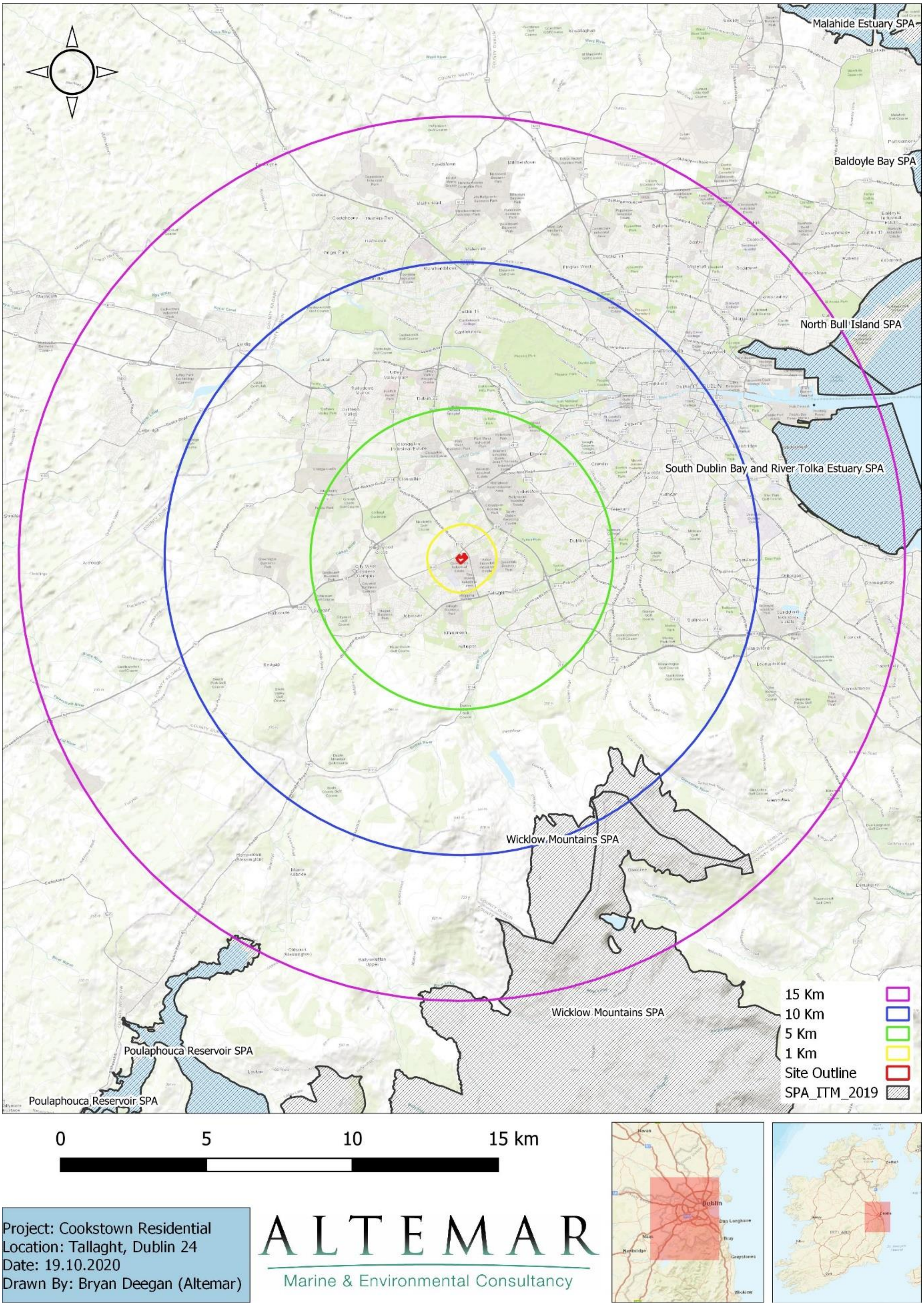


Figure 5.2 Special Protected Areas within 15km of the subject site

Figure 5.3 Waterbodies in proximity of the subject site

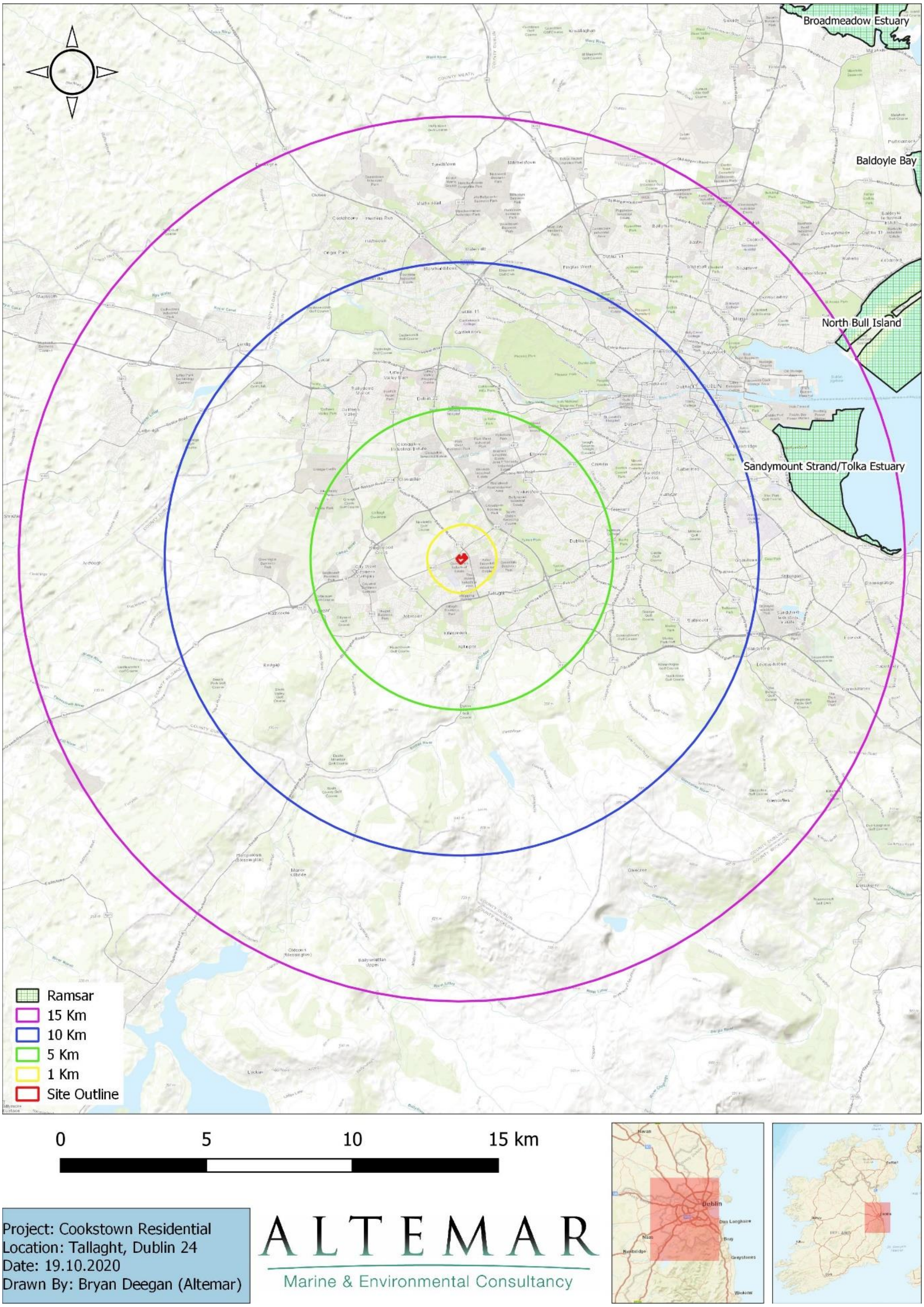


Figure 5.4 Ramsar sites within 15km of the subject site

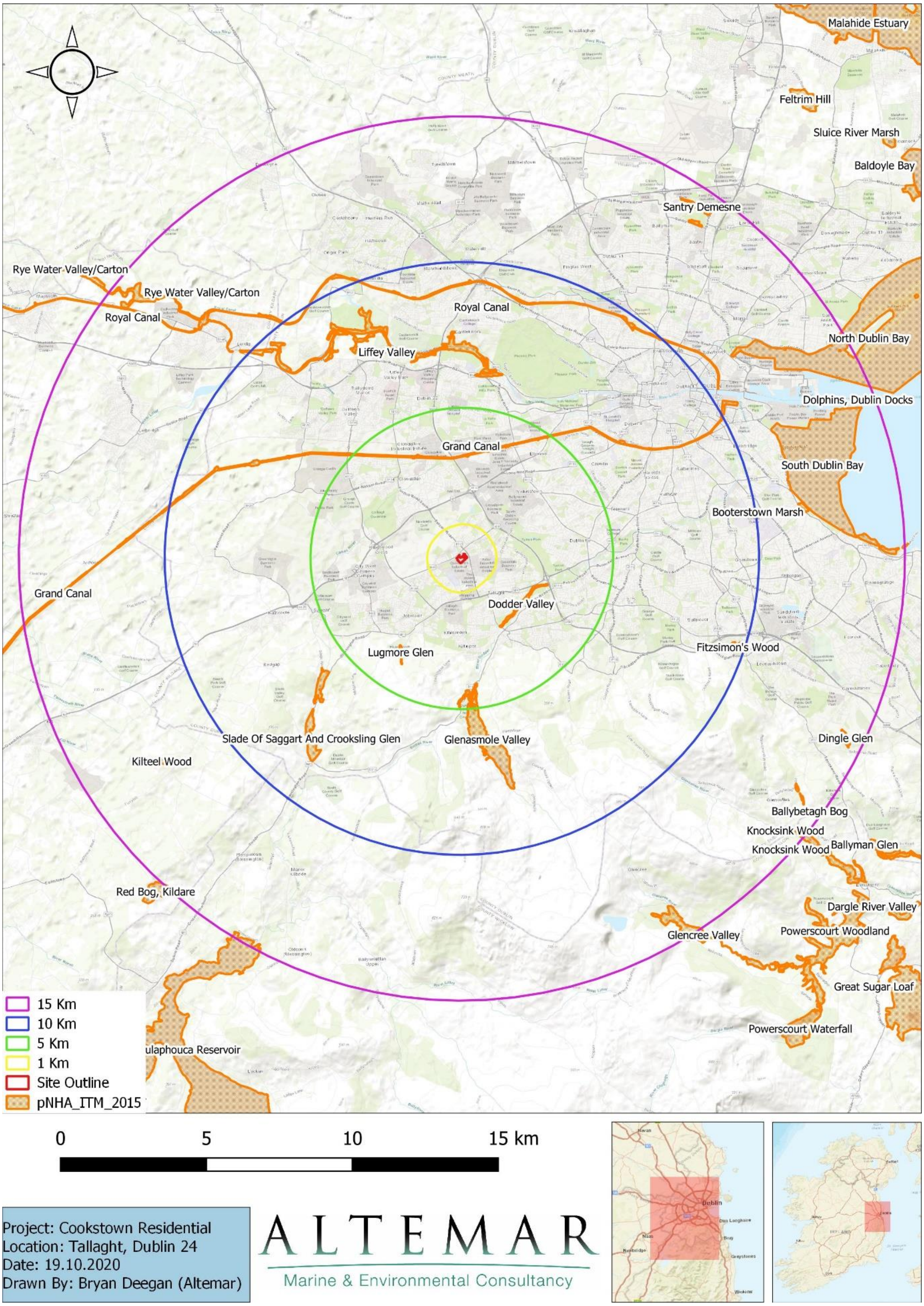


Figure 5.5. NHA and pNHA sites within 15km of the subject site

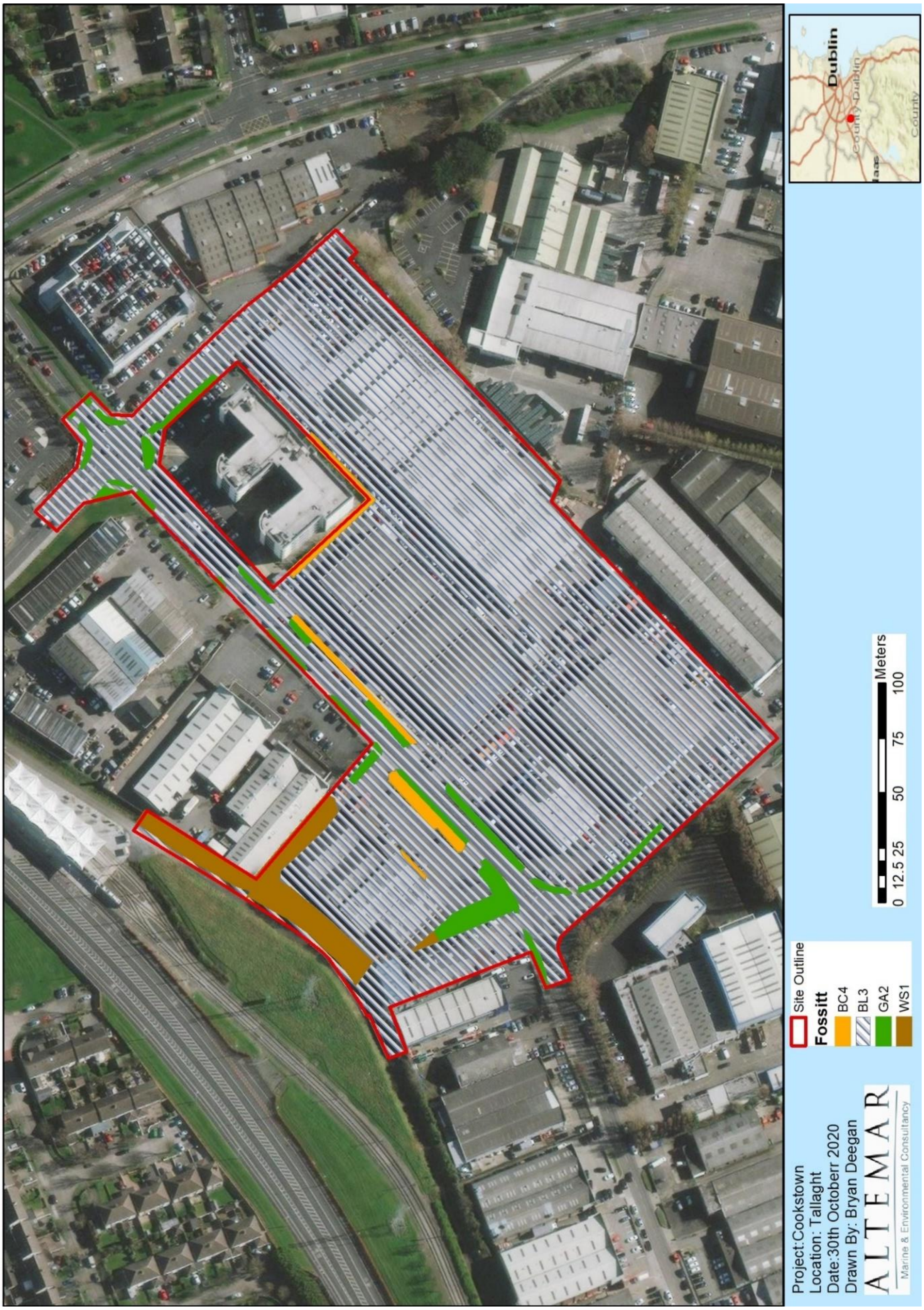


Figure 5.6. Fossitt (2000) habitats on site.

BL3

Buildings and artificial surfaces -The majority of the site (>90%) comprised of buildings and artificial surfaces which warehouses, a petrol station (to be retained), hardstanding roads, footpaths and other buildings. Opportunistic flora species had begun to grow in cracks and in areas at the edge of the hard standing areas. Species included bramble (*Rubus fruticosus agg*.), butterfly-bush (*Buddleja davidii*), cat's-ear (Hypochoeris radicata), lady's bedstraw (Galium verum), nettle (*Urtica dioica*), dandelion (*Taraxacum spp*.), rosebay willowherb (*Epilobium angustifolium*), plantains (*Plantago spp*.), thistles (*Cirsium arvense & C. vulgare*), docks (*Rumex spp*.). All buildings were inspected for bat presence. No evidence of bats utilising the buildings or foraging on site was noted.

GA2

Amenity grassland (improved) –Areas of GA2 (& Dry meadows and grassy verges GS2) were noted on site, primarily along the sided of the road. However, there were also some areas proximate to the warehouse buildings. The grassland areas within proximity to the warehouses was infrequently mowed. Species in GA2 consisted of hogweed (*Heracleum sphondylium*), creeping buttercup (*Ranunculus repens*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), dandelion (*Taraxacum spp*.), daisy (*Bellis perennis*), plantains (*Plantago spp*.), thistles (*Cirsium vulgare*), docks (*Rumex spp*.) and nettle (*Urtica dioica*).

WS1

WS1 (Scrub)

An area of Scrub was located in the north west corner of the site. This was located to the side and rear of a warehouse and contained a mixture of habitats that would have been originally planted as habitat BC4- (Fossitt, 2000) "Flower beds and borders" but had grown wild and unkempt. The majority of species in this area were non-native garden varieties including firethorn (*Pyracantha* sp), *Potentilla* sp, *Hypericum* sp and cotoneaster (*Cotoneaster sp*.), butterfly-bush (*Buddleja davidii*), sycamore (*Acer pseudoplatanus*) in addition to winter heliotrope (*Petasites pyrenaicus*), rape (*Brassica napus*), hedge bindweed (*Calystegia sepium*) and rose (Rosa sp.). However, one medium sized oak (*Quercus s*p) was noted in this area.

BC4	 *BC4- Flower beds and borders* Flowerbeds and borders were located at several locations across the site. Many of these areas were previously treated with herbicide. Species included non-native garden varieties including firethorn (Pyracantha sp), Potentilla sp, Hypericum sp and cotoneaster (Cotoneaster sp.), butterfly-bush (Buddleja davidii), Beneath the treeline vegetation included nettle (*Urtica dioica*), dandelion (*Taraxacum spp*.), plantains (*Plantago spp*.), thistles (*Cirsium arvense* & C. *vulgare*), colt's foot (*Tussilago farfara*), docks (*Rumex spp*.), ash (*Fraxinus excelsior*), ivy (*Hedera helix*) and Common Ragwort (Senecio jacobaea),

Table 5.4 Terrestrial Habitats and Floral Species Composition

The following bird species were noted on site.

Common Name	Scientific Name	Conservation Status
Herring Gull (on building roof) and on building. No juveniles noted.	*Larus argentatus*	Red-listed (90%breeding decline)
Robin	*Erithacus rubecula*	Green
Great Tit	*Parus major*	Green
Wren	*Troglodytes troglodytes*	Green
Blackbird	*Turdus merula*	*Green*
Rook	*Corvus frugilegus*	*Green*
Jackdaw	*Corvus monedula*	*Green*
Magpie	*Pica pica*	*Green*

Table 5.5 Species of Birds Noted During On-site Surveys

No flora or terrestrial fauna species or habitats of National or international conservation importance were noted on site during the surveys. As previously discussed no flora species of conservation importance were noted on site by the NPWS or NBDC. No amphibians or reptiles were noted on site. In relation to bird Species, no bird species on Annex I of the EU Birds Directive were noted on site by the NPWS or NBDC. Several herring gulls were observed on site on the buildings. These are red listed in Ireland.

Invasive Species

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

Discussion Terrestrial Species and habitats

As can be seen from Figure 5.6 the proposed development site consists primarily of Built Land (BL3) and Amenity Grassland (GA2) and WS1 (Scrub). No flora or terrestrial fauna species or habitats of National or international conservation importance were noted during the survey. As previously discussed, no flora or terrestrial fauna species of conservation importance were noted on site by NPWS or NBDC. In relation to bird species no bird species on Annex I of the EU Birds Directive were noted on site by NPWS or NBDC. However, it is expected that herring gulls frequent the site.

5.3.3 Bats

A bat survey of the buildings on site and a detector survey were carried out on site. A full examination of the buildings yielded no evidence of past or current bat presence. No sign of bats was observed on external walls or within buildings. All smooth-sided containers etc. were inspected for bat corpses but, none was found. No evidence of past or current use by bats of any of the onsite structures or trees was found when surveys were undertaken. No foraging was noted on site.

5.4 Do Nothing Scenario

The site appears to be suffering from a lack landscape maintenance. It is anticipated that should the proposed development not take place biodiversity value on site would increase assuming the maintenance continues to be neglected.

5.5 Likely Significant Effects

5.5.1 Demolition and Construction Phase

The proposed construction of the development, would potentially impact on the existing ecology of the site and the surrounding area. These potential construction impacts would include impacts that may arise during the site clearance, re-profiling of the site and the building phases of the proposed development. The proposed demolition of existing structures and development of the new onsite buildings will entail the loss of amenity grassland, built land as well as scrub and flower beds and borders. Potential Impacts are assessed below for each of the ecological components.

5.5.2 Designated Conservation Sites

The proposed development is not within a designated conservation site and the nearest conservation site (Dodder Valley pNHA) is 2.3 km from the proposed development across an urban environment and is not hydrologically connected to the proposed development site. It should be noted that the nearest Natura 2000 site (Glenasmole Valley SAC) is 4.1 km from the proposed development and is not hydrologically connected to the proposed development site. There is no direct pathway to Natura 2000 sites. Standard construction phase controls will be in place to comply with Water Pollution Acts.

<u>Impacts: Neutral/Imperceptible/localised/unlikely</u>

5.5.3 Ecology

The impact of the development during construction phase will be a loss of existing habitats and species on site. It would be expected that the fauna associated with these habitats would also be displaced. During the site visits no flora, amphibian or mammal species of conservation importance were recorded on site or in NPWS or NBDC records. Common mammalian species. Loss of habitat and habitat fragmentation may affect some common mammalian species and there is expected to be mortality during construction. Small mammals such as house mouse, brown rat, and protected species such as pygmy shrew and hedgehog may be directly impacted. Amphibians and reptiles. Frogs and reptiles were not observed on site - There are a no pond / wet ditch areas within the study area. A pre-construction survey for Herring gull should be carried out if within the bird nesting season.

Impacts: Neutral/ Short-term, imperceptible, localised, unlikely

Bat Fauna

No evidence of past or current use by bats of any of the onsite structures or trees was found. The removal of the existing buildings will have no negative impacts on bats as the structures are not in use by these animals. No foraging was noted on site. The current site is brightly lit.

Impacts: Neutral/localised/unlikely

Operational Phase

Limited SUDS drainage is currently present on site with a significant un-attenuated hardstanding and roof areas. Following construction all surface water runoff will comply with SUDS. The biodiversity value of the site would be expected to improve as the landscaping matures. Surface water discharge from site will be developed in accordance with the requirements of the Drainage Division as set out in the Greater Dublin Strategic Drainage Study's 'Technical Document on New Development' with regard to SUDS and Water Pollution Acts. The proposed development site is within a significant urban area with both domestic and industrial pressures. During operation surface water would be connected to the public surface water network, while foul sewers will also connect to the existing network.

Operational Impacts: Positive, Moderate, localised, likely; Permanent

5.5.4 Designated Conservation sites

Currently this substantial site has limited attenuation or SUDS control. The proposed development has a sustainable drainage strategy. This will improve the drainage network, particularly during extreme weather events. The development will comply to SUDS and pollution control requirements including the Water Pollution Acts and measures will be in place to prevent downstream impacts. No significant impacts on designated sites are likely. The accompanying AA Screening found that no significant effects are likely for all Natura 2000 sites within 15km. No significant impacts on designated sites are likely.

Operational Impacts: Neutral/Localised Ecology

The proposed development has a sustainable drainage strategy. This will improve the drainage network, particularly during extreme weather events. Biodiversity value of the site will improve as landscaping matures.

Operational Impacts: Positive, Moderate, localised, likely; Permanent

Bat Fauna

The proposed development will change the local environment as new structures are to be erected in place of the existing buildings, new roads and parking areas constructed and some of the existing vegetation will be removed. The removal of the onsite buildings will not negatively impact bats as none are present. No bat roosts will be lost due to this development and the site is currently not being used for bat foraging.

Operational Impact: Neutral; localised

5.5.5 Cumulative

The proposed development site is mostly brownfield, with operational industrial and commercial premises also onsite, and it exists within a developed urban area.

There were no significant planning permissions identified in proximity to the subject site, with details of those permissions in the AA Screening report.

The foul and combined sewers terminate at Ringsend Waste Water Treatment Plant (WWTP). The foul water from the site will transfer to the Ringsend WWTP via public foul sewer where it will be diluted and mixed with other effluent. Treatment will take place at Ringsend WWTP prior to discharge into Dublin Bay.

Note that as part of this WWTP application an Environmental Impact Assessment Report (EIAR) was submitted. Sections 5 and 6 of this EIAR related to Marine Biodiversity and Terrestrial Biodiversity respectively and each contained a section on the ‘do nothing scenario’. These review the effects to biodiversity in Dublin Bay in the absence of the upgrade works.

“If the status quo is maintained there will be little or no change in the majority of the intertidal faunal assemblages found in Dublin Bay which would likely continue to be relatively diverse and rich across the bay . Previous studies suggest that the outer and south bays are largely unaffected by the nutrient inputs from the WwTP at Ringsend and from the Liffey and Tolka rivers. Therefore, the sandy communities found in those areas will likely remain dominated by the same assemblage of Nepthys, tellinids and other pollution-sensitive species, albeit subjected to natural spatial and seasonal variations.

However, the areas in the Tolka Estuary and North Bull Island channel will continue to be affected by the cumulative nutrient loads from the river Liffey and Tolka and the effluent from the Ringsend WwTP. These areas will likely continue to be colonised by opportunistic taxa tolerant of organic enrichment. There is a possibility that an increase in the nutrient outputs from the plant due to the operational overload and storm water discharges could result in a decline in the biodiversity of these communities as a result of low oxygen availability caused by increased organic enrichment. Considering the existing situation, it is possible that through the future oversupply of DIN to the area impacted by the existing outfall, benthic production could be adversely impacted due to hypoxic or even anoxic conditions. An increase in the cover of opportunistic macroalgae could lead to further deterioration in the lagoons in the North Bull as they add to the organic load on the benthos and further increase the BOD. These events, although localised, could deteriorate the biological status for Dublin Bay as a whole. Nonetheless, it is unlikely, as existing historical data suggests that pollution in Dublin Bay has had little or no effect on the composition and richness of the benthic macroinvertebrate. Although a localised decline could occur, it is not envisaged to be to a scale that could pose a threat to the shellfish, fish, bird or marine mammal populations that occur in the area. (Section 5.7.1)

If the Proposed WwTP Component is not implemented, there is a possibility that an increase in the nutrient outputs from the plant due to operational overload and storm water discharges could result in a decline in the biodiversity of invertebrate communities in the Tolka Estuary and North Bull Island channel as a result of low oxygen availability caused by increased organic enrichment.

An increase in the cover of opportunistic macroalgae could lead to further deterioration in the lagoons in the North Bull as they add to the organic load on the benthos and further increase the BOD. These events, although localised, could deteriorate the biological status for Dublin Bay as a whole. It is unlikely that they would have any significant impact on the waterbird populations that forage on invertebrates in Dublin Bay.

A graphic from the EIAR prepared by Irish Water in 2018 showed the zone of influence of the discharge from the Ringsend WwTP and this indicated that effects from the discharge do not extend to the south side of the bay.”

In addition, a separate WWTP at Clonshaugh with a 500,000 PE capacity has received planning (November 2019). This will increase capacity within the Greater Dublin Area to 2.9 million PE.No cumulative or in combination effects on Natura 2000 sites are foreseen.

Cumulatively, these other proposals will not significantly effect biodiversity. Therefore, the significance of the impact of the proposed development, is imperceptible and is considered not to change in combination with the other projects.

As observed in the AA Screening no significant impacts are likely on Natura 2000 sites, alone in combination with other plans and projects based on the implementation of standard construction phase mitigation measures. The construction and presence of this development would not be deemed to have a significant cumulative impact.

Cumulative Impact: Neutral; Slight; Temporary, localised.

5.5.6 Worst Case Scenario

Following construction, fire or building collapse would be seen as the main potential worst case scenario risk to biodiversity, conservation sites and human health, with localised and potential airborne and potential for impact. Based on the predominantly residential or mixed residential-commercial nature of proposed development, it is not expected that significant quantities of toxic/polluting materials would be stored on site. Having regard to the scale of the development, a significant fire would release airborne and waterborne pollutants due to the combustion of normally inert household materials and appliances. Water used in a significant fire could contain toxic materials that would enter the surface water drainage network.

Worst Case Scenario Impacts: Unlikely, Negative, Slight, localised, Temporary. Mitigation required

5.5.7 Summary

The Table below summarises the identified likely significant effects of the proposed development in the absence of mitigation during the demolition and construction phase.

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
	e.g. positive, neutral, negative	e.g. imperceptible, not signifiant etc.	e.g. site specific, local, regional etc.	e.g. Likely/Unlikely	e.g. Brief, Temporary etc.	e.g. indirect, cumulative etc.
Construction						
Designated Conservation Sites	Neutral	imperceptible	Local	Unlikely	Temporary	indirect
Ecology (species and habitats of conservation value)	Neutral	imperceptible	Local	Unlikely	Temporary	indirect
Operation						
Designated Conservation Sites	Neutral	imperceptible	Local	Unlikely	Temporary	indirect
Ecology (species and habitats of conservation value)	Overall Positive	Slight	Local	Likely	Permanent	direct

Table 5.6 Summary of Demolition & Construction Phase Likely Significant Effects without Mitigation

5.6 Mitigation

Standard construction and operational controls will be incorporated into the proposed development project to minimise the potential impacts on the ecology within the ZOI.

5.6.1 Incorporated Design Mitigation

Standard SUDS drainage and measures such as green roofs, permeable paving, attenuation storage and flow control devices are included on site with petrochemical interception included in the design and will be managed in accordance with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS). No additional mitigation measures are incorporated in the design.

5.6.2 Demolition and Construction Phase Mitigation

Standard construction and operational controls will be incorporated into the proposed development project to minimise the potential negative impacts on the ecology within the ZOI. These measures are outlined below in sequence and are designed to incorporate elements outlined elsewhere in this EIAR. A Demolition & Construction Phase Surface Water Management Plan will be implemented.

Designated Conservation sites

There is no direct pathway to conservation sites. However, there is an indirect pathway to the Ringsend WWTP. During construction standard construction phase controls will be in place to remove silt and petrochemicals prior to discharge of surface water to the existing combined sewer which discharges to Ringsend WWTP. Additional treatment will take place in Ringsend WWTP. No additional controls are required besides those outlined below, during the construction and operational phases of the development, to mitigate against potential negative impacts on designated conservation sites. The mitigation has been designed to ensure that the project will comply with the Water Pollution Acts in relation to construction and drainage. All measures outlined below will be followed.

Development Construction

- Relevant guidelines and legislation (Section 40 of the Wildlife Acts, 1976 to 2012) in relation to the removal of trees and timing of nesting birds will need be followed e.g. do not remove trees or shrubs during the nesting season (1st March to 31st August). Pre construction monitoring should be carried out for nesting herring gulls and relevant guidance followed including consultation with NPWS if nesting Herring gulls are found on site.
- Construction operations outside of daylight hours should be kept to a minimum in order to minimise disturbance to fauna in addition to roosting bird species.
- Native species should be chosen in all landscaping schemes. Planting schemes should attempt to link in with existing wildlife corridors (hedgerows and treelines), both onsite and off, to provide continuity of wildlife corridors.
- Staging of project to reduce risks to drainage networks from contamination.
- All water leaving the site during construction will be desilted using standard techniques including silt buster/silt socks etc.
- During demolition and enabling works all surface water from site will go to foul following desilting. All surface/pumped water will go to foul until the surface water infrastructure is complete, flow controls installed and inspected.
- Desilting and petrochemical interception of all surface runoff/pumped water will take place for the length of the construction project.
- A petrochemical interceptor will be placed on the surface water network prior to discharge.
- Local silt traps established throughout site.
- Mitigation measures on site include dust control, stockpiling away from watercourse and drains
- Stockpiling of loose materials will be a minimum of 20m from drains.
- Stockpiles and runoff areas following clearance will have suitable silt barriers to prevent runoff of fines into the drainage system.
- Fuel, oil and chemical storage will be sited within a bunded area. The bund will be at least 50m away from drains, excavations and other locations where it may cause pollution.
- Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. Any water-filled excavations, including the attenuation tank during construction, that require pumping will not directly discharge to the surface water network. Prior to discharge of water from excavations adequate filtration and petrochemical interception will be provided to ensure no deterioration of water quality and ensure compliance with the Water Pollution Acts.
- Site layout during excavation works will be designed to ensure vehicles do not enter the works area unless necessary for the excavation and soil removal processes. All machinery leaving the works area will be thoroughly cleaned before being allowed on to public roads. A road sweeper (including vacuum) will be in place (as required) to unsure cleanliness of nearby and haul roads (where necessary), particularly during enabling works.
- Dust may deposit on surrounding roads thus entering into the surface water network. Effective site management regarding dust emissions will be carried out.
- Plant refuelling activities. Oil/diesel spillages and risk of ground and surface water contamination. All mobile plant to be refuelled in a central refuelling area in a compound where a spillage containment sump will be constructed within the refuelling area. All collected fuel will be disposed offsite under license. A record of all spillages will be kept and monitored.

- Herring gulls were noted on site and as a precaution it is advised that mitigation is in place in relation to this species.
- Lighting during construction should not spill outside the proposed development.
- The effectiveness of the proposed mitigation should be monitored throughout the construction period.

Human Health and Accidents & Disasters

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

5.6.3 Operational Phase Mitigation

No significant effects are predicted for the operational phase thus mitigation measures are not proposed.

5.7 Residual Impact Assessment

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

The overall impact on the ecology of the proposed development will result in a long term positive residual impact on the ecology of the site and locality overall. This is primarily as a result of the implementation of SUDS measures on site, supported by the creation of additional biodiversity features and sensitive native landscaping strategy.

5.8 Summary of Mitigation and Monitoring

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

Likely Significant Effect	Mitigation	Monitoring
Silt and petrochemicals	Filtering of surface water prior to discharge to combined sewer. Dust and silt control measures.	During construction phase only
Nesting Birds	Compliance with Section 40 of the Wildlife Acts, 1976 to 2012	Pre construction monitoring for Herring Gulls prior to demolition.

Table 5.7 Summary of Demolition & Construction Phase Mitigation and Monitoring

6.0 LAND, SOILS AND GEOLOGY

6.1 Introduction

This section presents an assessment of the impact of the proposed mixed-use residential development in Cookstown Industrial Estate, Dublin 24, on the land, soils and geology of the local environment as defined in the Environmental Protection Agency (EPA, 2017) Guidelines.

The assessment of the impacts is also in accordance with the Institute of Geologists (IGI) *'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements*' (IGI, 2013).

In assessing the likely potential and predicted impacts on the land, soils and geology, account has been taken of both the importance of the attributes and the predicted scale and duration of the likely impacts.

The author of this Chapter is Greg Daly (FConsEI BScEng CEng MIEI MIStructE MCIArb MBA) of GDCL Consulting Engineers - a Chartered Professional Engineer with over 35 years' experience in the design and construction of civil engineering projects, including developments associated with residential, commercial, industrial and public infrastructure sectors.

6.2 Research Methodology

The rating of potential environmental impacts on the land, soils and geology environment is based on the Impact Classification Terminology presented in the EPA document *Guidelines on the information to be contained in the Environmental Impact Statements* and the TII document *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* which take account of the quality, significance, duration and type of the impact characteristic identified.

In the EIAR assessment, consideration is given to both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed activities on that attribute.

The principal attributes (and impacts) to be assessed include the following:

- Geological heritage sites in the vicinity of the perimeter of the subject site;
- Landfills, industrial sites in the vicinity of the site and the potential risk of encountering contaminated ground;
- The quality, drainage characteristics and range of agricultural uses of soil around the site;
- Quarries or mines in the vicinity, the potential implications (if any) for existing activities and extractable reserves;
- The extent of topsoil and subsoil cover and the potential use of this material on site as well of requirement to remove it off-site as waste for disposal or recovery;
- Classification (regionally important, locally important etc) and extent of aquifers underlying the site perimeter area and increased risks presented to them by the proposed development associated with aspects such as for example removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes, change in groundwater quality;
- Natural hydrogeological/karst features in the area and potential for increased risk presented by the activities at the site;
- Loss of agricultural and amenity lands.

6.3 Sources of information

A desk study of the site was carried out to obtain information from publicly available data on the overburden and bedrock in the vicinity of the site. The information was obtained through the following sources:

- Geological Survey of Ireland (GSI) – website mapping;
- Teagasc soil and subsoil database;
- Ordnance Survey Ireland-aerial photographs and historical mapping;

- Environmental Protection Agency (EPA) – website mapping and database information;
- National Parks and Wildlife Services (NPWS) – Protected Site Register;

Site specific data was derived from the following sources:

- Design site plans and drawings.
- Site investigations

6.4 Existing Environment

6.4.1 Site Description

The proposed development is located in Cookstown Industrial Estate, Dublin 24 on the lands west of Old Belgard Road and north, south and west of Cookstown Road, Tallaght, Dublin 24 (see Figure 6.1). The development is located approximately 750m northeast of Tallaght Hospital and can be accessed from Old Belgard Road and Cookstown Road, the latter separating Block A to the north from Block B, C and D to the south. The Belgard Stop of the Luas Red line is located approx. 100m north of the site. The ground level within the site slopes down gently from west to east.

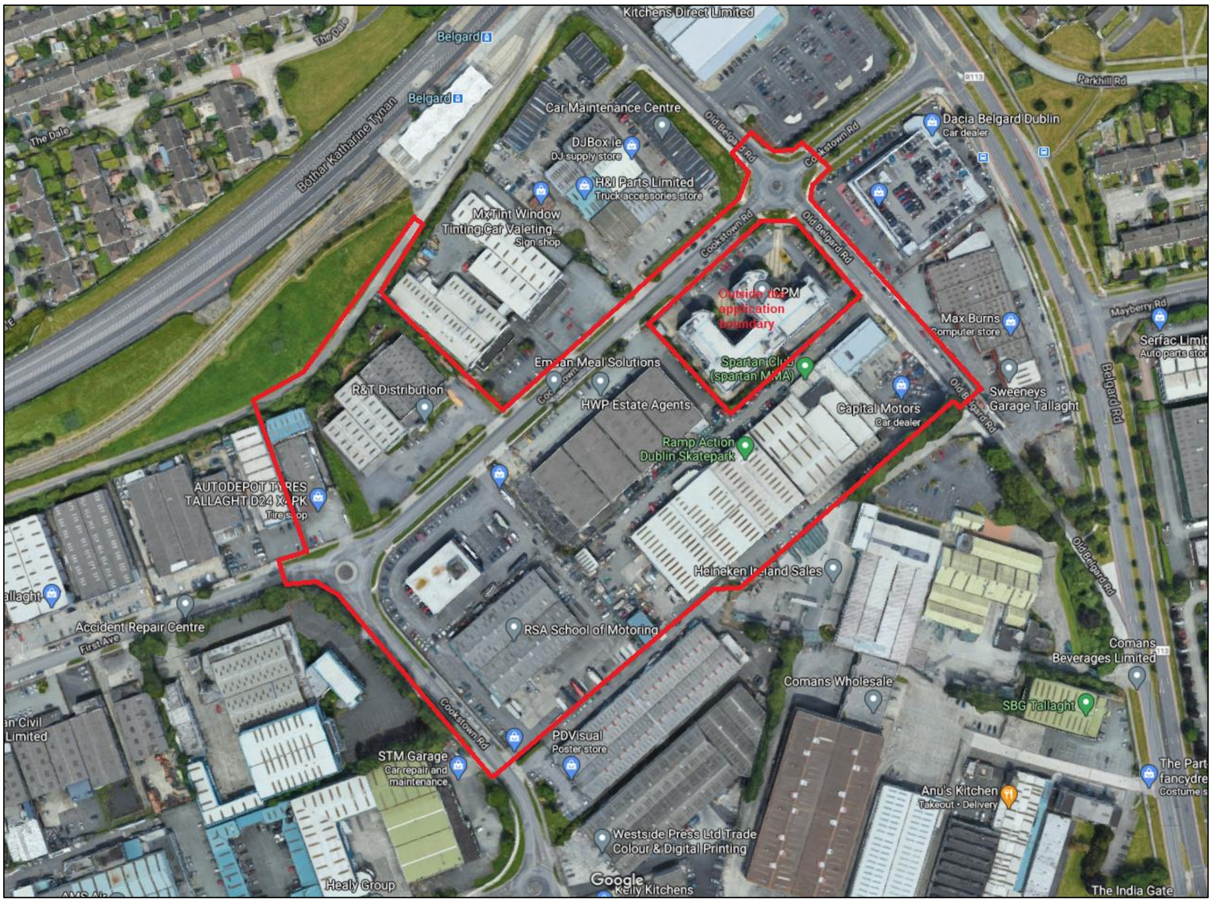


Figure 6.1 Site Location

6.4.2 Land Use

The proposed development is situated within an industrial area and currently consists of warehouses with surface parking and paved areas. A fuel station is located off the Old Belgard Road, adjacent to the eastern site boundary. The surrounding areas consist of warehouses, commercial and industrial units. The luas line is approx. 100m north of the site. To the north of the luas line tracks lies residential development and green fields.

6.4.3 Historical Land Use

The site is currently within an industrial estate. Based on the OSI historical maps, the land was previously used for agricultural purposes between circa 1888-1913 (Figure 6.2). Aerial views dated 1995 from the OSI database shows the existing industrial development (Figure 6.3). Therefore, the land was developed within this time period.

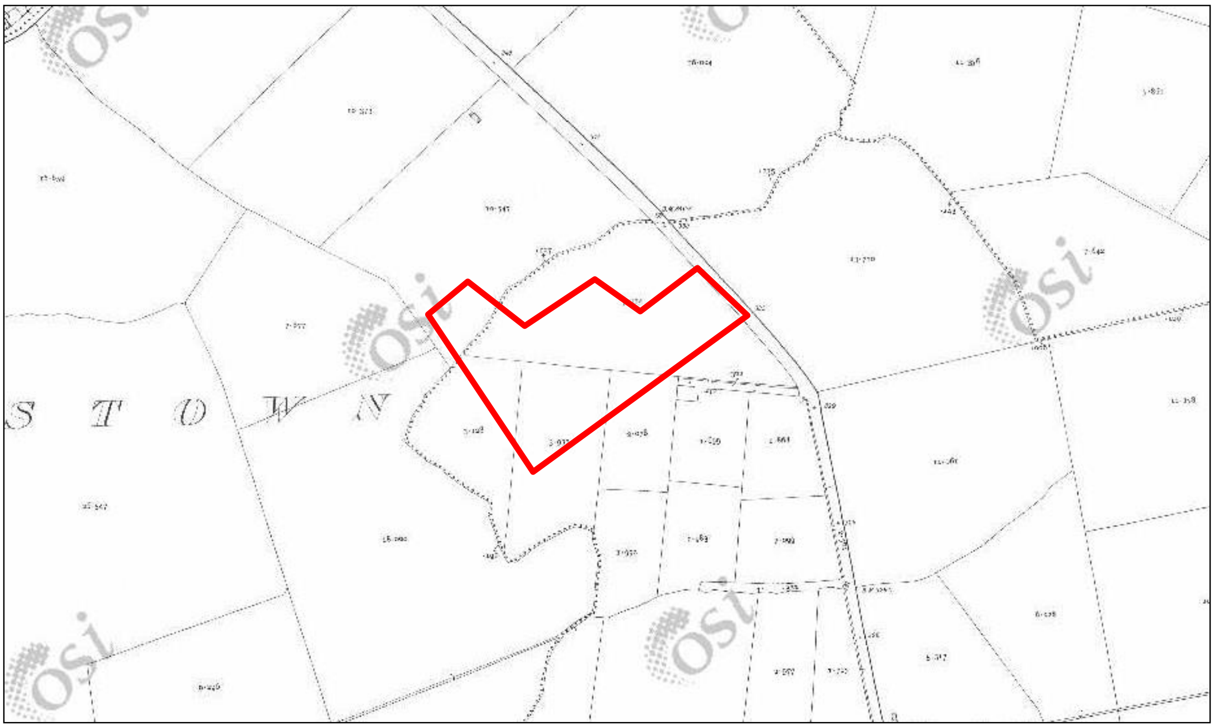


Figure 6.2 25 inch historical map (1888-1913) (OSI)-Site location is shown in red

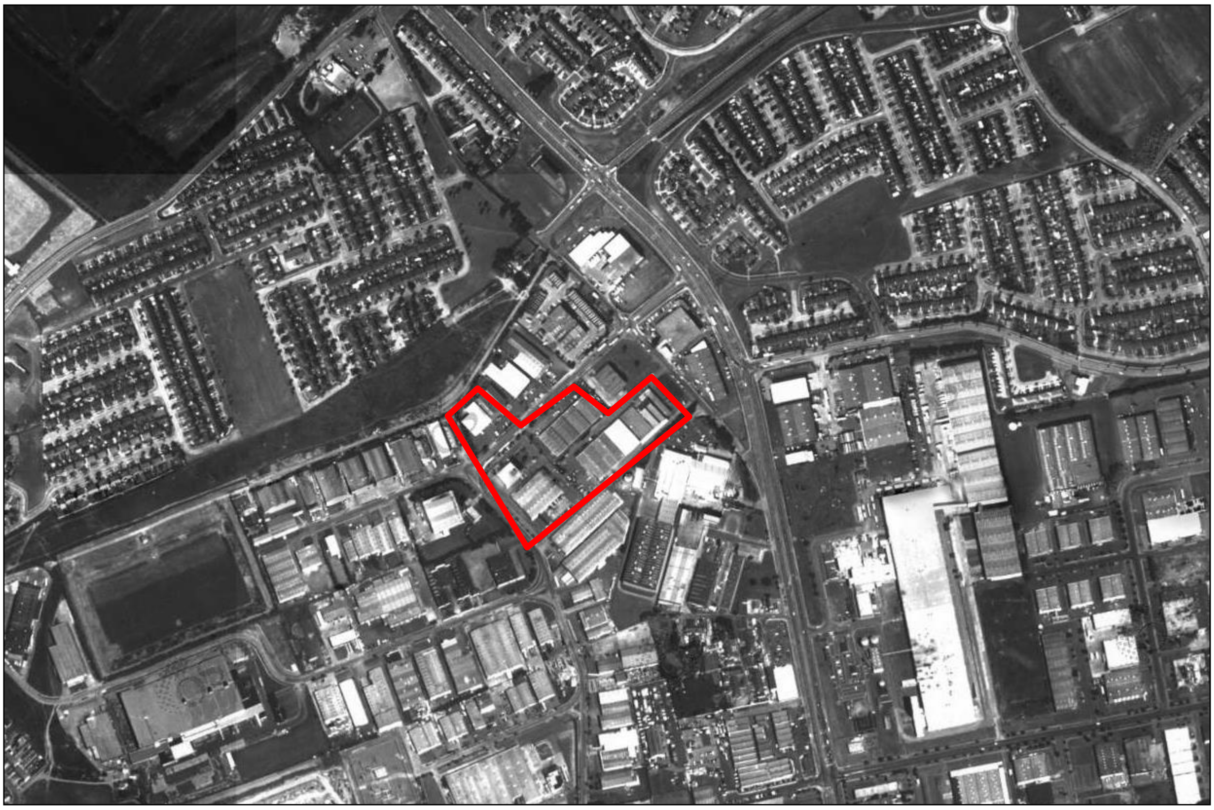


Figure 6.3 1995 Aerial view (OSI)-Site location is shown in red

6.4.4 Soils & Subsoils

The GSI (2020) quaternary map indicates that the overburden in the vicinity of the site consists of till derived from Limestone (TLs) with rock outcrops located further afield to the west and north of the site, as shown in Figure 6.4. The GSI Teagasc Map indicates that the site and the immediate surrounding areas are covered by Made Ground (Figure 6.5). Areas located further afield to the north-west and south-east are shown to be covered by a mix of deep well drained mineral soils (BminDW) and poorly drained mineral soil (BminPD) as well as shallow rocky peaty/non-peaty mineral complex (BminSRPT).

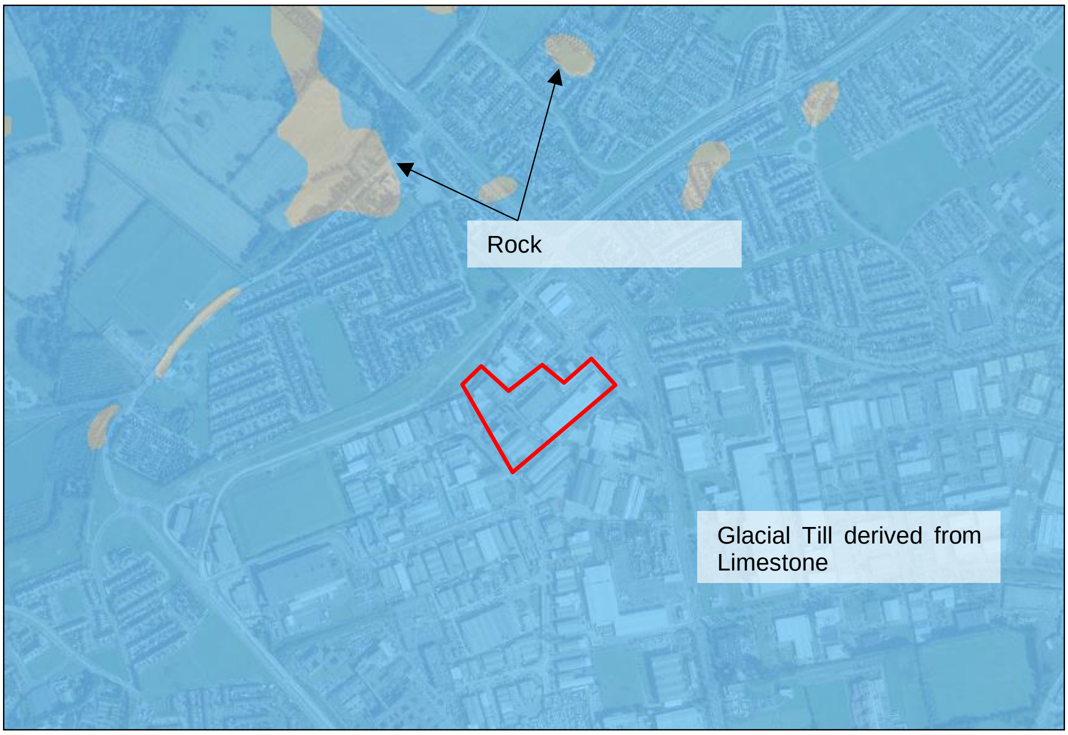


Figure 6.4 Quaternary Map (GSI) – Site location is shown in red

Figure 6.5 Teagasc Map (GSI)-Site location is shown in red

6.4.5 Bedrock Geology

As shown on the GSI Bedrock Map, the site and the surrounding areas are underlain by the Lucan Formation (LU) which is described as 'Dark Limestone and Shale (Calp)' (Figure 6.6Figure *6.6*). No geological faults are reported in the area. The hatched areas to the north and west of the site represent rock outcrops which are consistent with the location of the rock outcrops identified on the GSI subsoils map.

Figure 6.6 Bedrock Map (GSI) – Site location is shown in red

6.4.6 Karst Features

There are no karst features identified in the vicinity of the site.

6.4.7 Geological Heritage

The GSI databases indicates that there are no geological heritage sites within the proposed development. The map identifies 2 no. geological heritage sites in the vicinity of the site, namely the Belgard Quarry at a distance of approx. 1km west of the site and the Greenhills Esker at approx. 1.8km north-east of the site (see Figure 6.7).

6.4.8 Economic Geology

The GSI data base was consulted to determine whether there were any quarries or mineral sites in the vicinity of the site. There are no active extractive or mineral sites located on the site.

The nearest active extractive site is the Belgard Quarry which is located approx. 1km west of the proposed development and is described as a large active quarry (see Figure 6.7Figure *6.7*). The quarry produces aggregates and fill materials by the process of excavator, blasting, crushing, grading, fixed plant, washing and screening, mobile plant. The mineral being extracted from the site is described as a siliceous argillaceous limestone.

Figure 6.7 Geological Heritage Sites Map (GSI) – Site location is shown in red

6.4.9 Geohazards

There have been no recorded landslide events at the site. Due to the generally flat topography in and in the vicinity of the site and the ground conditions in the area, there is a negligible risk of a landslide event occurring at the site.

The seismic activity in Ireland is measured by the Irish National Seismic Network through the six permanent seismic stations located along the coastlines of Ireland. Ireland is not within an active seismic zone and only experiences sporadic and relatively low magnitude seismic activity. Therefore, the site would not be at risk of experiencing an earthquake.

There are no active volcanoes in Ireland, therefore, there is no risk from volcanic activity.

6.4.10 Hydrogeology

Groundwater can be defined as water that is stored in, or moves through, pores and cracks in within the soil/rock. The rate at which ground water can flow within the soil/rock depends on the permeability of the soil and the presence of fissures/fracture rock within the rock. Aquifers are permeable bodies of soil/rock that store large quantities of water below ground level.

The GSI classifies the principal aquifer types in Ireland as:

BEDROCK AQUIFER

- Lk-Locally Important Aquifer-Karstified
- Ll-Locally Important Aquifer-Bedrock which is Moderately Productive only in Local Zones
- Lm-Locally Important Aquifer-Bedrock which is Generally Moderately Productive
- Pl-Poor Aquifer-Bedrock which is Generally Unproductive except for Local Zones
- Pu-Poor Aquifer-Bedrock which is Generally Unproductive
- Rkd-Regionally Important Aquifer (karstified diffuse)

GRAVEL AQUIFER

- Lg-Locally Important Aquifer-Sand & Gravel
- Rg-Regionally Important Aquifer-Sand & Gravel

The GSI (2020) currently classifies the bedrock aquifer underlying the site as a **(LI) Locally Important Bedrock Aquifer** which is **Moderately Productive only in Local Zones** (see Figure 6.8).

Figure 6.8 Bedrock Aquifers Map (GSI) – Site location is shown in red

6.4.11 Aquifer Vulnerability

Aquifer vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures/ fractures, the main feature that protects groundwater from contamination, and therefore the most important feature in the protection of groundwater, is the subsoil (which can consist solely of/ or of mixtures of peat, sand, gravel, glacial till, clays or silts).

The GSI (2020) presently classifies the bedrock aquifer in the region of the site as having High (H) to Extreme (E) vulnerability status as shown on Figure 6.9Figure 6.9.

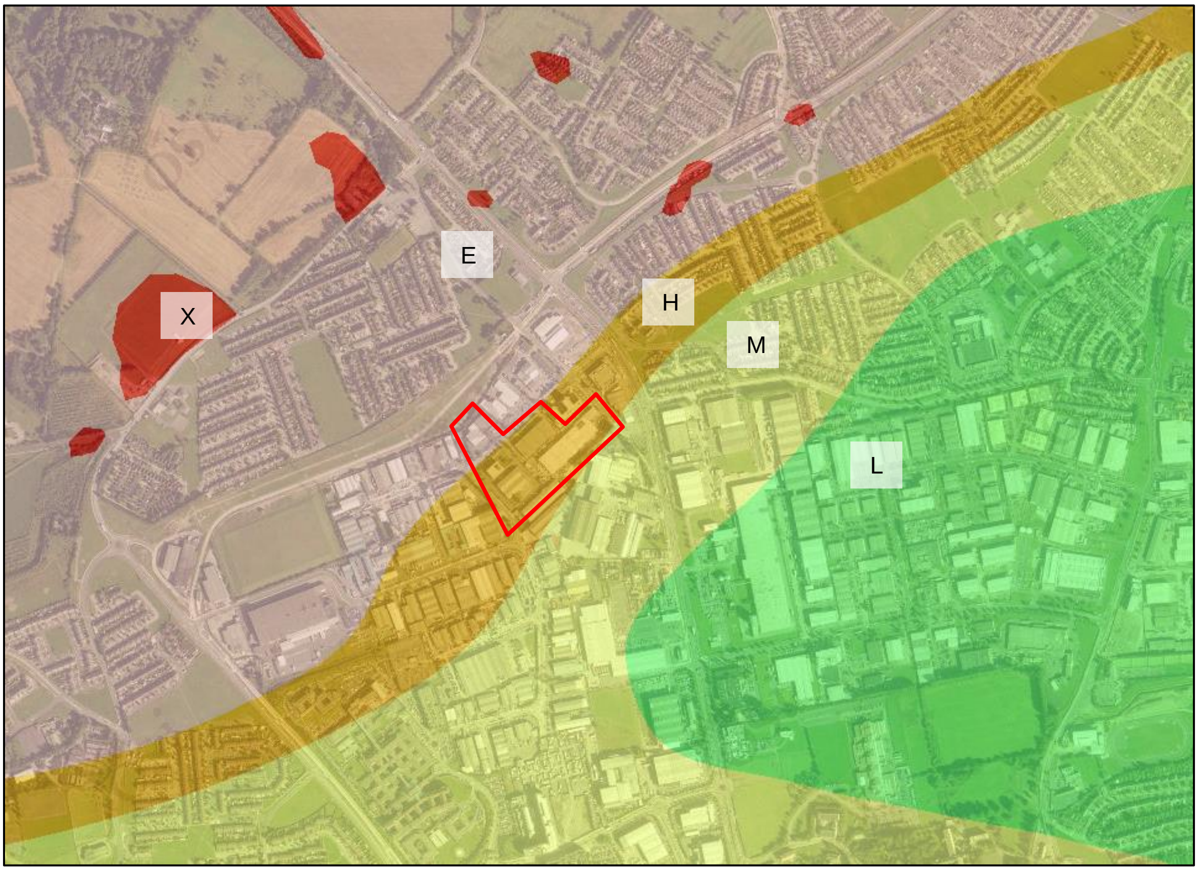


Figure 6.9 Bedrock Aquifers Vulnerability Map (GSI) – Site location is shown in red

6.4.12 Groundwater

Groundwater levels were taken in the standpipes installed during the 2020 RSK Ground investigation. These levels are reported on Table 6.1 and indicate that groundwater flow at the site may be estimated to be in a south-westerly direction.

Location	GW depth (mbgl)	GW elevation (mOD)
MW101	Dry	-
MW102	2.1	97.7
MW103	2.1	97.7
MW104	1.9	97.8
MW105	1.9	97.8

Table 6.1 GW monitoring results

6.4.13 Groundwater Wells

The groundwater abstraction well nearest to the site is located approx. 400m south of the proposed development (see Figure 6.10). This well is used for industrial purposes and is reported to have diameter of 254mm, a length of 35m and a yield of 513 m3/day which classifies as ‘Excellent’ in the GSI yield class.

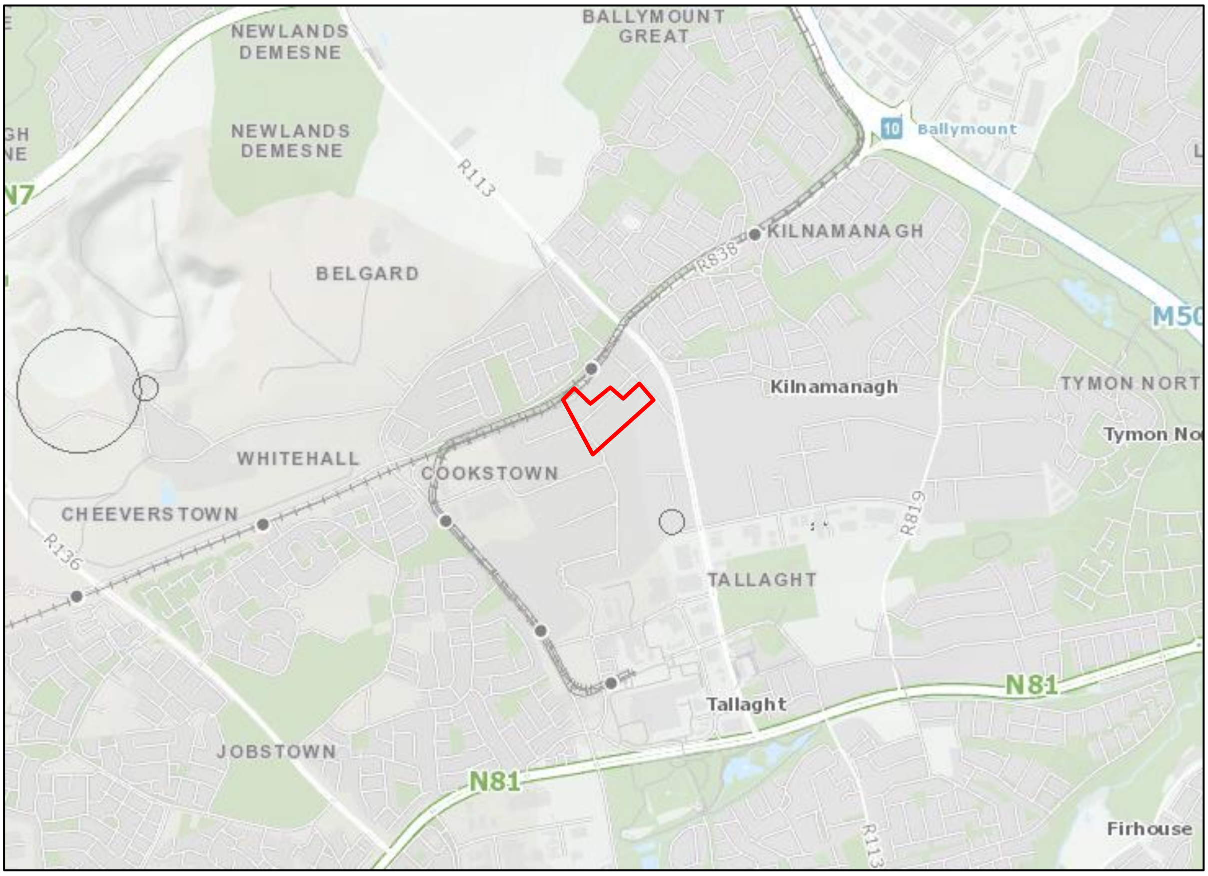


Figure 6.10 GSI Groundwater wells and springs Map – Site location is shown in red

6.4.14 Areas of Conservation (NHA & SACs)

The EPA and NPWS on-line databases indicate that there are no ecological designated areas within or immediately adjacent to the proposed development site. The nearest relevant feature is the Dodder Valley which is a proposed Natural Heritage Area (pNHA) and is located approx. 2.5km to the south-east of the proposed development.

6.4.15 Waste Licence Facilities

According to the EPA online maps, there are a number of license waste sites operating within the boundaries of the Cookstown industrial Estate, however, they are located outside the site boundaries. The nearest facility is located approx. 120m west of the site.

No landfills are in proximity to the area of the proposed site.

6.4.16 Site Specific Data and Site Investigations

An environmental ground investigation was carried out in May 2020 by RSK Ireland Limited at the site of the existing fuel station located adjacent to the eastern site boundary of the proposed development (a copy of the associated report is included at Appendix 6.1). The GI comprised 5 No. boreholes (MW 101-105) drilled to refusal at depths of 3.4-4.6m using a Dando Terrier tracked window sampling drilling rig. The boreholes were completed with groundwater and gas monitoring wells. There was no lab or field testing carried out. The GI location plan is shown on Figure 6.11. A summary of the ground conditions encountered in the site investigation points is given on Table 6.2.

Figure 6.11 RSK 2020 GI location plan

Soil layer	Top (mbgl)	Bottom (mbgl)	Description
Made Ground	0	0.3-1.0	Tarmacadam / Gravel fill / Brown very sandy gravelly Clay
Brown Boulder Clay	0.3-1.0	0.9-2.0	Brown slightly sandy gravelly Clay
	0.9-2.0	3.4-4.6	Stiff to hard brown slightly sandy gravelly Clay with cobbles and boulders

Table 6.2 Summary of the ground conditions encountered in the site investigation points

6.4.17 Soil Quality

An environmental ground investigation was carried out in May 2020 by RSK Ireland Limited. A contamination assessment of the site is addressed in their report titled Generic Quantitative Risk Assessment.

The soil quality assessment carried out by RSK confirmed no evidence of contamination.

6.5 Importance of Geological/Hydrogeological Features

The Institute of Geologists of Ireland (IGI) has given criteria for rating site importance of geological and hydrogeological which are summarised on Table 6.3 and Table 6.4, respectively.

There are no important geological features identified on this site.

The hydrogeological features identified on this site area as follows:

- The locally important (LI) aquifer beneath the site.

The importance of the aquifer is rated as having a ***'Medium Importance'*** based on the fact that the bedrock underlying the site is a Locally Important aquifer and has potential for local water supply in the vicinity.

Importance	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale Degree or extent of soil contamination is significant on a national or regional scale Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale	Geological feature rare on a regional or national scale (NHA) Large existing quarry or pit Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale Degree or extent of soil contamination is significant on a local scale Volume of peat and/or soft organic soil underlying route is significant on a local scale	Contaminated soil on site with previous heavy industrial usage Large recent landfill site for mixed wastes Geological feature of high value on a local scale (County Geological Site) Well drained and/or high fertility soils Moderately sized existing quarry or pit Marginally economic extractable mineral resource
Medium	Attribute has a medium quality, significance or value on a local scale Degree or extent of soil contamination is moderate on a local scale Volume of peat and/or soft organic soil underlying route is moderate on a local scale	Contaminated soil on site with previous light industrial usage Small recent landfill site for mixed wastes Moderately drained and/or moderate fertility soils Small existing quarry or pit Sub-economic extractable mineral resource
Low	Attribute has a low quality, significance or value on a local scale Degree or extent of soil contamination is minor on a local scale Volume of peat and/or soft organic soil underlying route is small on a local scale	Large historical and/or recent site for construction and demolition wastes Small historical and/or recent landfill site for construction and demolition wastes Poorly drained and/or low fertility soils Uneconomically extractable mineral resource

Table 6.3 Criteria for Rating Site Importance of Geological Features (NRA, 2008) - Extract from 'Guidelines for the Preparatin of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status
Very High	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple wellfields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – e.g. NHA status. Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source. Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer Potable water source supplying >50 homes. Outer source protection area for locally important water source.
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer. Potable water source supplying <50 homes.

Table 6.4 Criteria for Rating Site Importance of Hydrogeological Features (NRA, 2008) - Extract from 'Guidelines for the Preparatin of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'

6.6 Impact Significance Rating of Geological/Hydrogeological Features

The IGI have given criteria for rating the impact significance of geological and hydrogeological which are summarised on Table 6.5 and Table 6.6, respectively.

The hydrogeological feature has a ***Negligible to Small Adverse*** impact significance**.**

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status
Very High	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple wellfields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – e.g. NHA status. Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source. Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer Potable water source supplying >50 homes. Outer source protection area for locally important water source.
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer. Potable water source supplying <50 homes.

Table 6.5 Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Geology Attribute (NRA, 2008) - Extract from 'Guidelines for the Preparatin of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	Removal of large proportion of aquifer. Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. Potential high risk of pollution to groundwater from routine run-off[1]. Calculated risk of serious pollution incident >2% annually[2].
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Removal of moderate proportion of aquifer. Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems. Potential medium risk of pollution to groundwater from routine run-off[1]. Calculated risk of serious pollution incident >1% annually[2].
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Removal of small proportion of aquifer. Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. Potential low risk of pollution to groundwater from routine run-off[1]. Calculated risk of serious pollution incident >0.5% annually[2].
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Calculated risk of serious pollution incident <0.5% annually[2].

Table 6.6 Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Hydrogeology Attribute (NRA, 2008) - Extract from 'Guidelines for the Preparatin of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'

6.7 Significant Environmental Impacts

The IGI have given criteria for rating the Significance of the impact on the feature based on the Importance of the feature and the Magnitude of the impact using the matrix shown on Table 6.7.

Based on the classification of the hydrogeological features (i.e. the aquifer) as ***Medium Importance*** with a ***Negligible to Small Adverse*** impact significance, the significance on the Environment is considered to be ***Slight.***

Importance of Attribute	Magnitude of Impact			
	Negligible	**Small Adverse**	**Moderate Adverse**	**Large Adverse**
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/ Moderate	Profound/ Significant	Profound
High	Imperceptible	Moderate/ Slight	Significant/ Moderate	Profound/ Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/ Moderate

Table 6.7 Rating of Significant Environmental Impacts at EIS Stage (NRA, 2008) - Extract from 'Guidelines for the Preparatin of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'

6.8 Construction Phase Activities

Construction activities will include the following:

- Demolition of existing industrial and commercial buildings.
- Removal of topsoil, tarmac, concrete and overburden to facilitate the construction of the proposed development.
- Rock was not encountered up to a depth of 4.60mbgl in the Ground investigation provided. Nevertheless, some localised removal of bedrock might be required.
- Infilling and landscaping will be undertaken.
- Excavated soils/stones will be reused on site as fill and/or for landscaping purposes, where possible.
- Temporary storage/use of fuel/oils on site will be required for construction machinery.

A Construction Management Plan (CMP) is to be prepared for the proposed development. This CMP will ensure effective soil and water management during construction. The CMP will cover potentially polluting activities and include an emergency response procedure.

The specific measures included within the CMP which are relevant to this chapter are as follows:

6.8.1 Soil Removal, Compaction and Disposal

Construction works will require excavations of overburden and potentially bedrock with the addition of fill for site levelling and foundations. Temporary storage of soil will be carefully managed to prevent environmental impact, impact on soil structure and generation of dust. e.g. storing stockpiles away from any open surface water drains, managing height and slope of stockpile and minimising soil movement. Soil to be removed from site will be sampled by a suitably qualified person(s) and analysed for relevant waste acceptance criteria analysis (WAC) before removal by a licensed waste disposal contractor as required.

6.8.2 Fuel and Chemical Handling

Refuelling of construction vehicles, and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area (or where possible off site) which will be away from surface water gulleys or drains. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double-skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area and made available. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as '*Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors'* (CIRIA 532, 2001) and other CIRIA guidelines regarding good practice (CIRIA 692, 2011; CIRIA 715, 2012) will be complied with.

With respect to portable equipment containing fuel oil, drip trays or approved equipment shall be used. Adequate spill clean-up materials shall be available on site at all times.

All ready-mixed concrete shall be brought to site by truck. A suitable risk assessment for wet concreting shall be completed prior to works being carried out which will include measures to prevent discharge of alkaline waste waters or contaminated storm water to the underlying subsoil. The construction trucks shall be sent back to their depots for wash down as per CIRIA C648 recommendations.

6.8.3 Accidental Spills & Leaks

Emergency response procedures for any oil leaks shall be outlined in the CMP for the site. All relevant personnel working on the site will be trained in the implementation of the procedures.

6.9 Operational Phase Activities

During the operational phase, the water will be supplied from public mains and a surface water drainage design will be implemented which will discharge surface water to an approved discharge point. Foul effluent will be discharged to public foul sewer.

It is expected that, given that the site is already developed, there will be no significant changes on the overall hydrogeological regime of the area. Surface water will be discharged to the public surface water network.

6.10 Potential Impacts

The potential impacts during construction and operation are outlined in this section. The implementation of the mitigation measures outlined further in this Chapter and the design mitigation measures outlined in the CMP will ensure that the primary potential impact of accidental release to ground during the construction phase are minimised. These measures will ensure that the development does not impact on receiving land soil or groundwater quality.

6.10.1 Construction phase

Excavation & Infilling Impact on Aquifer Vulnerability

Excavation will be required to an average depth of approx. 0.75-1.00m below current ground level at the site. Rock was not the encountered to depths of 3.4-4.6mbgl during the ground investigation carried out adjacent to the eastern site boundary, therefore, considering the low permeability of the Boulder Clay overburden, the impact on the bedrock aquifer should be minimal.

Should rock be encountered within the depth of excavation, however, appropriate mitigation measures shall be implemented to minimise impact on the bedrock aquifer.

Land Use

There will be no loss of land use for this proposed development given that the site currently consists of warehouses with paved areas and parking spaces.

Accidental Spills & Leaks

During construction, there is an increased risk of accidental pollution incidences from the following sources:

- Spillage or leakage of temporary oils and fuels stored on site for construction.
- Spillage or leakage of oils and fuels from construction machinery or site vehicles.
- Alkaline run-off from concrete and cement construction.

Accidental spillages (including any release of chemicals) may result in contamination of soils and shallow groundwater underlying the site, if not adequately mitigated.

Emergency response procedures for any oil leaks shall be outlined in the CMP for the site. All relevant personnel working on the site will be trained in the implementation of the procedures.

Localised Dewatering

The excavation will be carried out in Brown Boulder Clay below the groundwater table which is indicated to be at a depth of approx. 2.0mbgl. The excavation depth will extend to approx. 0.75-1.00m bgl. Therefore, localised dewatering may be required to maintain the excavation dry.

The overburden comprises a brown Boulder Clay which would have low permeability, therefore, the dewatering required on the site should be minimal if the excavation is within the Boulder Clay deposit. There may be some local granular layers of higher permeability which would give rise to higher inflow, however, these are typically only localised deposits and would not be connected to a large granular stratum. Therefore, the effect of dewatering on the underlying aquifer should be minimal if the excavation is within the Boulder Clay deposit.

The impact on the underlying bedrock aquifer will depend on whether rock will be exposed/excavated during the works. If the excavation extends into underlying rock, the groundwater levels in the underlying bedrock would be affected. Therefore, if rock is encountered within the excavation depth, appropriate mitigation measures shall be implemented to minimise impact on the bedrock aquifer.

The Impacton the groundwater industrial abstraction well located 400m south of the site should be further investigated by means of analytical and/or numerical analyses to determine the impact on its productivity if dewatering within a high permeability stratum is required.

6.10.2 Operational phase

The potential impacts of the proposed development on the surrounding area during the operational phase are discussed below:

- There is no additional significant bulk fuel storage planned as part of the proposed development. Therefore, there is no potential contamination issue due to this facility.
- There will be no discharge of water to ground during the operation of the proposed development.
- There is no long-term dewatering required as part of the operational phase, therefore, there is no long-term drawdown or groundwater lowering issues expected for the site, and thus, no long-term issues related to the industrial well located 400m south of the site.
- There will be no direct discharges to groundwater or soil environment during the operational phase. As such, local contamination impact could only occur due to accidental emissions such as localised accidental leakages from cars/vehicles in the car park areas.

Therefore, the potential impact of the proposed development on the surrounding area during the operational phase is as follows:

- Accidental spills and leaks

6.11 Mitigation Measures

A number of mitigation measures have been considered for both the construction and operational phases of the proposed development and these are discussed in this section.

6.11.1 Construction Phase

In order to reduce impacts on the soils, geology and hydrogeology in the area, 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 and rock excavation and export from site;
- Sources of fill and aggregates for the proposed development;
- Fuel and chemical handling, transport and storage; and
- Control of water during construction.

Construction Management Plan

In advance of work starting on site the Contractor will prepare a Construction Management Plan (CMP). The CMP will set out the overarching vision of how the construction of the proposed development will be managed in a safe and organised manner by the Contractor as per client requirements. The CMP will be a live document and will set out requirements and standards which must be met during the construction stage. It will also include the relevant mitigation measures outlined in the EIAR and any subsequent conditions relevant to the proposed development.

Control of Soil Excavation

Subsoil and, potentially, bedrock will be excavated to facilitate the construction of the proposed development which will incorporate the reduce, reuse and recycle approach. The construction will be carefully planned to ensure only material required to be excavated will be, with as much material left in situ as possible. Excavation arisings will be reused on site where possible, however, it is envisioned that approx. 4,500 m3 will be exported from site.

It is unlikely any contaminated material will be encountered during construction of the proposed development. Nevertheless, any excavation works will be carefully monitored by a suitably qualified person to ensure any potentially contaminated soil is identified and segregated from clean/inert soil. In the unlikely event that any potentially contaminated soils are encountered, they should be tested and classified as hazardous or non-hazardous in accordance with the *EPA Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* publication, the HazWaste Online tool or a similar approved method. The material will then need to be classified as inert, non-hazardous, stable non-reactive hazardous or hazardous in accordance with EC Decision 2003/33/EC. It should then be removed from site by a suitably permitted waste contractor to an authorised waste facility.

Stockpiles have the potential to cause negative impacts on air and water quality by the production of dust (air quality) and silt sediments (water quality). The effects of soil stripping and stockpiling will be mitigated against through the implementation of an appropriate earthworks handling protocol during construction. Any stockpiles shall be formed within the boundary of the site and there shall be no direct link or pathway from this area to any surface water body and silt traps shall be installed, where appropriate.

Dust suppression measures (e.g. damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment are free of nuisance dust and dirt on roads.

Export of Material from Site

It is envisioned that some of the soil/rock arising on the site will be re-used on site. The remaining excavated material will be removed off-site either as a waste or, where appropriate, as a by-product. Where the material is to be reused on another site as a by-product (and not as a waste), this will be done in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011. EPA agreement will be obtained before re-using the spoil as a by-product. Where material cannot be reused off site it will be sent for recovery or disposal at an appropriately licensed facility.

If any waste soil requires removal from site, it should be classified by an experienced and qualified environmental professional to ensure that the waste soil is correctly classified for transportation and recovery/disposal offsite.

Sources of Fill and Aggregates

All fill and aggregate for the Proposed Development will be sourced from reputable suppliers. All suppliers will be vetted for:

- Aggregate compliance certificates/declarations of conformity for the classes of material specified for the Proposed Development.
- Environmental Management status; and
- Regulatory and Legal Compliance status of the Company.

It is anticipated that approximately 4,500 m3 engineered fill will be required to facilitate construction.

Fuel and Chemical Handling

The following mitigation measures will be taken at the construction stage to prevent any spillages to ground of fuels and prevent any resulting soil and/or groundwater quality impacts:

- Designation of a bunded refuelling areas on the site;
- Provision of spill kit facilities across the site;
- Where mobile fuel bowsers are used the following measures will be taken:
    - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
    - The pump or valve will be fitted with a lock and will be secured when not in use;
    - All bowsers to carry a spill kit
    - Operatives must have spill response training; and
    - Drip trays used on any required mobile fuel units.

In the case of drummed fuel or other potentially polluting substances which may be used during construction the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;
- 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 will be 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 CMP.

Control of Water during Construction

The Contractor shall ensure that a surface water drainage regime is implemented during the construction works. This can be carried out by constructing cut-off ditches and interceptor drains connected to a suitable and authorised discharge point.

All run-off shall be prevented from directly entering into any water course/ drainage ditches.

Should any discharge of construction water be required a licence will be acquired from the appropriate licencing authority. Pre-treatment and silt reduction measures on site will include a combination of silt fencing, settlement measures (silt traps, silt sacks and settlement tanks/ponds) 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 needed.

6.11.2 Operational Phase

There will be no bulk storage of fuel required for the operation of the proposed residential development. A considerable area of the site will be covered in hardstanding. The impermeable surface will minimise the potential influx of any contaminants from cars/trucks into soils and underlying groundwater.

Any accidental leaks from cars within the car parking/road areas will be directed through the surface drainage system via an appropriately sized interceptor.

The proposed surface water network for the proposed development has been designed as four separate catchments, one for each block. Each of the proposed catchments with be attenuated in separate infiltration detention facilities before discharge. The individual attenuation requirement for each of the proposed surface water catchments has been separately assessed. The discharge rates for these catchments will be controlled by a flow control device (hydro brake) and the appropriately sized attenuation facility.

Foul and surface water systems for the site will be separate and are designed in accordance with the requirements of South Dublin County Council, the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS), the Building Regulations and the recommendations of the DOE Recommendations for Site development works for Housing areas. In addition, surface water has been designed with reference to the ‘The Planning System and Flood Risk Management Guidelines', the Greater Dublin Regional Code of Practice for drainage works and Irish Water Standards Details for water and wastewater.

6.12 Residual Impacts

This section describes the predicted residual impact of the proposed development following the implementation of the remedial and mitigation measures.

6.12.1 Construction Phase

The implementation of mitigation measures highlighted in Section 6.11 will ensure that the potential impacts on the land, soils, geological & hydrogeological environment are minimised during the construction phase. Based on the criteria set out in the EPA Guidelines document, it is considered that the residual impact will be ***temporary*** in duration***, slight*** in significance of effect and **Negative** in quality**.**

6.12.2 Operational Phase

The implementation of mitigation measures highlighted in Section 6.11 will ensure that the potential impacts on the land, soils, geological & hydrogeological environment are minimised during the operational phase. Based on the criteria set out in the EPA Guidelines document, it is considered that the residual impact will be long term in duration, imperceptible in significance of the effect and Neutral in quality.

6.13 Monitoring

6.13.1 Construction Phase

Regular inspection of surface water run-off controls measures and cut-off/interceptor ditches shall be carried out throughout the construction phase. Regular inspection of construction mitigation measures will be undertaken e.g. concrete pouring, refuelling etc. as part of implementation of the site CMP.

6.13.2 Operational Phase

No future soil or groundwater monitoring is proposed as part of the proposed development. Petrol interceptor(s) shall be maintained and cleaned out in accordance with the manufacturer's instructions. Maintenance of the surface water drainage system and foul sewers as per normal urban developments is recommended to minimise any accidental discharges to ground.

6.14 Interactions and Potential Cumulative Impacts

6.14.1 Interactions

Soil, geology and hydrogeology

There is a close interaction between the soil, geology and hydrogeology. This is discussed and addressed in the previous sections of this report.

Air Quality

There is a potential for the soil to contaminate the air by producing dust during the works. This is discussed and addressed in the previous sections of this report.

6.15.2 Cumulative Impacts

Any potential impacts on the soil environment will be within the confines of the site boundary. With the implementation of the measures highlighted above and, in the CMP, the cumulative effect on the land, soils, geology and hydrogeology of the local environment is deemed to be insignificant.

7.0 WATER AND HYDROLOGY

7.1 Introduction

This chapter of the EIAR comprises of an assessment of the likely impact of the proposed development on the surrounding water & hydrological environment. The impact on land, soils and geology is addressed in Chapter 6.0. Chapter 10.0 (Material Assets) addresses the impacts on water supply, wastewater and storm water drainage.

The proposed development is a mixed use residential scheme on a site with overall area of 4.99 hectares approximately at Cookstown Industrial Estate, Dublin 24. The site is situated approximately 750m northeast of Tallaght Hospital and 1.1km north of the Whitestown Stream.

The author of this Chapter is Greg Daly (FConsEI BScEng CEng MIEI MIStructE MCIArb MBA) of GDCL Consulting Engineers - a Chartered Professional Engineer with over 35 years' experience in the design and construction of civil engineering projects, including developments associated with residential, commercial, industrial and public infrastructure sectors.

7.2 Research Methodology

Assessment of the likely impact of the proposed development on the surrounding surface water and hydrogeological environments included the following activities:

- Greater Dublin Strategic Drainage Study (GDSDS).
- Method outlined in Irish Water's Code of Practice for Wastewater Infrastructure.
- Site inspection
- Review of existing topographic survey information
- Ground investigations including soakaway testing
- Review of information available on the Environmental Protection Agency (EPA) online mapping service
- Review of information available on the Geological Survey of Ireland (GSI) online mapping service
- Review of Office of Public Works (OPW) National Flood Hazard Mapping and CFRAM Studies (Catchment Flood Risk Assessment and Management Studies)
- South Dublin County Council Development Plan 2016 - 2022
- Review of Strategic Flood Risk Assessment for South Dublin County Council Development Plan 2016-2022

As part of assessing the likely impact of the proposed development, surface water runoff, calculations were carried out in accordance with the following guidelines:

- Greater Dublin Strategic Drainage Study (GDSDS).

7.2.1 Receiving Environment

7.2.1.1 Hydrology

The Whitestown River is the main hydrological feature in the area (Dodder_SC_010 Sub Catchment) and is located approximately 1.1km to the south of the site (refer to Figure 7.1 overleaf, extract from EPA Online Mapping Service).

The nearest EPA designated watercourse is a tributary of the River Dodder, referred to as "Jobstown Stream" by the EPA, which is shown running along the southern edge of the site. This tributary drains to the River Dodder, and can be seen on Figure 7.1.

A topographical survey provided indicates that the site has a moderate fall from west to east, sloping towards the stream to the south of the site. Therefore, it can be assumed that the site is part of a single surface water catchment currently drains to the "Jobstown Stream" tributary, ultimately discharging to the River Dodder.

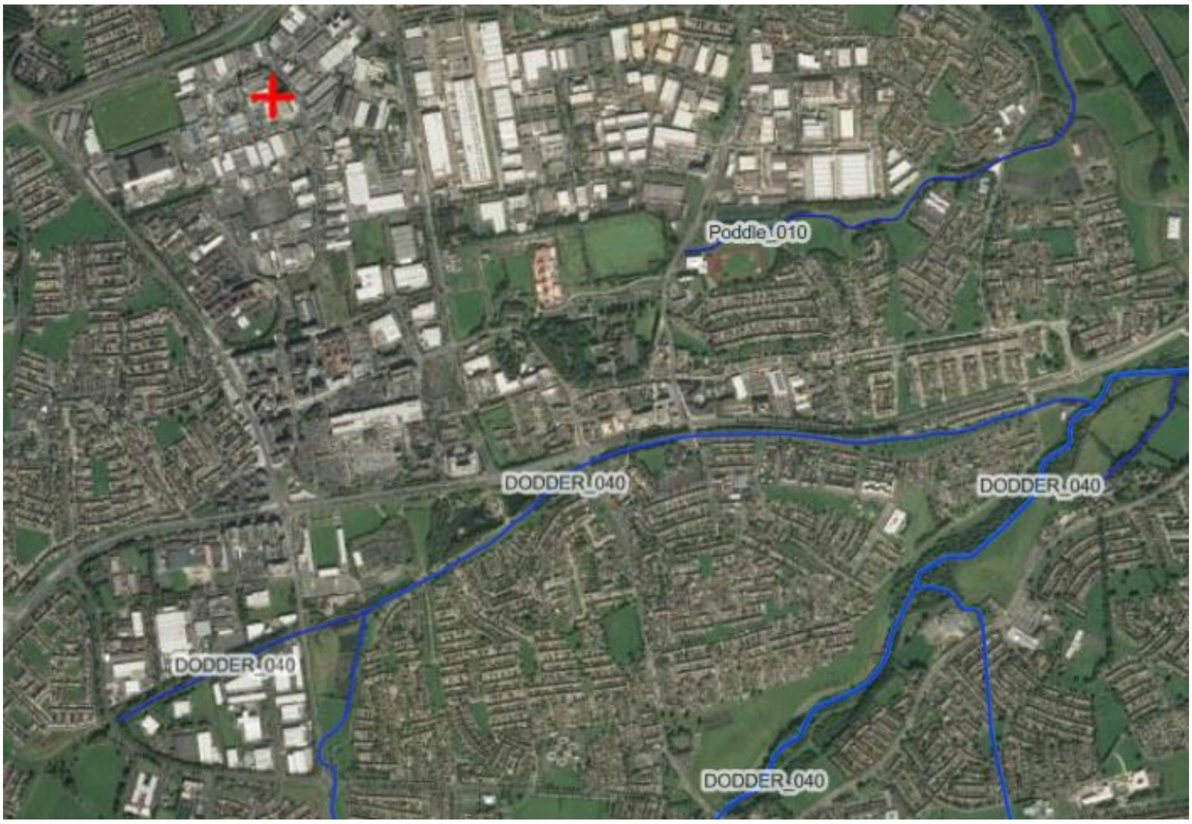


Figure 7.1 EPA Online Mapping Service - Designated Watercourses and Tributaries

7.2.1.2 Flood Risk

A flood hazard assessment has been undertaken by reviewing information from the Office of Public Works (OPW) National Flood Hazard Mapping (www.floods.ie), the South Dublin County Council Development Plan 2016 – 2022 and the Eastern CFRAM Study. This assessment has been carried out in accordance with the procedure outlined in the OPW's Guidelines for Planning Authorities – The Planning System and Flood Risk Management (November 2009), "Stage 1 Flood Risk Identification".

- OPW Flood Hazard Mapping

    i. The OPW's Summary Local Area Report provides records all flood events within a 2.5 km radius of the site. There were noprevious flood events identified within a 2.5km radius of the site.

- Eastern CFRAM Study

    i. As part of the EU Floods Directive, the OPW initiated the National CFRAM Programme to implement some of the key recommendations of the Report of the Flood Policy Review Group. In particular, it was developed to prepare flood maps and flood risk management plans, focusing on areas where the risk is understood to be most significant. These areas of focus (the AFAs) are being identified through the Preliminary Flood Risk Assessment (PFRA) undertaking a Catchment Flood Risk Assessment and Management (CFRAM) Study.

    ii. The PFRA maps for the Cookstown area identifies the main rivers for the area and shows that there is no risk of fluvial flooding within the subject site.

- South Dublin County Council Development Plan 2016-2022

    i. The South Dublin County Council Development Plan 2016-2022 came into effect in May 2016.

ii. As part of the EU Floods Directive, the OPW initiated the National CFRAM Programme to implement some of the key recommendations of the Report of the Flood Policy Review Group. In particular, it was developed to prepare flood maps and flood risk management plans, focusing on areas where the risk is understood to be most significant. These areas of focus (the AFAs) are being identified through the Preliminary Flood Risk Assessment (PFRA) undertaking a Catchment Flood Risk Assessment and Management (CFRAM) Study.

iii. The PFRA maps for the Cookstown area identifies the main rivers for the area and shows that there is no risk of fluvial flooding within the subject site.

- Strategic Flood Risk Assessment for South Dublin County Council Development Plan 2016-2022
-

i. The Strategic Flood Risk Assessment for South Dublin County Council Development Plan 2016-2022 came into effect in January 2016.

ii. The Strategic Flood Risk Assessment for South Dublin County Council Development Plan 2016-2022 identified areas of applicability of the Justification Test and flood risk management proposals for proposed zonings in Cooktown. The zonings were compared against the draft Final CFRAM flood mapping. A review of historical flooding, significant watercourses and historical mapping did not indicate any further fluvial flood risk outside the scope of the CFRAM mapping. The Cooktown Lands, containing the subject site were identified as not being applicable for the Justification Test requirement as the lands lie within Flood Zone C.

7.3 Characteristics of the Proposed Development

7.3.1 Hydrology

No adverse effects on surrounding hydrology is anticipated as the site is located relatively remote from the Whitetown Stream, is not located in an area subject to fluvial flooding and attenuation of surface water flows to greenfield runoff rates is being provided.

In accordance with the GDSDS surface water runoff from the proposed development will be attenuated using vortex control devices (Hydrobrake or equivalent) at each outfall, limiting discharge to greenfield runoff rates.

In order to adhere to this requirement, the calculated allowable surface water runoff for the entire development has been calculated as 8.4 l/s. It has been determined that a total attenuation volume of 2284 m³ will therefore be required on site to accommodate for the 100-year storm event (provision for climate change included), as required by the GDSDS.

7.3.2 Flood Risk

Based on a review of Eastern CFRAM Study, the OPW's Flood Hazard Mapping, the Strategic Flood Risk Assessment for South Dublin County Council Development Plan 2016-2022 and the South Dublin County Council Development Plan 2016-2022 the site is deemed to be at a low probability of flooding.

7.4 Potential Impact of the Proposed Development

7.4.1 Construction Phase

Potential impacts that may arise during the construction phase are noted below:

- Surface water runoff during the construction phase may contain increased silt levels (e.g. runoff across areas stripped of topsoil) or become polluted by construction activities.
- Discharge of rain water pumped from excavations.
- Accidental spills and leaks associated with storage of oils and fuels, leaks from construction machinery and spillage during refueling and maintenance contaminating the surrounding surface water and hydrogeological environments.

- Review of existing topographic survey information.
- Concrete runoff, particularly discharge of wash water from concrete trucks.
- Discharge of vehicle wheel wash water.
- Infiltration of groundwater into excavations.

7.4.2 Operational Phase

Potential operational phase impacts are noted below:

- Increased impermeable surface area will reduce local groundwater recharge and potentially increase surface water runoff (if not attenuated to greenfield runoff rate).
- Accidental hydrocarbon leaks and subsequent discharge into piped surface water drainage network (e.g. along roads and in driveway areas).

7.4.3 Do Nothing Scenario

There are no predicted impacts should the proposed development not proceed.

7.5 Remedial and Reductive Measures

7.5.1 Construction Phase

- Surface water runoff during the construction phase may contain increased silt levels (e.g. runoff across areas stripped of topsoil) or become polluted by construction activities.
- A site specific Construction and Environment Management Plan will be developed and implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the Construction and Environment Management Plan.
- Rain water pumped from excavations is to be directed to on-site settlement ponds.
- Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
- Weather conditions and seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.
- In order to mitigate against spillages contaminating the surrounding surface water and hydrogeological environments, all oils, fuels, paints and other chemicals shall be stored in a secure bunded hardstand area. Refueling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (where not possible to carry out such activities off site).
- Concrete batching will take place off site and wash down and wash out of concrete trucks will take place off site.
- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
- Groundwater pumped from excavations is to be directed to on-site settlement ponds.

7.5.2 Operational Phase

The design of proposed site levels (roads, FFL etc.) has been carried out in such a way as to replicate existing surface contours, break lines etc., therefore replicating existing overland flow paths, and not concentrating additional surface water flow in a particular location.

Surface water runoff from the site will be attenuated to the greenfield runoff rate as outlined in the Greater Dublin Strategic Drainage Study (GDSDS). Surface water discharge rates will be controlled by a Hydrobrake type vortex control device in conjunction with attenuation storage.

The following methodologies are being implemented as part of a SuDS surface water treatment train approach:

- Extensive green roofs where applicable.
- Attenuation of the 30 and 100-year return period storms.

- Installation of a Hydrobrake (limiting surface water discharge from the site to greenfield runoff rates).
- Surface water discharge will also pass via a Class 1 fuel / oil separator (sized in accordance with permitted discharge from the site).

7.5.3 'Do Nothing' Scenario

No mitigation measures are proposed in relation to water and the hydrological environment if the development does not proceed.

7.6 Predicted Impact of the Proposed Development

7.6.1 Construction Phase

Implementation of the measures outlined in Section 7.5.1 will ensure that the potential impacts of the proposed development on water and the hydrological environment do not occur during the construction phase and that any residual impacts will be short term.

7.6.2 Operational Phase

As surface water drainage design has been carried out in accordance with the GDSDS, and SuDS methodologies are being implemented as part of a treatment train approach, there are no predicted impacts on the water and hydrogeological environment arising from the operational phase.

7.6.3 'Do Nothing' Scenario

There are no predicted impacts should the proposed development not proceed.

7.7 Monitoring

Proposed monitoring during the construction phase in relation to the water and hydrological environment are as follows:

- Adherence to Outline Construction Management Plan.
- Inspection of fuel / oil storage areas.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and vehicle wheel wash facilities.
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.)
- Monitoring of discharge from sediment retention ponds (e.g. pH, sediment content)

During the operational phase an inspection and maintenance contract is to be implemented in relation to the proposed Class 1 fuel / oil separators.

7.8 Reinstatement

Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from site and disposed of at an appropriate licenced facility. South Dublin County Council's Environmental Control Section is to be notified of the proposed destination for disposal of any liquid fuels.

All sediment control measures (e.g. sediment retention ponds) are to be decommissioned on completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer's drawings.

8.0 NOISE AND VIBRATION

8.1 Introduction

This chapter assesses the potential significant noise & vibration impacts associated with the proposed mixed use residential development at Cookstown Industrial Estate, Tallaght, Dublin 24.

This section of the EIAR has been prepared by AWN in the context of current relevant standards and guidance. This assessment has been prepared by Donal Heavey BEng PgDip, Acoustic Technician at AWN Consulting who has over 2 years' experience as an environmental technician specialising in Acoustic Measurement and Impact Assessment and Dr Stephen Smyth Associate at AWN Consulting who has over 13 years' experience preparing Noise Impact Assessments.

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 impacts associated with the proposed development during both the short-term construction phase and the long-term operational phase on its surrounding environment and on the development itself. 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.

The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out within the relevant sections of this chapter and included in the references section. In addition to specific noise guidance documents, the following guidelines were considered and consulted for the purposes of this chapter:

- EPA Guidelines on the Information to be contained in Environmental Impact Statements, (EPA, 2002);
- EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), (EPA, 2003);
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (Draft August 2017), and;
- EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, September 2015).

8.2 Methodology

The study has been undertaken using the following methodology:

- Detailed baseline noise monitoring has been undertaken across the development site to determine the range of noise levels at varying locations across the site;
- A review of the most applicable standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development;
- 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 operational phase of the development at the most sensitive locations surrounding the development site;
- An inward noise impact assessment has been completed to determine the potential noise impact from environmental noise on the residential amenity of the development, and;
- A schedule of mitigation measures has been proposed to reduce, where necessary, the identified potential inward and outward impacts relating to noise and vibration from the proposed development.

8.3 Receiving Environment

The site is located in the Cookstown Industrial Estate, in the Tallaght area. The site is predominantly surrounded by industry and is bounded by Bóthar Katharine Tynan to the north and Old Belgard Road to the east. There are a number of residential housing estates to the north.

8.3.1 Environmental Noise Survey

An environmental noise survey has been conducted at the site in order to quantify the existing noise environment. The survey was conducted in general accordance with ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise. Specific details are set out below.

Choice of Measurement Positions

Five measurement locations were selected as shown in Figure 8.1.

Figure 8.1 Noise Survey Locations

Survey Periods

The attended noise surveys were conducted between the following periods:

- 12:14hrs to 15:27hrs on 14 May 2019 and,
- 15:28hrs to 15:59hrs on 16 May 2019

The unattended noise survey was conducted between the following periods:

- 10:58hrs on 14 May 2019 to 13:58hrs on 16 May 2019.

The measurements cover a period that was selected in order to provide a typical snapshot of the existing noise climate, with the primary purpose being to ensure that the proposed noise criteria associated with the development are commensurate with the prevailing environment. The weather during the survey periods was mostly dry and sunny with winds less than 5m/s and temperatures of some 1 - 19ºc.

Personnel and Instrumentation

Donal Heavey (AWN) and Donogh Casey (AWN) performed the measurements during the survey periods. Attended and unattended measurements were made using Rion NL-52 Sound Level Meters. Spot check measurements were made using a Larson Davis 831 Sound Level Meter. Sample periods were 15-minutes for all measurements.

Before and after the survey the measurement instruments were check calibrated using a Brüel & Kjær Type 4231 Sound Level Calibrator.

Measurement Parameters

The unattended 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_{A10} is the sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.

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.

L_{AFmax} is the instantaneous maximum sound level measured during the sample period using the 'F' time weighting.

L_{day} is the average L_{Aeq} noise level measured over the course of the daytime period, defined as 07:00hrs to 19:00hrs

$L_{evening}$ is the average L_{Aeq} noise level measured over the course of the daytime period, defined as 19:00hrs to 23:00hrs

L_{night} is the average L_{Aeq} noise level measured over the course of the daytime period, defined as 23:00hrs to 07:00hrs

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 2x10-5 Pa.

Survey Results and Discussion

The results of the surveys at the monitoring locations are summarised in Tables 8.1 and 8.2.

Location	Date & Start time	L_{Aeq}	L_{AFmin}	L_{AFmax}	$L_{AF10.0}$	$L_{AF90.0}$
ATT1	14/05/2019 12:14	66	78	47	71	50
	14/05/2019 13:24	66	80	45	71	48
	14/05/2019 14:44	66	78	46	71	49
ATT2	14/05/2019 12:38	62	78	48	64	53

Location	Date & Start time	L_{Aeq}	L_{AFmin}	L_{AFmax}	$L_{AF10.0}$	$L_{AF90.0}$
	14/05/2019 13:46	61	82	49	65	54
	14/05/2019 14:51	61	74	49	65	53
ATT3	14/05/2019 13:02	55	78	47	54	48
	14/05/2019 14:08	58	82	47	56	49
	14/05/2019 15:12	60	78	48	58	50
Spot Checks	14/05/2019 15:28	66	86	49	68	53
	14/05/2019 15:44	63	76	49	67	52

Table 8.1 Attended Survey Results

Location	Date	L_{day}	$L_{evening}$	L_{night}
Unattended	14/05/2019	63	47	51
	15/05/2019	63	48	50
	16/05/2019	64	n/a	n/a

Table 8.2 Unattended Survey Results

Road traffic, LUAS traffic and Industrial/Commercial activity noise were the dominant sources of noise at all locations.

8.4 Characteristics of the Proposed Development

When considering a development of this nature, the potential noise and vibration impacts on the surroundings must be considered for each of two distinct stages, the short-term construction phase and the permanent operational phase.

During the construction phase the main site activities will include, site clearance, demolition of existing buildings, building construction, road works, and landscaping. This phase has the greatest potential for noise and vibration impacts on the surrounding environment, however this phase will be of short-term impact.

During the operational phase of the development, no significant sources of outward noise or vibration are expected with the development. The primary source of outward noise in the operational context relates to any changes in traffic flows along the local road network and any operational plant noise. There is the potential for an inward noise impact on the development from road traffic noise generated by traffic on Bóthar Katharine Tynan and Belgard Road.

8.5 Potential Impact of the Proposed Development

8.5.1 Noise Criteria

Construction Phase

There is no published statutory Irish guidance relating to the maximum permissible noise and vibration levels that may be generated during the construction phase of a project. It is common practice to use BS 5228:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites with respect to the controlling noise and vibration impacts. In this instance, appropriate criteria relating to permissible construction noise levels are taken from Part One of the standard Noise.

The approach adopted here calls for the designation of a noise sensitive location into a specific category (A, B or C) based on exiting 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.

The closest neighbouring noise sensitive properties to the proposed development are the residential dwellings to the north/northwest of the site, which are located approximately 115m from the development buildings at their closest point.

BS 5228-1:2009+A1:2014 sets out guidance on permissible noise levels relative to the existing noise environment. Table 8.3 sets out the values which, when exceeded, signify a significant effect at the facades of residential receptors.

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A [A]	**Category B [B]**	**Category C [C]**
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
Evenings and weekends [D]	55	60	65
Night-time (23:00 to 07:00hrs)	45	50	55

Table 8.3 Example Threshold of Significant Effect at Dwellings

Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.

Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.

Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.

For the appropriate assessment period (i.e. daytime in this instance) the ambient noise level is determined and rounded to the nearest 5dB. Baseline monitoring carried out as part of this assessment would indicate that Category B values are appropriate in terms of the nearest noise sensitive locations being considered in this instance.

If the construction noise exceeds the appropriate category value, then a significant effect is deemed to occur. Taking account of the measured ambient noise levels, the recommended daytime noise level for construction noise is 70dB L_{Aeq}.

Operational Phase

Additional Road Traffic on Public Roads

In order to consider the potential noise impact associated with the proposed development introducing additional traffic onto the existing road networks, and given that vehicle movements on public roads are assessed using a different parameter (the ten percentile noise level; L_{A10}), it is appropriate to consider the increase in traffic noise level that arises as a result of vehicular movements associated with the development in terms of the L_{A10} parameter.

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 8.4 offers guidance as to the likely impact associated with any particular change in traffic noise level (Source DMRB, 2011).

Change in Sound Level (dB L_{A10})	Subjective Reaction	DMRB magnitude of Impact	EPA Classification Magnitude of Impact
0	Inaudible	No Change	Neutral
0.1 – 2.9	Barely Perceptible	Negligible	Imperceptible
3 – 4.9	Perceptible	Minor	Slight
5 – 9.9	Up to a doubling of loudness	Moderate	Moderate
10+	Doubling of loudness and above	Major	Significant

Table 8.4 Likely Impact Associated with Change in Traffic Noise Level

Inward Noise Impact

The Professional Guidance on Planning & Noise (ProPG) document was published in May 2017. The document was prepared by a working group comprising members of the Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH). Although not a government document, since it's adoption it has been generally considered as a best practice guidance and has been widely adopted in the absence of equivalent Irish guidance.

The ProPG outlines a systematic risk based 2 stage approach for evaluating noise exposure on prospective sites for residential development. The two primary stages of the approach can be summarised as follows:

- Stage 1 - Comprises a high-level initial noise risk assessment of the proposed site considering either measured and or predicted noise levels; and,
- Stage 2 – Involves a full detailed appraisal of the proposed development covering four "key elements" that include:
    - Element 1 - Good Acoustic Design Process;
    - Element 2 - Noise Level Guidelines;
    - Element 3 - External Amenity Area Noise Assessment
    - Element 4 - Other Relevant Issues

The initial noise risk assessment is intended to provide an early indication of any acoustic issues that may be encountered. It calls for the categorisation of the site as a negligible, low, medium or high risk based on the pre-existing noise environment. Figure 8.2 presents the basis of the initial noise risk assessment, it provides appropriate risk categories for a range of continuous noise levels either measured and/or predicted on site.

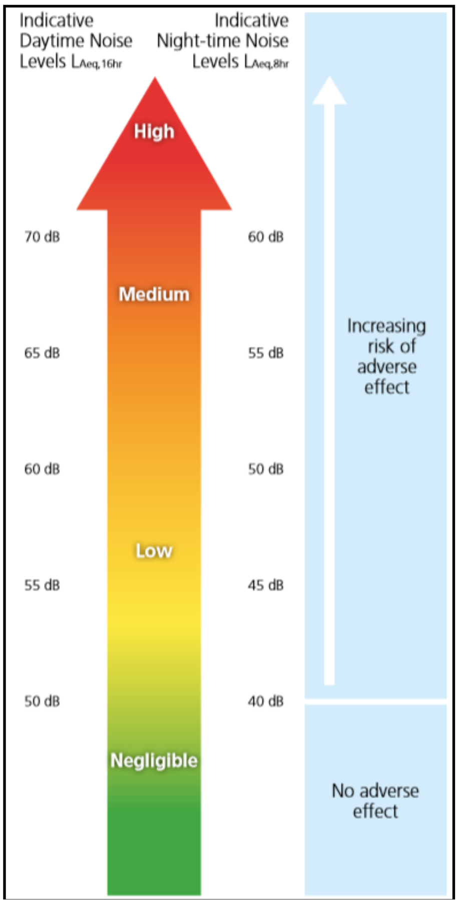


Figure 8.2 ProPG Stage 1 - Initial Noise Risk Assessment

It should be noted that a site should not be considered a negligible risk if more than 10 L_{AFmax} events exceed 60 dB during the night period and the site should be considered a high risk if the L_{AFmax} events exceed 80 dB more than 20 times a night.

Element 2 of the ProPG document sets out recommended internal noise targets derived from BS 8233 (2014). The recommended indoor ambient noise levels are set out in Table 8.5 and are based on annual average data, that is to say they omit occasional events where higher intermittent noisy events may occur.

Activity	Location	(07:00 to 23:00hrs)	(23:00 to 07:00hrs)
Resting	Living room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$ 45 dB $L_{Amax,T}$*

Table 8.5 ProPG Internal Noise Levels

*Note The document comments that the internal $L_{AFmax,T}$ noise level may be exceeded no more than 10 times per night without a significant impact occurring.

In addition to these absolute internal noise levels ProPG provides guidance on flexibility of these internal noise level targets. For instance, in cases where the development is considered necessary or desirable, and noise levels exceed the external noise guidelines, then a relaxation of the internal L_{Aeq} values by up to 5 dB can still provide reasonable internal conditions.

ProPG provides the following advice with regards to external noise levels for amenity areas in the development:

> *"The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$."*

Creche and Residential Amenity Space Inward Noise Impact

The British Standard BS 8233: 2014: Guidance on Sound Insulation and Noise Reduction for Buildings also sets out recommended internal noise levels for several different non-domestic building types from external noise sources such as road and air traffic. The guidance is primarily for use by designers, hence BS8233 may be used as the basis for the development of an appropriate schedule of noise control measures.

The recommended indoor ambient noise levels in non-domestic buildings are as follows:

Objective	Typical Situations	Design range dB $L_{Aeq,T}$
Typical noise levels for acoustic privacy in shared spaces	Restaurant	40 – 55
	Open plan office	45 – 50
	Night club, public house	40 – 45
	Ballroom, banqueting hall	35 – 40
	Living room	35 – 40

Table 8.6 Indoor ambient noise levels in spaces when they are unoccupied, and privacy is important

Objective	Typical Situations	Design range dB $L_{Aeq,T}$
Speech or telephone communications	Department Store Cafeteria, canteen, kitchen	50 – 55
	Concourse Corridor, circulation space	45 – 55
Study and work requiring concentration	Library, gallery, museum	40 – 50
	Staff/meeting room, training room	35 – 45
	Executive office	35 – 40
Listening	Place of worship, counselling, meditation, relaxation	30 – 35

Table 8.7 Typical Noise Levels in Non-Domesticated Buildings from BS8233

Based on a review of the BS 8233 standard and considering the proposed usage of the proposed development a criterion for internal noise levels for the crèche and community uses has been identified for each of the following rooms:

Room	Activity	Design Criterion dB $L_{Aeq,T}$
Quiet Room	Daytime Resting & Sleeping	35
Preschool Room	Study and Work requiring concentration	40
Office/Amenity Space		40

Table 8.8 Recommended design criteria for Rooms

Outward Noise Impact

For the purposes of this study, it is appropriate to derive external limits based on the internal criteria noted in the previous paragraphs. This is done by factoring in the degree of noise reduction afforded by a partially open window and typical 15dB attenuation is noted in this British Standard. Using this correction value across an open window, the following external noise levels would achieve the internal noise levels noted in Table 8.5 above.

1. Daytime / Evening (07:00 to 23:00 hours) 50 - 55dB $L_{Aeq,1hr}$
2. Night-time (23:00 to 07:00 hours) 45dB $L_{Aeq,15min}$

These noise limits will be applied to any sources of noise from the proposed development other than road traffic, for example mechanical plant serving the development.

8.5.2 Vibration Criteria

Construction Phase

In terms of 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 8.6 are recommended.

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

Table 8.6 Recommended Vibration Criteria During Construction Phase

Operational Phase

There are no expected sources of vibration associated with the operational phase, therefore, vibration criteria have not been specified for this phase.

8.6 Impact Assessments

8.6.1 Construction Phase

It is predicted that the construction programme will create typical construction activity related noise on site. During the construction phase of the proposed development, a variety of items of plant will be in use, such as excavators, lifting equipment, dumper trucks, compressors and generators.

The proposed general construction hours are 07:00 to 18:00hrs, Monday to Friday and 08:00 to 14:00 on Saturdays.

Due to the nature of daytime activities undertaken on a construction site of this nature, there is potential for generation of significant levels of noise. The potential for vibration at neighbouring sensitive locations during construction is typically limited to excavation works and lorry movements on uneven road surfaces. Due to the nature of the construction works on site there is little likelihood of structural or even cosmetic damage to existing neighbouring dwellings as a result of vibration.

Due to the fact that the construction programme has been established in outline form only, it is difficult to calculate the actual magnitude of noise emissions to the local environment. However, it is possible to predict typical noise levels using guidance set out in BS5228-1:2009+A1:2014. Table 8.7 outlines typical plant items and associated noise levels that are anticipated for various phases of the construction programme at a standard reference distance of 10 metres from the various plant items.

Phase	Item of Plant (BS 5228-1:2009+A1:2014 Ref.)	Construction Noise Level at 10m Distance (dB $L_{Aeq(1hour)}$)
Site Preparation	Wheeled Loader Lorry (D3 1)	75
	Track Excavator (C2 22)	72
	Dozer (C2.13)	78
	Dump Truck (C4.2)	78
Demolition	Pulveriser on Tracked Excavator (C1.5)	72
	Tracked Crusher (C1.14)	82
	Breaker Mounted on Backhoe (C1.2)	92
	Dump Truck (C4.2)	78
Foundations	Tracked Excavator (C3.24)	74
	Concrete Pump (C3.25)	78
	Compressor (D7 6)	77
	Poker Vibrator (C4 33)	78
General Construction	Hand tools	81
	Tower Crane (C4.48)	76
	Pneumatic Circular Saw (D7.79)	75
	Internal fit – out	70
Landscaping	Dozer (C2.13)	78
	Dump Truck (C4.2)	78
	Surfacing (D8.25)	68

Table 8.7 Typical Noise Levels Associated with Construction Plant Items

For the purposes of the assessment we have assumed that standard good practice measures for the control of noise from construction sites will be implemented. These issues are commented upon in further detail in the mitigation section of this chapter.

Table 8.8 presents the predicted daytime noise levels from an indicative construction period on site at the nearest off-site receptor. Note construction noise sources for site are assumed to be running 50% of the time. The predictions have been prepared for a distance of 115m from the site works which is representative of the worst-case situation when construction work is ongoing on the site boundaries closest to existing residential dwellings.

Construction Phase	Item of Plant (*BS 5228-1:2009+A1:2014* Ref)	BS5228 Reference Noise Level dB L_{Aeq} at 10m	Predicted at Receiver (115m distance) dB L_{Aeq}
Site Clearance/ Groundworks	Tracked excavator (C2.21)	71	47
	Dump Truck (C2.30)	79	55
	Telescopic Handler (C4.54)	79	55
	Tracked Mobile Crane (C4.50)	71	47
	Diesel Generator (C4.76)	61	37
	Total Site Clearance		58
General Construction	Dump Truck (D2.30)	79	55
	Tracked excavator (D2.21)	71	47
	Compressor (D7.08)	70	46
	Telescopic Handler (D4.54)	79	55

Construction Phase	Item of Plant (*BS 5228-1:2009+A1:2014* Ref)	BS5228 Reference Noise Level dB L_{Aeq} at 10m	Predicted at Receiver (115m distance) dB L_{Aeq}
	Hand Held Circular Saw (D4.72)	79	55
	Diesel Generator (D4.76)	61	37
	Internal Fit out	70	46
	Total General Construction		60
Road Works/ Landscaping	Asphalt Paver & Tipping Lorry (D5.30)	75	51
	Electric Water Pump (D5.40)	68	44
	Vibratory Roller (D5.20)	75	51
	Total Landscaping and Road Works		54

Table 8.8 Typical Noise Levels Associated with Construction Plant Items

It is not expected that construction noise levels will be such that a significant impact would occur at any of the nearest noise sensitive locations.

Note that the predicted noise levels referred to in this section are indicative only and are intended to demonstrate that it will be possible for the contractor to comply with current best practice guidance. It should also be noted that the predicted noise levels are expected to occur for only short periods of time at a limited number of properties. Construction noise levels will be lower than these levels for the majority of the time at the majority of properties in the vicinity of the proposed development.

Potential for vibration impacts during the construction phase programme are likely to be limited given the minimal level of ground breaking and excavations required. Piling is not anticipated as part of the works. 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 8.6 to avoid any cosmetic damage to buildings. Vibration levels are also expected to be below a level that would cause disturbance to building occupants.

8.6.2 Operational Phase

Additional Road Traffic on Public Roads

A traffic impact assessment relating to the proposed development has been prepared by NRB as part of this EIAR. Information from this report has been used to determine the predicted change in noise levels in the vicinity of a number of roads in the area surrounding the proposed development, for the opening and design years.

For the purposes of assessing potential noise impact, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing roads and junctions with and without the development. Traffic flow data in terms of the AADT figures has been assessed and the calculated change in noise levels during these two periods are summarised in Tables 8.9 and 8.10.

Road	Opening Year AADT		Change in Noise Level dB (A)
	Without Development	With Development	
Bothar Katharine Tynan - North of Site	8328	8555	+0.12
Old Belgard Rd - East of Site	8369	8880	+0.26
Belgard Rd - East of Site	20,358	20,560	+.04
Cookstown Rd - North of site	6,905	8,315	+0.81

Table 8.9 Change in Traffic Noise Levels with Proposed Development – Opening Year

Road	Design Year AADT		Change in Noise Level dB (A)
	Without Development	With Development	
Bothar Katharine Tynan - North of Site	8969	9195	+0.11
Old Belgard Rd - East of Site	9013	10085	+0.49
Belgard Rd - East of Site	21,926	22,130	+0.04
Cookstown Rd - North of site	7,430	8,845	+0.76

Table 8.10 Change in Traffic Noise Levels with Proposed Development – Design Year

The predicted increase in traffic noise levels associated with the development is less than 1dB for both the opening and design years. Reference to Table 8.4 confirms that this increase is barely perceptible and the resultant impact is imperceptible.

In summary, the predicted increase in noise levels associated with vehicles at road junctions in the vicinity of the proposed development is of long-term imperceptible impact.

Mechanical and Electrical Sources

Once a development of this nature becomes fully operational, a variety of electrical and mechanical plant will be required to service the commercial buildings associated with the development. Most of this plant will be capable of generating noise to some degree. Some of this plant may operate 24 hours a day, and hence would be most noticeable during quiet periods (i.e. overnight). Noisy plant with a direct line-of-sight to noise sensitive properties would potentially have the greatest impact.

To ensure noise impacts on the nearest sensitive locations, on and off site, are controlled to be within the criteria discussed in Section 8.7, cumulative noise from building services plant will be controlled such that it does not exceed a level of 70dB(A) at a distance of 1m from the façade of any building associated with the development.

Inward Noise Impact

The development lands in question are in proximity to the R113 dual carriageway to the east of the site. Noise from the dual carriageway has the potential to impact the residential developments proposed for the site itself.

Existing Noise Climate

The existing noise and vibration climate within the development lands was surveyed and the results summarised in Section 8.2 of this chapter. The results of the survey have indicated that the R113 contributes significant noise levels at the measurement location to the east of the site and Bothár Katharine Tynan and the LUAS line to the north of the site.

In order to determine the inward noise impact for noise sensitive properties proposed as part of the development, it is necessary to determine the internal noise levels within the proposed buildings. These can then be compared against appropriate internal noise criteria from BS 8233, as summarised in Section 8.4 (Table 8.5).

It is possible to calculate internal noise levels within the residential properties proposed within the site, taking account of the existing and future potential noise environment, proposed constructions and the relevant sound insulation provided by the building elements (i.e. walls, roof, glazing etc.).

Noise Risk Classification of the Site

Noise levels measured at the centre of the site during daytime periods are in the range of 47 to 64dB $L_{Aeq,16hr}$. Night time noise levels are the order of 50 to 51dB $L_{Aeq,8hr}$ across the site in this situation. The area of the site most exposed to a roadway and LUAS line is the northern most façade overlooking

Bóthar Katharine Tynan. This façade experienced daytime levels of the order of 66dB $L_{Aeq,15min}$ during the day.

Giving consideration to the measured noise levels presented in the previous sections the initial site noise risk assessment has concluded that the level of risk across the site varies from low to medium noise risk.

Additionally, the Stage 1 Noise Risk Assessment requires analyses of the L_{AFmax} noise levels. In the case of the AWN survey the L_{AFmax} noise levels typically measured less than 65dB during the night. ProPG guidance considers 20 night events over 80dB to be a high risk, therefore this site would be considered a medium risk in terms of maxima events.

ProPG states the following with respect to medium risks:

Medium Risk *As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.*

Given the above it can be concluded that the development site may be categorised as *Low to Medium Risk* and as such an Acoustic Design Strategy will be required to demonstrate that suitable care and attention has been applied in mitigating and minimising noise impact to such an extent that an adverse noise impact will be avoided in the final development.

It should be noted that ProPG states the following with regard to how the initial site noise risk is to be used,

"2.12 It is important that the assessment of noise risk at a proposed residential development site is not the basis for the eventual recommendation to the decision maker. The recommended approach is intended to give the developer, the noise practitioner, and the decision maker an early indication of the likely initial suitability of the site for new residential development from a noise perspective and the extent of the acoustic issues that would be faced. Thus, a site considered to be high risk will be recognised as presenting more acoustic challenges than a site considered as low risk. A site considered as negligible risk is likely to be acceptable from a noise perspective and need not normally be delayed on noise grounds. A potentially problematical site will be flagged at the earliest possible stage, with an increasing risk indicating the increasing importance of good acoustic design."

Therefore, following the guidance contained in ProPG does not preclude residential development on sites that are identified as having medium or high-risk noise levels. It merely identifies the fact that a more considered approach will be required to ensure the developments on the higher risk sites are suitably designed to mitigate the noise levels. The primary goal of the approach outlined in ProPG is to ensure that the best possible acoustic outcome is achieved for a particular site.

Façade Noise Levels

Noise levels have been measured in areas within and surrounding the development site during day and night-time periods. A large portion of the development is screened by the development itself as well as surrounding buildings. Assessment has been concentrated on the exposed facades overlooking Bóthar Katharine Tynan and Belgard Road. The facades closest to Belgard Road are those of commercial buildings and are not considered sensitive in the context of this impact assessment. Where façade noise levels are less than 55dB $L_{Aeq,16hr}$ during the day and 50dB $L_{Aeq,8hr}$ at night it is possible to achieve reasonable internal noise levels while also ventilating the dwellings with open windows. Therefore, for those properties where the façade noise levels are less than 55dB $L_{Aeq,16hr}$ during the day and 50dB $L_{Aeq,8hr}$ at night no further mitigation is required.

Where façade levels are above these levels the sound insulation performance of the building façade becomes important and a minimum sound insulation performance specification is required for windows and vents to ensure the internal noise criteria are achieved.

Figure 8.5 identifies those facades where the noise levels are higher and where mitigation in the form of enhanced glazing and ventilation will be required. The specification of this enhanced façade is discussed in Section 8.7.

Figure 8.5 Locations for Enhanced Acoustic Façade Specification

External Noise Levels

The vast majority of public open spaces are contained within blocks in form of courtyard areas. These areas will be largely screened from excess noise by the development itself. Therefore, external noise levels within public open spaces across the development site will generally be within the recommended range of noise levels from ProPG of between 50 – 55 dB $L_{Aeq,16hr}$. It is considered that the objectives of achieving suitable external noise levels is achieved within the overall site.

8.7 Remedial and Reductive Measures

8.7.1 Construction Phase

The assessment of construction phase impacts has found that significant noise and vibration impacts are not expected. Notwithstanding this, best practice noise and vibration control measures will be employed by the contractor during the construction phase in order to avoid significant impacts at the nearest sensitive buildings. The best practice measures set out in BS 5228 (2009 +A1 2014) Parts 1 and 2 will be adopted. This includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- selection of quiet plant;
- noise control at source;
- screening, and;
- liaison with the public.

8.7.2 Operational Phase

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.

Building Services Plant

Taking into account that sensitive receivers within the development are much closer than off-site sensitive receivers, once the relevant noise criteria included in Section 8.6 (i.e. cumulative noise level of 70dB(A) at a distance of 1m from any development facade) is achieved, it is expected that there will be no negative impact at sensitive receivers off site, and therefore no further mitigation required.

Inward Noise Impact

As is the case in most buildings, the glazed elements and ventilation paths of the building envelope are typically the weakest element from a sound insulation perspective. In general, all wall constructions (i.e. block work or concrete and spandrel elements) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal.

In this instance the facades highlighted in Figure 8.5 will be provided with glazing that achieves the minimum sound insulation performance as set out in Table 8.12. Other facades in the development have no minimum requirement for sound insulation.

Typical Glazing Specification	Octave Band Centre Frequency (Hz)						R_w
	125	250	500	1k	2k	4k	
10/12/6.4	27	29	36	41	42	52	40

Table 8.12 Sound Insulation Performance Requirements for Glazing, SRI (dB)

The overall R_w outlined above are provided for information purposes only. The over-riding requirement is the Octave Band sound insulation performance values which may also be achieved using alternative glazing configurations. Any selected system will be required to provide the same level of sound insulation performance set out in Table 8.12 or greater.

It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing system. In the context of the acoustic performance specification the ‘glazing system’ is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc.

In addition, any background ventilators through the façade, e.g. trickle vents, will be selected to achieve an acoustic performance of at least 38dB $D_{ne,w}$ when in the open position for those facades identified in Figure 8.5.

With these measures in place the internal noise levels within those proposed buildings most exposed to environmental noise from the R113 dual carriageway and Bothár Katharine Tynan and LUAS line will achieve the criteria outlined in Table 8.5 when the windows are closed and the ventilators are open.

Creche Inward Noise Impact

The creche is centrally located within the development far away from any of the major roads surrounding the site and will be likely be subject to screening of noise sources due to buildings. Therefore, no acoustic mitigation is required.

8.8 Predicted Impact of the Proposed Development

8.8.1 Construction Phase

During the construction phase of the project there is the potential for temporary noise impacts on nearby noise sensitive properties due to noise emissions from site activities. The application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum as far as practicable.

For the duration of the construction period, construction noise impacts will be short-term, negative, slight to moderate.

Vibration impacts during the construction phase will be short-term and negligible.

8.8.2 Operational Phase

The predicted change in noise levels associated with additional traffic is predicted to be of imperceptible impact along the existing road network. In the context of the existing noise environment, the overall contribution of induced traffic is considered to be of neutral, imperceptible and long-term impact to nearby residential locations.

Noise levels associated with building services plant are expected to be well within the adopted day and night-time noise limits at the nearest noise sensitive properties taking into account the site layout, the nature and type of units proposed and distances to nearest residences. Assuming the operational noise levels do not exceed the adopted design goals, the resultant residual noise impact from this source will be of neutral, imperceptible, long term impact.

8.9 Monitoring

8.9.1 Construction Phase

The contractor will be required to ensure construction activities operate within the noise limits set out within this assessment. The contractor will be required to undertake regular noise monitoring at locations representative of the closest sensitive locations to ensure the relevant criteria are not exceeded.

Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise*.

8.9.2 Operational Phase

Noise or vibration monitoring is not required once the development is operational.

8.10 Cumulative Impacts

Traffic volumes associated with the operational phase assessed within this chapter take account of other permitted developments in the local area. Cumulative noise impacts associated with the traffic generated from other developments in the surrounding environment have therefore been assessed within this chapter.

Given the site location and distance to other permitted developments it is not expected that there will be any cumulative noise or vibration impacts during either construction stage or operational stage.

9.0 AIR QUALITY AND CLIMATE

9.1 Introduction

This chapter assesses the likely air quality and climate impacts, if any, associated with the proposed mixed use residential development Cookstown, Dublin 24. A full description of the development can be found in Chapter 2.

This chapter was completed by Ciara Nolan, an environmental consultant in the air quality section of AWN Consulting Ltd. She holds an MSc. (First Class) in Environmental Science from University College Dublin and has also completed a BSc. in Energy Systems Engineering. She is an Associate Member of both the Institute of Air Quality Management and the Institution of Environmental Science. She has been active in the field of air quality for over 3 years, with a primary focus on consultancy. She has experience with preparing air quality and climate impact assessments for EIARs for various residential, mixed-use, commercial and industrial developments.

9.2 Assessment Methodology

9.2.1 Criteria for Rating of Impacts

Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Table 9.1 and Appendix 9.1).

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporate EU Directive 2008/50/EC, which has set limit values for NO_2, PM_{10}, $PM_{2.5}$, benzene and CO, which are applicable in relation to this project (see Table 9.1). Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions (see Appendix 9.1).

Pollutant	Regulation Note 1	Limit Type	Value
Nitrogen Dioxide (NO_2)	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 μg/m^3
		Annual limit for protection of human health	40 μg/m^3
		Critical level for protection of vegetation	30 μg/m^3 NO + NO_2
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
Benzene	2008/50/EC	Annual limit for protection of human health	5 μg/m^3
Carbon Monoxide	2008/50/EC	8-hour limit (on a rolling basis) for protection of human health	10 mg/m^3 (8.6 ppm)

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

Table 9.1 Ambient Air Quality Standards

Dust Deposition Guidelines

The concern from a health perspective is focussed on particles of dust which are less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$) and the EU ambient air quality standards outlined in Table 9.1 have set ambient air quality limit values for PM_{10} 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/(m^2*day) averaged over a one-year period at any receptors outside the site boundary. Recommendations from the Department of the Environment, Health & Local Government (DEHLG, 2004) apply the Bergerhoff limit of 350 mg/(m^2*day) to the site boundary of quarries. This limit value can also be implemented with regard to dust impacts from construction of the proposed development.

Gothenburg Protocol

In 1999, Ireland signed the Gothenburg Protocol to the 1979 UN Convention on Long Range Transboundary Air Pollution. The initial objective of the Protocol was to control and reduce emissions of Sulphur Dioxide (SO_2), Nitrogen Oxides (NO_X), Volatile Organic Compounds (VOCs) and Ammonia (NH_3). To achieve the initial targets Ireland was obliged, by 2010, to meet national emission ceilings of 42 kt for SO_2 (67% below 2001 levels), 65 kt for NO_X (52% reduction), 55 kt for VOCs (37% reduction) and 116 kt for NH_3 (6% reduction). In 2012, the Gothenburg Protocol was revised to include national emission reduction commitments for the main air pollutants to be achieved in 2020 and beyond and to include emission reduction commitments for $PM_{2.5}$.

European Commission Directive 2001/81/EC, the National Emissions Ceiling Directive (NECD), prescribes the same emission limits as the 1999 Gothenburg Protocol. A National Programme for the progressive reduction of emissions of these four transboundary pollutants has been in place since April 2005 (DEHLG, 2004; 2007). The data available from the EPA in 2020 (EPA, 2020a) indicated that Ireland complied with the emissions ceilings for SO_2 but failed to comply with the ceilings for NO_X, NH_3 and NMVOCs. Directive (EU) 2016/2284 "*On the Reduction of National Emissions of Certain Atmospheric Pollutants and Amending Directive 2003/35/EC and Repealing Directive 2001/81/EC*" was published in December 2016. The Directive will apply the 2010 NECD limits until 2020 and establish new national emission reduction commitments which will be applicable from 2020 and 2030 for SO_2, NO_X, NMVOC, NH_3, $PM_{2.5}$ and CH_4. In relation to Ireland, 2020 emission targets are 25 kt for SO_2 (65% on 2005 levels), 65 kt for NO_X (49% reduction on 2005 levels), 43 kt for VOCs (25% reduction on 2005 levels), 108 kt for NH_3 (1% reduction on 2005 levels) and 10 kt for $PM_{2.5}$ (18% reduction on 2005 levels). In relation to 2030, Ireland's emission targets are 85% below 2005 levels for SO_2, 69% reduction for NO_x, 32% reduction for VOCs, 5% reduction for NH_3 and 41% reduction for $PM_{2.5}$.

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 makes 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 *Climate Action Plan* (CAP) (Government of Ireland, 2019), published in June 2019, outlines the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlines the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The CAP also details 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 CAP has set a built environment sector reduction target of 40 - 45% relative to 2030 pre-NDP (National Development Plan) projections.

Following on from Ireland declaring a climate and biodiversity emergency in May 2019 and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme for the Climate Action (Amendment) Bill 2019 in December 2019 (Government of Ireland, 2020a). The General Scheme was prepared for the purposes of giving statutory effect to the core objectives stated within the CAP. It is expected that the new Climate Action (Amendment) Bill (the Bill) will be published before the end of 2020.

In October 2020, the Climate Action and Low Carbon Development (Amendment) Bill 2020 was published in draft format (draft 2020 Climate Act) which amends and enhances the 2015 Climate Act. Once approved, the purpose of the 2020 Climate Act is to provide for the approval of plans '*for the purpose of pursuing the transition to a climate resilient and climate neutral economy by the end of the year 2050'*. The 2020 Climate Act will also '*provide for carbon budgets and a decarbonisation target range for certain sectors of the economy'*. The 2020 Climate Act removes any reference to a national mitigation plan and instead refers to both the Climate Action Plan, as published in 2019, and a series of National Long Term Climate Action Strategies. In addition, the Environment Minister shall request each local authority to make a 'local authority climate action plan' lasting five years and to specify the mitigation measures and the adaptation measures to be adopted by the local authority.

The South Dublin County Council Climate Change Action Plan 2019 – 2024 published in 2019 (South Dublin County Council & Codema, 2019) outlines a number of goals and plans to prepare for and adapt to climate change in the key sectors of Energy & Buildings, Transport, Flood Resilience, Nature-Based Solutions and Resource Management. The plan outlines that for the first time, all four local authorities have joined together to develop Climate Change Action Plans as a collaborative response to the impacts of climate change. While each plan is unique to its functional area, they are unified in their approach to climate change adaptation. One of the primary aims of the plan is "*to make Dublin a climate resilient region, by reducing the impacts of future climate change-related events*". Some of the key actions involve developing public transport routes, increasing public bike facilities, energy master-planning, building retrofits with energy performance guarantees and flood resilient urban design. The implementation of these measures will enable the South Dublin County Council 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 clime friendly designs and measures where possible.

9.2.2 Construction Phase

The current assessment focuses on identifying the existing baseline levels of PM_{10} and $PM_{2.5}$ in the region of the proposed development by an assessment of EPA monitoring data. Thereafter, the impact of the construction phase of the development on air quality was determined by a qualitative assessment of the nature and scale of dust generating construction activities associated with the proposed development.

Construction phase traffic also has the potential to impact air quality and climate. The UK 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). The TII guidance (2011) was based on the previous version of the UK DMRB guidance (UK Highways Agency, 2007) and notes that the TII guidance should be adapted for any updates to the DMRB (see Section 1.1 of *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes, 2011)*.

- 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 guidance also states 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). The construction stage traffic does not meet the above scoping criteria and therefore, has been scoped out from any further assessment as there is no potential for significant impacts to air quality.

9.2.3 Operational Phase

Air Quality Assessment

The air quality assessment has been carried out following procedures described in the publications by the EPA (2002; 2003; 2015; 2017) and using the methodology outlined in the guidance documents published by the UK Highways Agency (2019) and UK Department of Environment Food and Rural Affairs (DEFRA) (2016; 2018). Transport Infrastructure Ireland (TII) reference the use of the UK Highways Agency and DEFRA guidance and methodology in their document *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (2011). This approach is considered best practice in the absence of Irish guidance and can be applied to any development that causes a change in traffic.

In 2019 the UK Highways Agency DMRB air quality guidance was revised with *LA 105 Air Quality* replacing a number of key pieces of guidance (HA 207/07, IAN 170/12, IAN 174/13, IAN 175/13, part of IAN 185/15). This revised document outlines a number of changes for air quality assessments in relation to road schemes but can be applied to any development that causes a change in traffic. Previously the DMRB air quality spreadsheet was used for the majority of assessments in Ireland with detailed modelling only required if this screening tool indicated compliance issues with the EU air quality standards. Guidance from Transport Infrastructure Ireland (TII, 2011) recommends the use of the UK Highways Agency DMRB spreadsheet tool for assessing the air quality impacts from road schemes. However, the DMRB spreadsheet tool was last revised in 2007 and accounts for modelled years up to 2025. Vehicle emission standards up to Euro V are included but since 2017, Euro 6d standards are applicable for the new fleet. In addition, the model does not account for electric or hybrid vehicle use. Therefore, this a somewhat outdated assessment tool. The LA 105 guidance document states that the DMRB spreadsheet tool may still be used for simple air quality assessments where there is unlikely to be a breach of the air quality standards. Due to its use of a “dirtier” fleet, vehicle emissions would be considered to be higher than more modern models and therefore any results will be conservative in nature and will provide a worst-case assessment.

The 2019 UK Highways Agency DMRB air quality revised guidance *LA 105 Air Quality* states that modelling should be conducted for NO_2 for the base, opening and design years for both the do minimum (do nothing) and do something scenarios. Modelling of PM_{10} is only required for the base year to demonstrate that the air quality limit values in relation to PM_{10} are not breached. Where the air quality modelling indicates exceedances of the PM_{10} air quality limits in the base year then PM_{10} should be included in the air quality model in the do minimum and do something scenarios. Modelling of $PM_{2.5}$ is not required as there are currently no issues with compliance with regard to this pollutant. The modelling of PM_{10} can be used to show that the project does not impact on the $PM_{2.5}$ limit value as if compliance with the PM_{10} limit is achieved then compliance with the $PM_{2.5}$ limit will also be achieved. Historically modelling of carbon monoxide (CO) and benzene (Bz) was required however, this is no longer needed as concentrations of these pollutants have been monitored to be significantly below their air quality limit values in recent years, even in urban centres (EPA, 2019a). The key pollutant reviewed in this assessment is NO_2. Concentrations of PM_{10} have been modelled for the base year to indicate that there are no potential compliance issues. Modelling of operational NO_2 concentrations has been conducted for the base year (2019) and the do nothing and do something scenarios for the opening year (2025) and design year (2040).

The TII guidance (2011) states that the assessment must progress to detailed modelling if:

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

The UK Highways Agency guidance *LA 150* (2019) scoping criteria outlined in Section 9.2.2 was used to determine the road links required for inclusion in the modelling assessment. Sensitive receptors within 200m of impacted road links are included within the modelling assessment. Pollutant concentrations are calculated at these sensitive receptor locations to determine the impact of the proposed development in terms of air quality. The guidance states a proportionate number of representative receptors which are located in areas which will experience the highest concentrations or greatest improvements as a result of the proposed development are to be included in the modelling (UK Highways Agency, 2019). The TII guidance (2011) defines sensitive receptor locations as: residential housing, schools, hospitals, places of worship, sports centres and shopping areas, i.e. locations where members of the public are likely to be regularly present. A worst-case commercial property (R1) and worst-case residential property (R2) have been included in the modelling assessment (see Figure 9.1).

The following model inputs are required to complete the assessment using the DMRB spreadsheet tool: road layouts, receptor locations, annual average daily traffic movements (AADT), percentage heavy goods vehicles (%HGV), annual average traffic speeds and background concentrations. Using this input data the model predicts the road traffic contribution to ambient ground level concentrations at the worst-case sensitive receptors using generic meteorological data. The DMRB model uses conservative emission factors, the formulae for which are outlined in the DMRB Volume 11 Section 3 Part 1 – HA 207/07 Annexes B3 and B4. These worst-case road contributions are then added to the existing background concentrations to give the worst-case predicted ambient concentrations. The worst-case ambient concentrations are then compared with the relevant ambient air quality standards to assess the compliance of the proposed development with these ambient air quality standards.

The TII document *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (2011) details a methodology for determining air quality impact significance criteria for road schemes which can be applied to any project that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. The TII significance criteria have been adopted for the proposed development and are detailed in Appendix 9.2 Table A9.2.1 and Table A9.2.2. The significance criteria are based on NO_2 and PM_{10} as these pollutants are most likely to exceed the annual mean limit values (40 µg/m^3).

Conversion of NO_X to NO_2

NO_X ($NO + NO_2$) is emitted by vehicles exhausts. The majority of emissions are in the form of NO, however, with greater diesel vehicles and some regenerative particle traps on HGV's the proportion of NO_X emitted as NO_2, rather than NO is increasing. With the correct conditions (presence of sunlight and O_3) emissions in the form of NO, have the potential to be converted to NO_2.

Transport Infrastructure Ireland states the recommended method for the conversion of NOx to NO_2 in *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (2011). The TII guidelines recommend the use of DEFRAs NOx to NO_2 calculator (2020) which was originally published in 2009 and is currently on version 8.1. This calculator (which can be downloaded in the form of an excel spreadsheet) accounts for the predicted availability of O_3 and proportion of NOx emitted as NO for each local authority across the UK. O_3 is a regional pollutant and therefore concentrations do not vary in the same way as concentrations of NO_2 or PM_{10}.

The calculator includes Local Authorities in Northern Ireland and the TII guidance recommends the use of ‘Armagh, Banbridge and Craigavon’ as the choice for local authority when using the calculator. The choice of Craigavon provides the most suitable relationship between NO_2 and NO_x for Ireland. The “All Other-Urban UK Traffic” traffic mix option was used.

Traffic Data Used in Modelling Assessment

Traffic flow information was obtained from NRB for the purposes of this assessment. Data for the Do Nothing and Do Something scenarios for the base year 2019, opening year 2025 and design year 2040 were provided. The %HGV was calculated by AWN using the site specific survey turning count data provided by NRB. The traffic data is detailed in Table 9.2 with the % HGV shown in parenthesis beside the AADT. Only road links that met the DMRB scoping criteria outlined in Section 9.2.2 and that were within 200m of receptors were included in the modelling assessment. Background concentrations have been included as per Section 9.3.3 of this chapter based on available EPA background monitoring data (EPA, 2020b).

This traffic data has also been used in the operational stage climate impact assessment.

Road Name	***Base Year***	***Do-Nothing***		***Do-Something***		***Speed (kph)***
	2019	***2025***	***2040***	***2025***	***2040***	
Cookstown Rd (E)	6,785 (3.9%)	6,989 (3.8%)	7,527 (3.6%)	8,024 (3.3%)	8,560 (3.1%)	50
Old Belgard Rd	8,125 (2.1%)	8,369 (2.0%)	9,013 (1.9%)	9,080 (1.9%)	10,458 (1.6%)	50
Cookstown Rd (W)	6,700 (2.5%)	6,905 (2.4%)	7,430 (2.2%)	8,551 (1.9%)	9,080 (1.8%)	50
Belgard Road (S)	25,243 (2.2%)	26,000 (2.1%)	28,000 (2%)	27,605 (2%)	29,610 (1.9%)	60
Belgard Road (N)	23,710 (2.3%)	24,421 (2.3%)	26,302 (2.1%)	25,435 (2.2%)	27,315 (2%)	60

Table 9.2 Traffic Data Used in Modelling Assessment

Figure 9.1 Location of Sensitive Receptors used in Air Quality Modelling Assessment

Climate Assessment

The UK Highways Agency has published an updated DMRB guidance document in relation to climate impact assessments *LA 114 Climate* (UK Highways Agency, 2019). The following scoping criteria are used to determine whether a detailed climate assessment is required for a proposed project during the operational stage. During operation, if any of the road links impacted by the proposed development meets one or more of the below criteria, then further assessment is required:

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

There are a number of road links that will experience an increase of 10% or more in the AADT. These road links have been included in the detailed climate assessment (see Table 9.2).

The impact of the proposed development at a national / international level has been determined using the procedures given by Transport Infrastructure Ireland (2011) and the methodology provided in Annex D in the UK Design Manual for Roads and Bridges (UK Highways Agency, 2007). The assessment focused on determining the resulting change in emissions of carbon dioxide (CO_2). The Annex provides a method for the prediction of the regional impact of emissions of these pollutants from road schemes and can be applied to any project that causes a change in traffic. The inputs to the air dispersion model consist of information on road link lengths, AADT movements and annual average traffic speeds (see Table 9.2).

Ecological Sites

For routes that pass within 2 km of a designated area of conservation (either Irish or European designation) the TII requires consultation with an Ecologist (2011). However, in practice the potential for impact to an ecological site is highest within 200 m of the proposed scheme and when significant changes in AADT (>5%) occur. Only sites that are sensitive to nitrogen deposition should be included in the assessment. In addition, the UK Highways Agency (2019) states that a detailed assessment does not need to be conducted for areas that have been designated for geological features or watercourses.

Transport Infrastructure Ireland's *Guidelines for Assessment of Ecological Impacts of National Road Scheme*s (2009) and *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities* (DEHLG, 2010) provide details regarding the legal protection of designated conservation areas.

If both of the following assessment criteria are met, an assessment of the potential for impact due to nitrogen deposition should be conducted:

- A designated area of conservation is located within 200 m of the proposed development: and
- A significant change in AADT flows (>5%) will occur.

There are no designated sites within 200m of any road links impacted by the proposed development therefore, there is no potential for nitrogen deposition and an assessment is not required.

9.3 Receiving Environment

9.3.1 Meteorological Data

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

The nearest representative weather station collating detailed weather records is Casement Aerodrome, which is located approximately 5 km west of the site. Casement Aerodrome met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 9.2). For data collated during five representative years (2015 – 2019), the predominant wind direction is westerly to south-westerly, with generally moderate wind speeds.

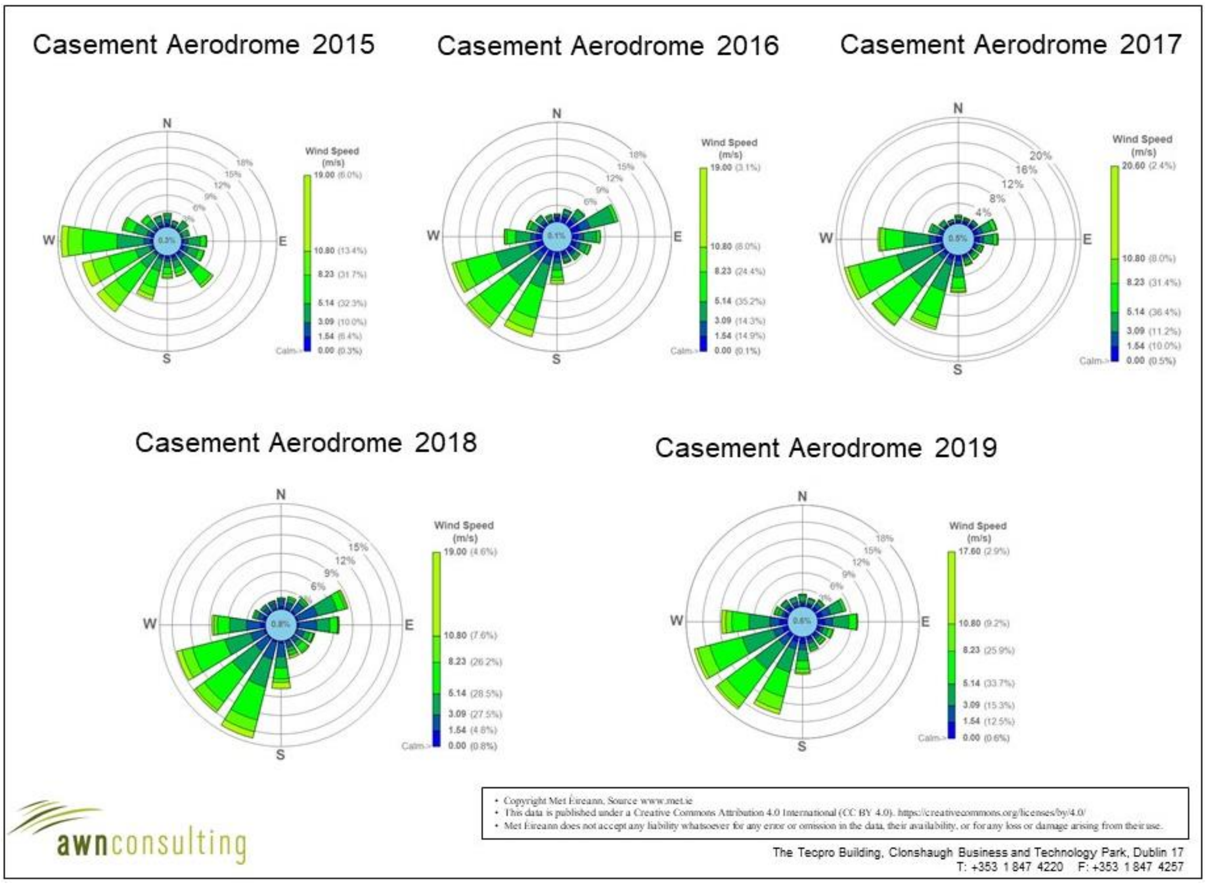


Figure 9.2 Casement Aerodrome Windroses 2015 – 2019

9.3.2 Trends in Air Quality

Air quality is variable and subject to both significant spatial and temporal variation. In relation to spatial variations in air quality, concentrations generally fall significantly with distance from major road sources (WHO, 2006). Thus, residential exposure is determined by the location of sensitive receptors relative to major roads sources in the area. Temporally, air quality can vary significantly by orders of magnitude due to changes in traffic volumes, meteorological conditions and wind direction.

In assessing baseline air quality, two tools are generally used: ambient air monitoring and air dispersion modelling. In order to adequately characterise the current baseline environment through monitoring, comprehensive measurements would be required at a number of key receptors for PM_{10} and NO_2. In addition, the key pollutants identified in the scoping study (PM_{10} and NO_2) have limit values which require assessment over time periods varying from one hour to one year. Thus, continuous monitoring over at least a one-year period at a number of locations would be necessary in order to fully determine compliance for these pollutants. Although this study would provide information on current air quality it would not be able to provide predictive information on baseline conditions (UK DETR, 1998), which are the conditions which prevail just prior to opening in the absence of the development. Hence the impacts of the development were fully assessed by air dispersion modelling (UK DETR, 1998) which is the most practical tool for this purpose.

The baseline environment has also been assessed using modelling, since the use of the same predictive technique for both the 'do-nothing' and 'do-something' scenario will minimise errors and allow an accurate determination of the relative impact of the development.

9.3.3 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 2019*" (EPA, 2020b). 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, 2020b).

As part of the implementation of the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2020c). 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, 2020c). 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.).

With regard to NO_2, continuous monitoring data from the EPA (EPA, 2020b) at suburban Zone A locations in Ringsend, Dun Laoghaire, Swords and Ballyfermot show that current levels of NO_2 are below both the annual and 1-hour limit values, with annual average levels ranging from 15 – 24 µg/m^3 in 2019 (see Table 9.3). Sufficient data is available for the stations in Ballyfermot, Dun Laoghaire and Swords to observe the long-term trend since 2014 (EPA, 2020b) (see Table 9.3), with results ranging from 13 – 20 µg/m^3 and few exceedances of the one-hour limit value. The station in Ballyfermot is approximately 5 km north of the proposed development site and monitored background concentrations would be representative of the site location. Concentrations of NO_2 at the Ballyfermot site over the period 2014 – 2019 ranged from 16 - 20 µg/m^3. Based on the above information, an estimate of the current background NO_2 concentration in the region of the proposed development is 17 µg/m^3.

Station	Averaging Period Notes 1, 2	Year					
		2014	2015	2016	2017	2018	2019
Rathmines	Annual Mean NO_2 (µg/m^3)	17	18	20	17	20	22
	Max 1-hr NO_2 (µg/m^3)	112	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	16	17	17	17	20
	Max 1-hr NO_2 (µg/m^3)	93	127	90	112	217	124
Dún Laoghaire	Annual Mean NO_2 (µg/m^3)	15	16	19	17	19	15
	Max 1-hr NO_2 (µg/m^3)	105	103	142	153	135	104
Swords	Annual Mean NO_2 (µg/m^3)	14	13	16	14	16	15
	Max 1-hr NO_2 (µg/m^3)	325	170	206	107	112	108

Note 1 Annual average limit value - 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Note 2 1-hour limit value - 200 µg/m^3 as a 99.8th%ile, i.e. not to be exceeded >18 times per year (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Table 9.3 Trends in Zone A Air Quality – Nitrogen Dioxide (NO_2)

Continuous PM_{10} monitoring carried out at the Zone A locations of Ballyfermot, Rathmines, Phoenix Park and Dún Laoghaire showed 2014 – 2019 annual mean concentrations ranging from 9 – 16 µg/m^3 (Table 9.4), with at most 9 exceedances (in Rathmines) of the 24-hour limit value of 50 µg/m^3 (35 exceedances are permitted per year). The most representative location is Ballyfermot which had an average annual mean concentration of 12.6 µg/m^3 over the six year period. Based on the EPA data

(Table 9.4) a conservative estimate of the current background PM_{10} concentration in the region of the proposed development is 13 µg/m^3.

Station	Averaging Period Notes 1, 2	Year					
		2014	2015	2016	2017	2018	2019
Ballyfermot	Annual Mean PM_{10} (µg/m^3)	11	12	11	12	16	14
	24-hr Mean > 50 µg/m^3 (days)	2	3	0	1	0	7
Rathmines	Annual Mean PM_{10} (µg/m^3)	14	15	15	13	15	15
	24-hr Mean > 50 µg/m^3 (days)	3	5	3	5	2	9
Phoenix Park	Annual Mean PM_{10} (µg/m^3)	12	12	11	9	11	11
	24-hr Mean > 50 µg/m^3 (days)	0	2	0	1	0	2
Dún Laoghaire	Annual Mean PM_{10} (µg/m^3)	14	13	13	12	13	12
	24-hr Mean > 50 µg/m^3 (days)	2	3	0	2	0	2

Note 1 Annual average limit value - 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Note 2 24-hour limit value - 50 µg/m^3 as a 90.4th%ile, i.e. not to be exceeded >35 times per year (EU Council Directive 1999/30/EC & S.I. No. 180 of 2011).

Table 9.4 Trends in Zone A Air Quality – PM_{10}

Continuous $PM_{2.5}$ monitoring carried out at the Zone A location of Rathmines showed $PM_{2.5}/PM_{10}$ ratios ranging from 0.53 – 0.68 over the period 2014 – 2019. Based on this information, a conservative ratio of 0.7 was used to generate a background $PM_{2.5}$ concentration in the region of the proposed development of 9.1 µg/m^3.

In terms of benzene, the annual mean concentration in the Zone A monitoring location of Rathmines ranged from 0.3 – 1.0 µg/m^3 for the period 2014 – 2019. An upper average annual mean concentration of 0.73 µg/m^3 was observed for this period. This is well below the limit value of 5 µg/m^3. Based on this EPA data an estimate of the background benzene concentration in the vicinity of the proposed development is 1.0 µg/m^3.

With regard to CO, annual averages at the Zone A, locations of Winetavern Street and Coleraine Street over the 2014 – 2019 period are low, peaking at 0.5 mg/m^3 which is 5% of the limit value of 10 mg/m^3. Based on this EPA data, an estimate of the background CO concentration in the region of the development is 0.5 mg/m^3.

Background concentrations for Opening Year 2025 and Design Year 2040 have been calculated. These have used current estimated background concentrations and the year on year reduction factors provided by Transport Infrastructure Ireland in the *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (2011) and the UK Department for Environment, Food and Rural Affairs LAQM.TG(16) (2018).

9.3.4 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 emissions up to 2018 (EPA, 2020d). Agriculture is the largest contributor in 2018 at 33.9% of the total, with the transport sector accounting for 20.1% of emissions of CO_2.

The data published in 2020 indicates that Ireland has exceeded its 2018 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC1 by 5.69 Mt. For 2018, total national greenhouse gas emissions are to be 60.93 million tonnes carbon dioxide equivalent (Mt CO_2eq). This is 0.1% lower (0.07 Mt CO_2eq) than emissions in 2017.

The EPA 2019 GHG Emissions Projections Report for 2018 – 2040 (EPA 2019b) 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. 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 – 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 10 Mt CO_2eq under the "With Existing Measures" scenario and 9 Mt CO_2eq under the "With Additional Measures" scenario (EPA, 2019b).

9.4 Characteristics Of The Proposed Development

The site is located in Cookstown Industrial Estate, Dublin 24. 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.

9.4.1 Construction Phase

The key elements of construction of the proposed development with potential for air quality and climate impacts are:

- Potential fugitive dust emissions from general site preparation and construction activities;
- Potential fugitive dust emissions from trucks associated with construction;
- Engine emissions from construction vehicles and machinery.

The construction phase impacts will be short-term in duration.

9.4.2 Operational Phase

The key elements of operation of the proposed development with potential for air quality and climate impacts are:

- A change in traffic flows on road links nearby the proposed development.

The potential sources of air and climatic emissions during the operational phase of the proposed development are deemed long-term.

9.5 Potential Impact Of The Proposed Development

9.5.1 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).

9.5.2 Construction Phase

Air Quality

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust and PM_{10}/$PM_{2.5}$ emissions (Table 9.5). While construction dust tends to be deposited within 200m of a construction site, the majority of the deposition occurs within the first 50m. The closest high sensitivity receptors (residential properties) to the site are approximately 90 – 100m to the north-west and east of the site in The Dale and Redwood Court housing estates. There are some commercial and industrial premises in close proximity to the site, however, these are regarded as having low sensitivity. In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of a Dust Management Plan. Provided the dust minimisation measures outlined in the plan (see Appendix 9.3) are adhered to, the air quality impacts during the construction phase will not be significant. These measures are summarised in Section 9.6.1.

Source		Potential Distance for Significant Effects (Distance From Source)		
Scale	**Description**	**Soiling**	**PM_{10}**	**Vegetation Effects**
Major	Large construction sites, with high use of haul roads	100m	25m	25m
Moderate	Moderate sized construction sites, with moderate use of haul roads	50m	15m	15m
Minor	Minor construction sites, with limited use of haul roads	25m	10m	10m

Table 9.5 Assessment Criteria for the Impact of Dust from Construction, with Standard Mitigation in Place (TII, 2011)

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase. Particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the DMRB assessment criteria in Section 9.2.2 and referenced below.

- 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.

It can therefore be determined that the construction stage traffic will have an imperceptible, negative, localised and short-term impact on air quality.

Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO_2 and N_2O emissions. The Institute of Air Quality Management Document *Guidance on the Assessment of Dust from Demolition and Construction* (IAQM, 2014) states that site traffic and plant is unlikely to make a significant impact on climate. Therefore, the impact on climate is considered to be imperceptible, negative and short term.

Human Health

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health (Table 9.1). Therefore, the impact of construction of the proposed development is likely to be short-term and imperceptible with respect to human health.

9.5.3 Operational Phase

Air Quality

The impact of the proposed development has been assessed by modelling emissions from the traffic generated as a result of the development. The impact of NO_2 emissions for the opening and design years was predicted at the nearest sensitive receptors to the development. The assessment was conducted for two worst-case receptors within 200m of the impacted road links, a nearby commercial property which is of medium sensitivity and a residential dwelling in Redwood Court which is of high sensitivity. This assessment allows the significance of the development, with respect to both relative and absolute impacts, to be determined.

Transport Infrastructure Ireland's document *Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes* (2011) detail a methodology for determining air quality impact significance criteria for road schemes and this can be applied to any development that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the 'Do-Nothing' scenario, which assumes that the proposed development is not in place in future years, in order to determine the degree of impact.

The results of the assessment of the impact of the proposed development on NO_2 in the opening year 2025 are shown in Table 9.6 and for design year 2040 are shown in Table 9.7. The annual average concentration is in compliance with the limit value at the worst-case receptor in 2025 and 2040. Concentrations of NO_2 are at most 50% of the annual limit value in 2025 and at most 49% in 2040. There are some increases in traffic volumes between 2025 and 2040, therefore any reductions in concentrations is due to decreased background values. In addition, the hourly limit value for NO_2 is 200 $\mu g/m^3$ and is expressed as a 99.8th percentile (i.e. it must not be exceeded more than 18 times per year). The maximum 1-hour NO_2 concentration is not predicted to be exceeded in any modelled year (Table 9.8).

The impact of the proposed development on annual mean NO_2 concentrations can be assessed relative to "Do Nothing (DN)" levels. Relative to baseline levels, there are predicted to be some imperceptible increases in NO_2 concentrations at receptors R1 and R2. Concentrations will increase by at most 1% of the annual limit value in 2025 or 2040 at receptor R1. Concentrations will increase by at most 0.1% of the annual limit value at receptor R2 in 2025 or 2040. Using the assessment criteria outlined in Appendix 9.2, Table A9.2.1 and Table A9.2.2 the impact of the proposed development in terms of NO_2 is considered negligible. Therefore, the overall impact of NO_2 concentrations as a result of the proposed scheme is long-term, negative and imperceptible.

Concentrations of PM_{10} were modelled for the baseline year of 2019. The modelling showed that concentrations were in compliance with the annual limit value of 40 $\mu g/m^3$ at all receptors assessed, therefore, further modelling for the opening and design years was not required as per the UK Highways Agency guidance (2019). Concentrations reached at most 0.63 $\mu g/m^3$ excluding background concentrations. When a background concentration of 13 $\mu g/m^3$ is included the overall impact is 34% of the annual limit value at the worst case receptor.

The impact of the proposed development on ambient air quality in the operational stage is considered long-term, localised, negative and imperceptible.

Receptor	Impact Opening Year				
	DN	DS	DS-DN	Magnitude	Description
R1	18.4	18.8	0.35	Imperceptible	Negligible Increase
R2	20.1	20.1	0.05	Imperceptible	Negligible Increase

Note 1 Based on UK Highways Agency IAN technique for predicting future NO_2 concentrations

Table 9.6 Predicted Annual Mean NO_2 Concentrations – Opening Year 2025 ($\mu g/m^3$)

Receptor	Impact Design Year				
	DN	DS	DS-DN	Magnitude	Description
R1	17.9	18.3	0.40	Imperceptible	Negligible Increase
R2	19.4	19.4	0.04	Imperceptible	Negligible Increase

Note 1 Based on UK Highways Agency IAN technique for predicting future NO_2 concentrations

Table 9.7 Predicted Annual Mean NO_2 Concentrations – Design Year 2040 ($\mu g/m^3$)

Receptor	Opening Year		Design Year	
	DN	DS	DN	DS
R1	64.5	65.7	62.6	63.9
R2	70.3	70.5	67.9	68.1

Table 9.8 Predicted 99.8th percentile of Daily Maximum 1-hour NO_2 Concentrations ($\mu g/m^3$)

Climate

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on site in future years. A detailed flood risk assessment has been undertaken as part of this planning application and adequate attenuation and drainage have been provided for to account for increased rainfall in future years. Therefore, the impact will be imperceptible.

There is the potential for a number of greenhouse gas emissions to atmosphere during the operational phase of the development. The predicted concentrations of CO_2 for the future years of 2025 and 2040 are detailed in Table 9.9. These are significantly less than the 2020 and 2030 targets set out under EU legislation. It is predicted that in 2025 the proposed development will increase CO_2 emissions by 0.00021% of the EU 2020 target. In 2040 CO_2 emissions will increase by 0.00025% of the 2030 target. Therefore, the climate impact of the proposed development is considered negative, long-term and imperceptible.

Year	Scenario	CO_2 (tonnes/annum)
2025	Do Nothing	1,135
	Do Something	1,213
2040	Do Nothing	1,215
	Do Something	1,299
Increment in 2025		78.4 Tonnes
Increment in 2040		83.4 Tonnes
Emission Ceiling (kilo Tonnes) 2020		**37,943**
Emission Ceiling (kilo Tonnes) 2030		**32,860**
Impact in 2025 (%)		0.00021 %
Impact in 2040 (%)		0.00025 %

Note 1 Target under *European Commission Decision 2017/1471 of 10th August 2017 and amending decision 2013/162/EU to revise Member States' annual emissions allocations for the period from 2017 to 2020*

Note 2 Target under *Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013*

Table 9.9 Climate Impact Assessment

In addition, the proposed development has been designed to reduce the impact to climate where possible, the following measures have been incorporated into the design of the development as outlined in the Building Lifecycle Report prepared for this application:

- The development will be Part L compliant and will achieve the standards of the NZEB;
- Natural light will be utilised as much as possible to reduce the need for artificial lighting;
- PV solar panels will be installed;
- EV car charging points will be provided to encourage cleaner modes of transport;
- Increased bicycle parking will be provided to promote the use of alternative, cleaner modes of transport;
- Car sharing parking spaces will also be provided.

These measures along with the full list of measures in the Building Lifecycle Report will reduce the operational phase impact to climate in the long-term.

Human Health

Traffic related air emissions have the potential to impact air quality which can affect human health. However, air dispersion modelling of traffic emissions has shown that levels of all pollutants are below the ambient air quality standards set for the protection of human health. It can be determined that the impact to human health during the operational stage is long-term, negative and imperceptible.

9.5.4 Cumulative Impact

Should the construction phase of the proposed development coincide with the construction of any other permitted developments within 350m of the site then there is the potential for cumulative dust impacts to the nearby sensitive receptors according to the IAQM guidance (IAQM, 2014). A review of granted planning permissions over the past 10 year period within a 350m radius of the site was conducted. It was found that the development of a data storage facility under planning reference SD18A/0219 approximately 250m to the south east of the proposed development site may result in cumulative construction dust impact should the construction phases of the two developments coincide. In addition, the other phases of the proposed Cookstown development may result in cumulative dust impacts should the construction phase coincide with that of the proposed development.

The dust mitigation measures outlined in Appendix 9.3 will be applied throughout the construction phase of the proposed development which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the proposed development are deemed short-term and not significant.

Cumulative construction phase impacts to climate are not predicted due to the scale and nature of the development and the cumulative area.

Cumulative impacts have been incorporated into the traffic data supplied for the operational stage air and climate modelling assessments where such information was available. The results of the modelling assessment (section 9.5.3) show that there is a long-term, negative and imperceptible impact to air quality and climate during the operational stage.

9.6 Remedial Or Reductive Measures

9.6.1 Construction Phase

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the Dust Management Plan. The key aspects of controlling dust are listed below. Full details of the Dust Management Plan can be found in Appendix 9.3. These measures will be incorporated into the overall Construction Management Plan (CMP) for the site.

In summary the measures which will be implemented will include:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

9.6.2 Operational Phase

The impact of the proposed development on air quality and climate is predicted to be imperceptible with respect to the operational phase in the long term. Therefore, no site specific mitigation measures are required.

9.7 Predicted Impact Of The Proposed Development

9.7.1 Construction Phase

With the implementation of the dust mitigation measures, associated with a high level of dust control, outlined in Section 9.6.1 and Appendix 9.3 dust impacts from the construction phase will be localised, imperceptible, negative and short-term but will not pose a nuisance at nearby receptors.

9.7.2 Operational Phase

The operational phase air quality and climate modelling assessments determined that there is no potential for significant impacts 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, negative, imperceptible and long-term.

9.8 Monitoring

Due to the nature of the area and the absence of high sensitivity residential receptors in close proximity to the proposed development site, there is no monitoring recommended for the construction and operational phases of the development. The impact assessment concluded that impacts to air quality and climate are predicted to be imperceptible as a result of the proposed development.

9.9 References

BRE (2003) Controlling Particles, Vapours & Noise Pollution From Construction Sites

DEHLG (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities

Department of the Environment, Heritage and Local Government (2010) Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities

Environmental Protection Agency (2002) Guidelines On Information To Be Contained in Environmental Impact Statements

Environmental Protection Agency (2003) Advice Notes On Current Practice (In The Preparation Of Environmental Impact Statements)

Environmental Protection Agency (2015) Advice Notes for Preparing Environmental Impact Statements – Draft

Environmental Protection Agency (2017) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports - Draft

Environmental Protection Agency (2019b) Ireland's Final Greenhouse Gas Emissions 1990 – 2018

Environmental Protection Agency (2019c) GHG Emissions Projections Report - Ireland's Greenhouse Gas Emissions Projections 2018 - 2040

Environmental Protection Agency (2020a) Ireland's Transboundary Gas Emissions 1990 –2030

Environmental Protection Agency (2020b) Air Quality Monitoring Report 2019 (& previous annual reports)

Environmental Protection Agency (2020c) EPA website Available at: http://www.epa.ie/whatwedo/monitoring/air/

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 (2019) Climate Action Plan 2019

Government of Ireland (2020a) Draft General Scheme of the Climate Action (Amendment) Bill 2019

Government of Ireland (2020b) Climate Action and Low Carbon Development (Amendment) Bill 2020

Institute of Air Quality Management (IAQM) (2014) Guidance on the Assessment of Dust from Demolition and Construction Version 1.1

Met Éireann (2020) Met Eireann website: https://www.met.ie/

South Dublin County Council & Codema (2019) South Dublin County Council Climate Change Action Plan 2019 – 2024

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 (2009) Guidelines for Assessment of Ecological Impacts of National Roads Schemes (Rev. 2, Transport Infrastructure Ireland, 2009)

Transport Infrastructure Ireland (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes

UK DEFRA (2016) Part IV of the Environment Act 1995: Local Air Quality Management, LAQM. PG(16)

UK DEFRA (2018) Part IV of the Environment Act 1995: Local Air Quality Management, LAQM.TG(16)

UK DEFRA (2020) NO_x to NO_2 Conversion Spreadsheet (Version 8.1)

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)

10.0 MATERIAL ASSETS - TRAFFIC/TRANSPORTATION/ROADS AND WATER SUPPLY & DRAINAGE

TRAFFIC/TRANSPORTATION/ROADS

10.1 Executive Summary

The NRB work included advising in relation to the residential development layout design, liaising South Dublin County Council Roads/Transportation Officials, and subsequently preparing a Transportation Assessment Report, a Mobility Management Plan, a DMURS Statement of Consistency and commissioning an independent Road Safety Audit of the design. All of these documents are presented herein as an appendix to this EIAR.

10.2 Background

Initial reports and studies were prepared and submitted to ABP as part of the Pre-Application Consultation process. This report and the associated amended design and documentation incorporates responses to the ABP issues raised and in particular to the ABP Opinion Item #2. The design has evolved to include lands within the control of Dublin City Council and South Dublin County Council to ensure that the layout accords with the requirements of the Tallaght LAP and DMURS in terms of creating a well-connected integrated community. This design approach has ensured that best practice Transportation & Sustainable Planning Policies have informed the current design of the development.

10.3 Introduction

This chapter has been prepared by Mr. Eoin Reynolds, Director of NRB Consulting Engineers Ltd. Eoin is a Chartered Engineer with over 30 years' experience in a wide range of civil engineering projects. He specialises in the field of Traffic & Transportation and Roads Design - assessing the infrastructure needs of development. Eoin provides advice to both private sector and public sector clients on all aspects of roads, traffic and transportation, and mobility management. Eoin is expert in the use of Traffic Engineering Modelling Software (TRICS, ARCADY, PICADY, LINSIG, TRANSYT and Micro-Simulation Techniques). He has given expert evidence at planning appeals, oral hearings and public enquiries. Eoin was previously Director of the Irish Office of Waterman Boreham Transport Planning and prior to that was Manager of the Belfast office of JMP Consultants Ltd. He is a noted Professional/Expert Witness in the field of Traffic/Roads & Road Safety.

A full Transportation Assessment has been undertaken in order to assess the effect of the proposed development in accordance with the TII Guidelines for Traffic/Transportation Assessment, and having due regard also to the provisions of the local planning and transport policies of the South Dublin County Development Plan 2016-2022 and the Tallaght Town Centres Local Area Plan 2020-2026. This Assessment is included herewith as Appendix 10.1 which also includes a detailed preliminary Mobility Management Plan and a Stage 1 Independent Road Safety Audit. These reports and the associated amended design and documentation responds to the ABP issues raised and in particular to the ABP Opinion Item #2. This Chapter of the EIAR therefore represents a summary of the detailed Transportation assessment undertaken as part of the Strategic Housing Development (SHD) Application to An Bord Pleanála (ABP) for the proposed Cookstown Castle development.

10.4 Research Methodology

This Transportation Assessment (TA) has been prepared by NRB Consulting Engineers Ltd and addresses the Traffic / Transportation issues arising from the proposal to construct and occupy a total of 1,104 apartments/duplexes & the ancillary commercial elements, on the zoned sites at Cookstown Industrial Estate, Tallaght. The report and study has been prepared in accordance with the TII Traffic & Transport Assessment Guidelines (2014).

In describing the Receiving Environment and the Proposed Future Environment, this report addresses the following aspects of the proposed development:

- Relatively Small Scale of the development in Traffic terms (conscious of the long-established use and nature of the existing site);
- Location of the development in close proximity to the Tallaght Town Centre and adjacent to high capacity Public Transport Links;
- Traffic & Transportation impact;
- Capacity of the proposed vehicular accesses to accommodate the worst-case development traffic flows;
- Capacity of the Existing Road Network;
- Adequacy and safety of the existing roads and junctions locally, within the area of influence (with the replacement of roundabouts with Traffic Signal Control);
- Strategic Road improvements that will significantly further reduce impact and increase local permeability (including the construction of the now proposed local roads infrastructure and the Part 8 N-S Link connecting Cookstown Industrial Estate Road through to Belgard Square North, and also the 3rd party Proposal to construct an E-W Link Road through to Belgard Road adjacent B&Q); and
- The Upgrade of the existing Industrial Estate Roundabouts to Traffic Signal Control incorporating controlled dedicated pedestrian crossing facilitates - which is considered more appropriate in a Town Centre Environment.

Recommendations contained within this Transportation Assessment are based on the following sources of information and industry-standard practices: -

- The TII Traffic & Transport Assessment Guidelines,
- Design Manual for Urban Roads and Streets,
- Recent Weekday AM and PM Peak Classified Turning Movements Traffic Survey Data commissioned,
- TII Design Guidance,
- A review of South Dublin County Development Plan 2016-2022, Tallaght LAP Roads/Traffic and Transportation Policies & Recommendations,
- Our experience in assessing the impact of Developments of this Nature, and
- Site visits and observations.

10.5 Receiving Environment

The site is within the long-established Cookstown Industrial Estate, which clearly has roads and kerbing which is Commercial/Industrial in nature and design, with high kerb and infrastructure links that were constructed to support industrial uses, but which are inappropriate for an emerging residential area. The inappropriate nature and design of the roads and links is being addressed as part of the planning application. The sites are currently accessed by vehicular traffic by way of Belgard Road, Old Belgard Road, and Cookstown Road.

Cookstown Road is a single carriageway 2-way road, with high protective (kassel) kerbing, verges and footpaths along both sides. It is currently subject to a 50kph speed restriction and is relatively lightly trafficked. It runs in an approximate E-W orientation through the site (as an extension to First Avenue), and also extends along the western boundary of the site where it is oriented in an approximate N-S direction. The Traffic survey indicated that the road carries a weekday AM Peak Hour 2-Way traffic flow of approximately 600 Passenger Car Units (PCUs) and a 2-way flow of 590 PCUs in the PM Peak Hour. In these terms, the road is considered moderately trafficked in terms of its link carrying capacity.

First Avenue consists of a single carriageway 2-way road, running generally in an E-W orientation, located west of the development site. It too is subject to a 50kph speed limit, and has pedestrian footpaths along its length, combined with intermittent verges and parallel parking areas. The Traffic Survey indicated that the First Avenue to the west carries a weekday AM Peak Hour traffic flow of approximately 190 PCUs, and a traffic flow of approximately 140 PCUs in the PM Peak Hour. In these terms, the road is considered very lightly trafficked in terms of its link carrying capacity.

A review of the Road Safety Authority (RSA) on-line database of reported road traffic accidents confirms that there have been no relevant accidents on the adjacent affected roads during the reported period 2005 to date, that are considered relevant or which will be affected by the proposed development. An extract from the RSA Database is included below at Figure 10.1.

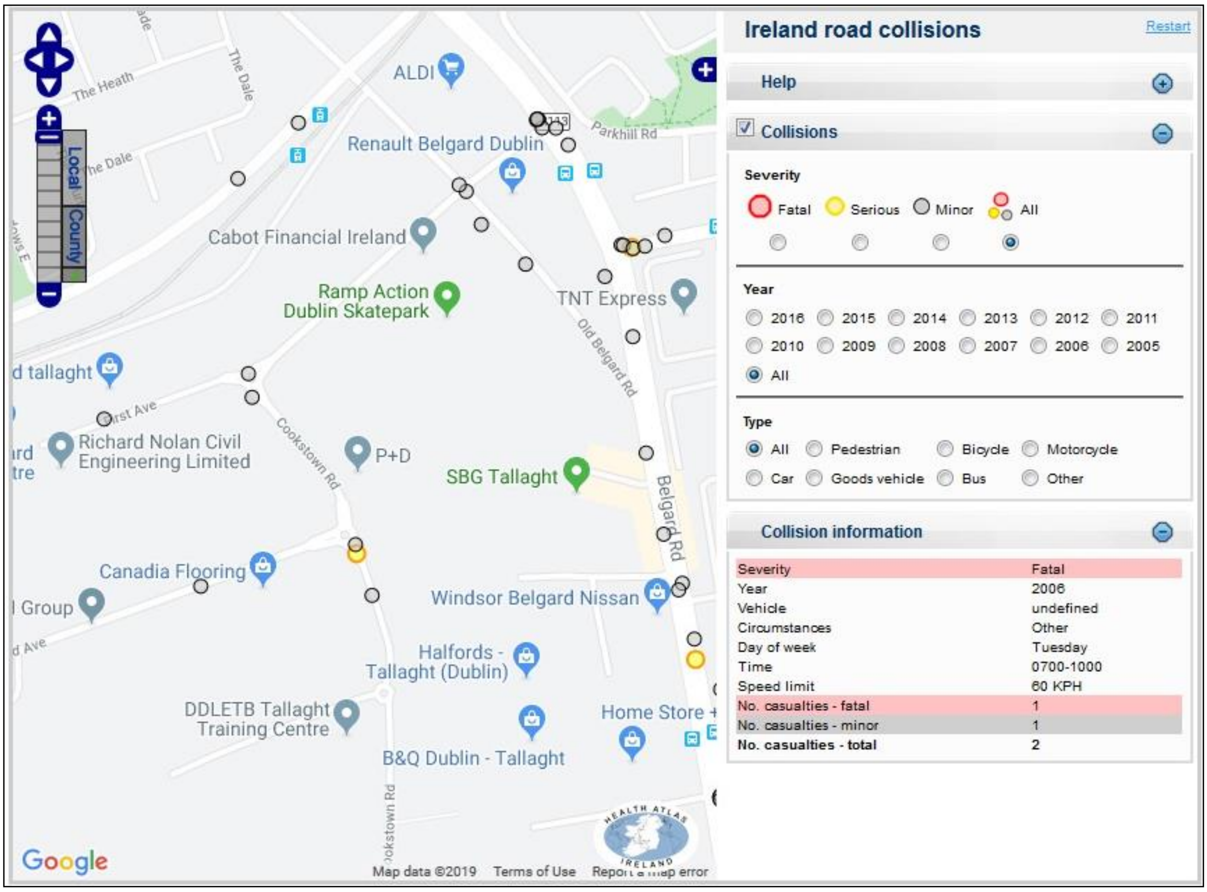


Figure 10.1 Extract from the RSA Database illustrating relevant accidents on adjacent affected roads during the reported period 2005 to date

10.6 Characteristics of the Proposed Development

The subject development sites are located on lands within Cookstown Industrial Estate and an illustration of the elements of the development is extracted from the Architects Plans and is included overleaf at Figure 10.2.

The content of the individual Blocks is as set out on the detailed Architectural Schedule of Accommodation, but in terms of Traffic/Transportation Assessment it is summarised below in Table 10.1 overleaf for convenience.

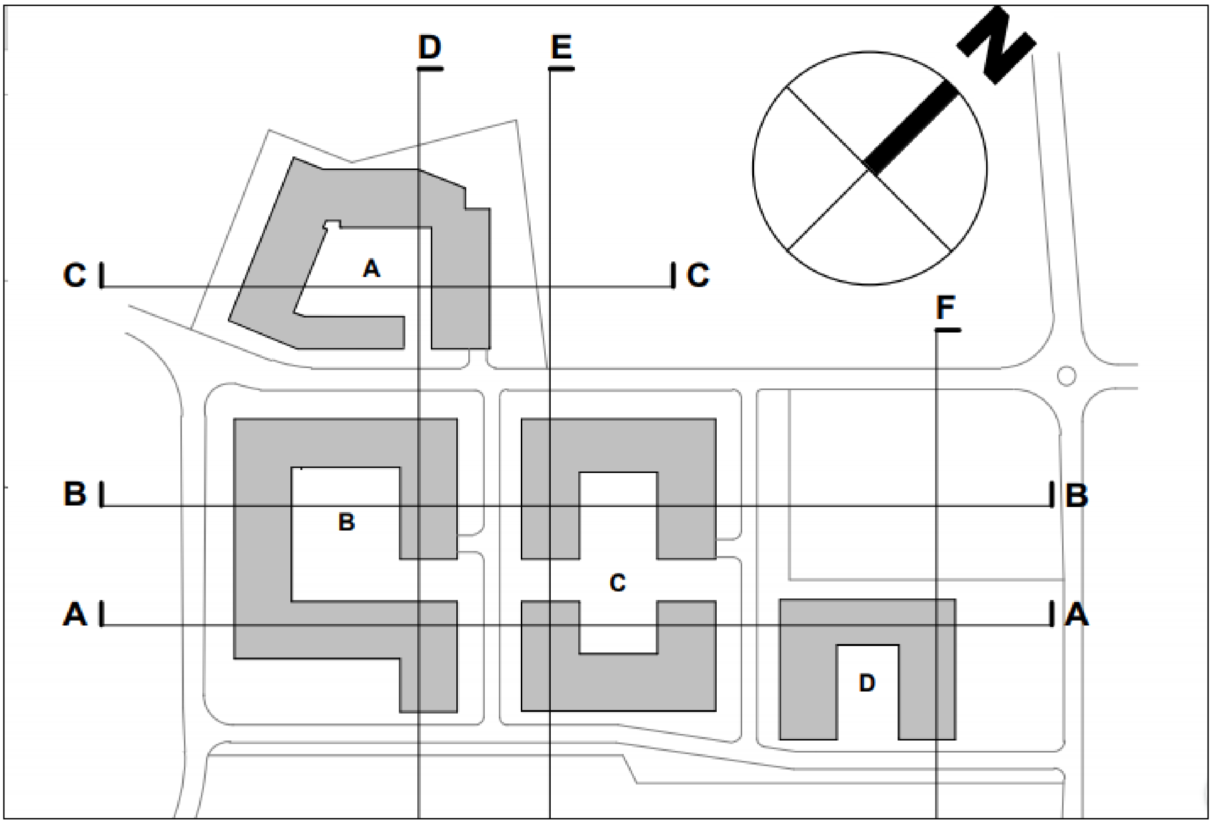


Figure 10.2 Plan excerpt indicating application site within Cookstown Industrial Estate

Block (Reference Figure 10.2)	Contents
Block A	• 260 Apartments/Duplex Units, • Ancillary Residential Amenity Space, • Under-croft with 72 Car Parking Spaces & 540 Cycle Parking spaces
Block B	• 342 Apartments Units, • Ancillary Residential Amenity Space, • Ancillary Communal Space for Residents, • 285m^2 GFA Commercial Space, • Under-croft with 57 Car Parking Spaces & 226 Cycle Parking Spaces
Block C	• 350 Apartments Units, • Ancillary Residential Amenity Space, • Ancillary Communal Crèche Space (272m^2 GFA), • Under-croft with 42 Car Parking Spaces & 336 Cycle Parking Spaces
Block D	• 152 Apartments Units, • Ancillary Residential Amenity Space, • 1,500m^2 GFA Local Office Space, • 477m^2 GFA Commercial Space • 30 Car Parking Spaces & 252 Cycle Parking Spaces • Existing Garage & Forecourt
Surface Level	• A Total of 396 Visitor Cycle Parking Spaces, • A Total of 131 Surface On-Street Car Parking Spaces, • 16 Car Share (***Go-Car***) spaces included with a commitment from ***Go-Car***

Table 10.1 Development Content by Block for Transportation Assessment Purposes

Based on the summary as set out above, the entire site has a total of 1,104 Apartments set out in individual blocks with streets and infrastructure arranged in traditional N-S and E-W blocks, consistent with the Local Area Plan, and as illustrated in the Layout drawings. The development includes copious secure bicycle parking, limited car parking & refuse management/residential storage areas within the dedicated areas. Car Parking Quantum is addressed further within the Parking Section of the appended Transportation Assessment Report. Importantly, it is proposed to remove and reconstruct the existing industrial estate roads consistent with the best practice design requirements of a residential urban area, removing and replacing the existing Industrial-type roads and road infrastructure, with the benefit of improved linkage to Belgard LUAS Stop.

The Trip Rate Information Computer System (TRICS) database is used to ascertain vehicular trip generation associated with the use of any particular site. This represents industry standard practice for Transportation Assessments in Ireland.

In this case the worst case assessment is based on TRICS, and a robust and onerous assessment has been undertaken in order to ensure that we thoroughly assess the impact, in terms of stress-testing the access junctions and the road capacity impact of the scheme. In this case the assessment has not considered the beneficial diluting effect of the proposed road improvements, apart from the recommended upgrade of the adjacent roundabouts to traffic signal control, and this therefore represents a robust assessment of impact as traffic generated is assumed to be concentrated within the existing network rather than within a more permeable network as planned by South Dublin County Council.

The Trip Rates applied in this case for each individual Block are as summarised below and overleaf in Tables 10.2, 10.3, 10.4 and 10.5 and are as individually broken down and extracted from the relevant TRICS Database (data enclosed within Appended Transportation Assessment Report).

Network Period	PCU Arrivals	PCU Departures	Total 2-Way Traffic
Weekday AM Peak Hr	15	51	66
Weekday PM Peak Hr	47	22	69

Table 10.2 TRICS Data Summary -Worst Case Traffic Generation BLOCK A

Network Period	PCU Arrivals	PCU Departures	Total 2-Way Traffic
Weekday AM Peak Hr	38	84	122
Weekday PM Peak Hr	86	57	143

Table 10.3 TRICS Data Summary - Worst Case Traffic Generation BLOCK B

Network Period	PCU Arrivals	PCU Departures	Total 2-Way Traffic
Weekday AM Peak Hr	29	77	106
Weekday PM Peak Hr	70	38	108

Table 10.4 TRICS Data Summary - Worst Case Traffic Generation BLOCK C

Network Period	PCU Arrivals	PCU Departures	Total 2-Way Traffic
Weekday AM Peak Hr	39	40	79
Weekday PM Peak Hr	40	44	84

Table 10.5 TRICS Data Summary - Worst Case Net Traffic Generation BLOCK D

10.7 Potential Impact of The Proposed Development

For developments of the nature proposed, if they are large generators of vehicular traffic movements, there is the potential for their construction and occupation to have an adverse impact upon the safety, capacity and operation of the adjacent road network. In these terms, the assessment undertaken was to determine whether there was likely to be an adverse impact.

10.8 Mitigation and Remedial Measures

All existing roads infrastructure, and footpaths, which were designed to facilitate the historic operation of Cookstown Industrial Estate will be removed and replaced with modern high quality DMURS compliant roads, cycleways and footpaths that create an accessible residential street network within the boundary of the proposed development site. In addition, an improved direct pedestrian link to Belgard LUAS is proposed. Copious bicycle parking is provided, together with limited and managed car parking, as illustrated in Table 10.1 above, which shows the provision per residential block.

Car parking is being provided significantly below the maximum standards as set out within the South Dublin County Development Plan 2016-2022, with on average an approximate ratio of 0.3 per residential unit, including on-street provision. The lower provision of car parking will act as a demand management measure, ensuring that the development is accessed in the most sustainable manner, being almost predominantly reliant on non-car modes of travel. The lower provision of car parking is supported by a working Mobility Management Plan.

In terms of number of transport alternatives easily available to Residents, it is considered that the proposed development is very highly sustainable indeed, in terms of public and alternative transport accessibility. The proximity of the development to existing public transport services means that all residents will have viable alternatives to the private car for accessing the site and will not be reliant upon the car as a primary mode of travel.

10.9 Predicted Impact of the Proposed Development

The Institution of Highways and Transportation (IHT) Guidelines for Traffic Impact Assessment and the TII Traffic and Transport Assessment Guidelines sets out a mechanism for the traffic [capacity] assessment of developments of this nature and determining whether further assessment is indeed required. This industry standard process requires a **Threshold Assessment** of the impact on the local roads to be provided in order to determine whether further more detailed traffic modelling and assessment of particular critical junctions is necessary.

The technical guidance referenced above sets out specific thresholds for increases in traffic volume associated with new development, which, if breeched, requires further detailed analysis to be undertaken. The recommendation is that, if the expected increase is 5% or greater, then further analysis is warranted in circumstances where junctions are within but are nearing capacity in traffic terms. It should be noted that the observed and surveyed existing traffic on the affected roads within the Cookstown Industrial Estate are considered very low, and against this background the addition of new traffic has a more onerous net effect (basically the low levels of existing traffic means the net effect of increased traffic has greater impact on the current situation).

In this regard, the outcome of our assessment is that the addition of the proposed development will not result in any significant reduction in traffic capacity arising on the local roads, with all anticipated traffic increases being below the recommended threshold levels above which further assessment is required. This is particularly so in the case of the impact upon the Belgard Road Traffic conditions for example, as evidenced from the Traffic Threshold Assessment included overleaf.
In the case of the subject site, in the context of its former industrial uses, the assessment indicates that the conversion to local residential uses will see a significant improvement in traffic conditions for all transport modes associated with the existing roads in the area.

It should also be noted the local network improvements, removing the existing industrial roads and replacing them with a network of local streets and DMURS compliant junctions, is consistent with the LAP recommendations. These new streets and nodes, will have a very significant and beneficial effect, through the creation of a permeable residential street hierarchy that provides safe and appropriate linkages for all transport modes, with a particular emphasis on pedestrians and cyclists.

We have undertaken the detailed assessment of the traffic impact of the proposed development (Reference ***Appendix C*** of Transportation Assessment Report Appended herewith), and this confirms the Threshold Impact of locally affected junctions as set out below at Table 10.6. In light of this detailed assessment, it can be concluded that the proposed development will not have an adverse impact on the proposed local road network, including junctions.

Relevant Junction	AM Peak (%)	PM Peak (%)	Comment
Internal Estate Junctions	N/A	N/A	ALL Key Junctions Assessed Below
Cookstown Rd/Belgard Rd	4.52%	4.07%	Sub 5% Threshold - No Assessment Reqd
R838/Belgard Rd	1.34%	1.18%	Sub 5% Threshold - No Assessment Reqd
R383/Old Belgard Rd	2.96%	4.77%	Sub 5% Threshold - No Assessment Reqd
Cookstown Rd/Old Belgard Rd	14.3%	16.8%	Exceeds 5% - Junction Assessed

Table 10.6 Threshold Assessment of Junction Impact - TII Guidelines

10.10 Issues Raised in ABP Opinion (Item #2)

As discussed in Chapter 2.0 of the EIAR (more specifically Section 2.4.4) and Section 3.0 of the Statement of Consistency & Planning Report, prepared by Hughes Planning and Development Consultants, extensive consultation with South Dublin County Council and An Bord Pleanala in advancing the application for the subject development. The design and layout of the proposed development was changed and evolved as a result of these consultations. From a transportation perspective, this has included the incorporation of a specific pedestrian/cycle link to the Belgard Luas stop. The changes adopted have ultimately resulted in a high quality, high density, low carbon, highly accessible modern urban residential neighbourhood, specifically connected to high capacity high quality public transport infrastructure.

This Section addresses the specific issues raised within Section 2 of the ABP Opinion dated 29th April 2020, which is reproduced below at Figure 10.3.

> 2. Further consideration of the documentation as it relates to access to the proposed development and to the streets in and around the site. The documentation should demonstrate whether the street network would provide adequate access for pedestrians and other road uses from the proposed development to public transport facilities, places of employment and commercial and social services, having regard to the principles and detailed requirements for urban streets set out in DMURS. In particular the documentation should clarify whether and how any new pedestrian access would be provided to the Luas stop at Belgard and whether and how the existing roads in the industrial estate would be altered to make them suitable to serve urban residential development. If separate cycle facilities are proposed the documentation should demonstrate whether they would comply with the National Cycle Manual and provide proper priority for cyclists over vehicles exiting from minor roads at junctions. The documentation should also provide a rationale for the proposed provision of parking for cars and bicycles.

Figure 10.4 Extract ABP Opinion, Item #2

In terms of ***'The documentation should demonstrate whether the street network would provide adequate access for pedestrians and other road users from the proposed development to public transport facilities, places of employment and commercial and social services, having regard to the principles and detailed requirements for urban streets set out in DMURS'***, the best reference to where this is addressed is within ***Appendix I*** of the enclosed detailed Transportation Assessment Report, and we highlight the following:

- The design of the local replacement streets within the Red Line have been carefully undertaken, so as to be fully consistent with DMURS, and a DMURS 'Statement of Consistency' is included herein as Appendix I of the appended Report,

- The DMURS Statement of Consistency states; - "*The proposed layout strategy seeks to maximise connectivity between key local destinations through the provision of a high level of permeability and legibility for all journeys, particularly for sustainable forms of travel (cycling and walking). The proposed residential scheme delivers greater mode and route choices along direct, attractive and safe linkages to local amenities and schools/service destinations through replacement of the existing industrial estate roads with modern streets"*

- The DMURS Statement of Consistency goes on to state; "*High Quality Connections between the proposed development and the employment areas and facilities within Tallaght, are provided"*

- The Independent Safety Audit included as ***Appendix G*** of the detailed reports included a review of accessibility for cyclists, pedestrians and mobility impaired users and all of the issues raised by the Audit Team are incorporated in the proposed development.

In terms of ***'The documentation should clarify whether and how any new pedestrian access would be provided to the LUAS Stop at Belgard and whether and how the existing roads in the industrial estate would be altered to make them suitable to serve urban residential development'*** we highlight the following: -

- The planning application includes for the construction of a dedicated link to the Belgard LUAS Stop, and a letter of consent from the landowner (in this case Dublin City Council, which is a historic carry-over) has been received and is included as part of the planning application,

- All of the existing industrial estate roads & associated junctions within the red line of the planning application are being replaced with modern residential estate quality links and infrastructure, and **Section 2.11** of the appended detailed Transportation Assessment Report states; -

  There are planned road improvements as part of this application, included as works within the red line, that will improve accessibility and increase local road permeability of the subject sites. The accessibility/permeability will be enhanced for all transport modes, with the removal of the inappropriate infrastructure and the replacement with modern residential-type infrastructure. The proposed altered internal roads will in particular increase accessibility to established public transport services and community facilities. The roadworks included in the application include:-

  - *The replacement & re-construction of Cookstown E-W road, along the northern extremity of the site,*
  - *The replacement & re-construction of Cookstown N-S road, along the western boundary of the site,*
  - *The replacement of 2 traditional Industrial Estate Roundabouts with at grade traffic signal controlled crossings (including pedestrian/cyclists priority within the sequence of the signals),*
  - *The creation of a hight quality pedestrian route and link to the Belgard LUAS,*
  - *New roads and links internally within the site, and*
  - *All roads, footpaths, crossings, cyclists facilities and infrastructure constructed to standards that are consistent with a modern residential area.*

The upgrade works proposed to the existing industrial estate roads and associated junctions are best illustrated in the drawing excerpt included in Figure 10.5 and the photomontages/CGIs included in Figures 10.6 and 10.7, below and overleaf.

Figure 10.5 Excerpt from Drawing No. NRB-TA-001, prepared by NRB Consulting Engineers, included at Appendix A of the Transportation Assessment Report

Figure 10.6 Image, taken by 3D Design Bureau, of the existing junction/roads at the intersection of First Avenue and Cookstown Road

Figure 10.7 Verified view montage, prepared by 3D Design Bureau, of the proposed junction/roads at the intersection of First Avenue and Cookstown Road

- Car parking is being provided significantly below the maximum standards as set out within the South Dublin County Development Plan 2016-2022, with on average an approximate ratio of 0.3 per residential unit, including on-street provision. The lower provision of car parking will act as a demand management measure, ensuring that the development is accessed in the most sustainable manner, being almost predominantly reliant on non-car modes of travel. The lower provision of car parking is supported by a working Mobility Management Plan.

In terms of ***'If separate cyclist facilities are proposed, the documentation should demonstrate whether they would comply with The National Cycle Manual and provide proper priority for cyclists over vehicles existing from minor roads at junctions'*** we highlight the following:

- Proposed Cycle facilities on the Larger Public Roads are compliant with the National Cycle Manual (NCM) (NCM pages 12 & 83), with advance cycle facilities and Toucan type crossings incorporated into all signal controlled junctions. Internally, for the minor streets, the cyclists infrastructure is also consistent with the NCM (NCM Pages 54 & 55).

- Pedestrian and cyclist priority at minor roads, and associated traffic calming, is achieved through the use of raised platforms which afford priority to pedestrians and cyclists.

The cycle infrastructure proposed is best illustrated in the drawing excerpt included in Figure 10.8 overleaf.

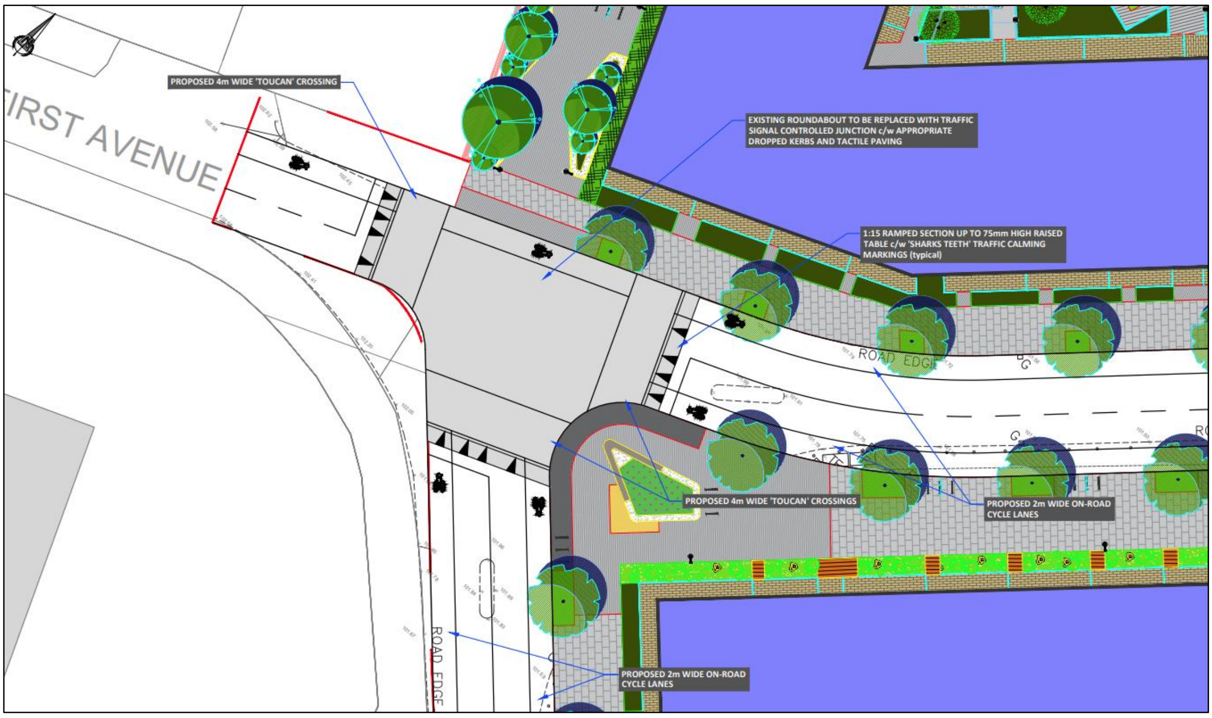


Figure 10.8 Excerpt from Drawing No. NRB-TA-002, prepared by NRB Consulting Engineers, included at Appendix A of the Transportation Assessment Report

In terms of ***'The documentation should also provide a rationale for the proposed provision of parking for cars and bicycles'***, we highlight the following;

- A comprehensive rationale supporting the provision of Bicycle Parking & Car Parking numbers is set out in the detailed Transportation Assessment Report (Paragraph 2.15 to 2.34 inclusive) included at Appendix 10.1. As discussed previously, car parking is being provided significantly below the maximum standards as set out within the South Dublin County Council Development Plan 2016-2022, with on average an approximate ratio of 0.3 per residential unit, including on-street provision. The lower provision of car parking is considered appropriate in this instance given the site immediately abuts the Belgard Luas stop and the site's proximity to a no. of bus services as well existing services and employment providers. The proposed car parking rate is consistent with national planning policy. The application is accompanied by a Preliminary Mobility Management Plan (Travel Plan), prepared by NRB Consulting Engineers (featuring at Appendix H of the Transportation Assessment Report, a copy of which is included at Appendix 10.1). The development is served by 1860 no. bicycle parking spaces (1,464 no. resident bicycle spaces and 396 no. visitor bicycle spaces) which exceeds the requirements set out in the Apartment Guideline and the South Dublin County Development Plan 2016-2022.

10.11 Residual Impacts

The residual impacts are expected to be positive, with increased pedestrian and cyclist activity, with an increased demand for public & alternative transport created through establishing a vibrant sustainable residential community, consistent with the Local Area Plan.

WATER SUPPLY & DRAINAGE

10.12 Introduction

This chapter of the EIAR comprises of an assessment of the likely impact of the proposed development on existing surface water, water supply and foul drainage, in the vicinity of the site as well as identifying proposed mitigation measure to minimize any impacts. The material assets considered in this chapter of the EIAR include Surface Water Drainage, Foul Drainage and Water Supply.

The proposed development is a mixed use retail and residential scheme on a site with overall area of 4.99 hectares approximately at Cookstown Industrial Estate, Dublin 24. The site is situated approximately 750m northeast of Tallaght Hospital and 1.1km north of the Whitestown Stream.

The author of this Chapter is Greg Daly (FConsEI BScEng CEng MIEI MIStructE MCIArb MBA) of GDCL Consulting Engineers - a Chartered Professional Engineer with over 35 years' experience in the design and construction of civil engineering projects, including developments associated with residential, commercial, industrial and public infrastructure sectors.

A full Engineering Services Report, has been prepared by GDCL Consulting Engineers and accompanies this planning application. This report and the discussion included in Section 2.3 of the Statement of Response to Pre-application Consultation Opinion, prepared by Hughes Planning and Development Consultants and the appended letter, prepared by GDCL Consulting Engineers, illustrates how the drainage and water supply issues raised in the submissions from South Dublin County Council and Irish Water have been addressed and satisfies Item #3 of the specific information requested by to An Bord Pleanála.

10.13 Research Methodology

As part of assessing the likely impact of the proposed development, surface water runoff, foul drainage discharge and water usage calculations were carried out in accordance with the following guidelines:

- Greater Dublin Strategic Drainage Study (GDSDS).
- Method outlined in Irish Water's Code of Practice for Wastewater Infrastructure.
- Method outlined in Irish Water's Code of Practice for Water Infrastructure.

Assessment of the likely impact of the proposed development on existing material assets in the vicinity of the site included:

- Review of Irish Water utility plans (surface water and foul drainage and water supply)
- Consultation with South Dublin County Council.
- Consultation with Irish Water including the normal process of submitting a Pre-Connection Enquiry Application - arising out which Irish water have confirmed feasibility and acceptance of the proposed drainage and water services design by their issuance of the following:
    - i. Irish Water Confirmation of Feasibility Letter
    - ii. Irish Water Statement of Design Acceptance
    - iii. Irish Water Foul Diversion Confirmation of Feasibility Letter

10.14 Receiving Environment

10.14.1 Surface Water Drainage

The nearest EPA designated watercourse is a tributary of the River Dodder, referred to as "Whitestown Stream", which is located some 1.1km to the south edge of the site. Two existing 300mm & 450mm diameter surface water drainage lines traverse the site.

The topographical survey indicates that the site has a moderate fall from west to east. The two existing surface water sewers will provide a suitable surface water discharge point for the proposed development.

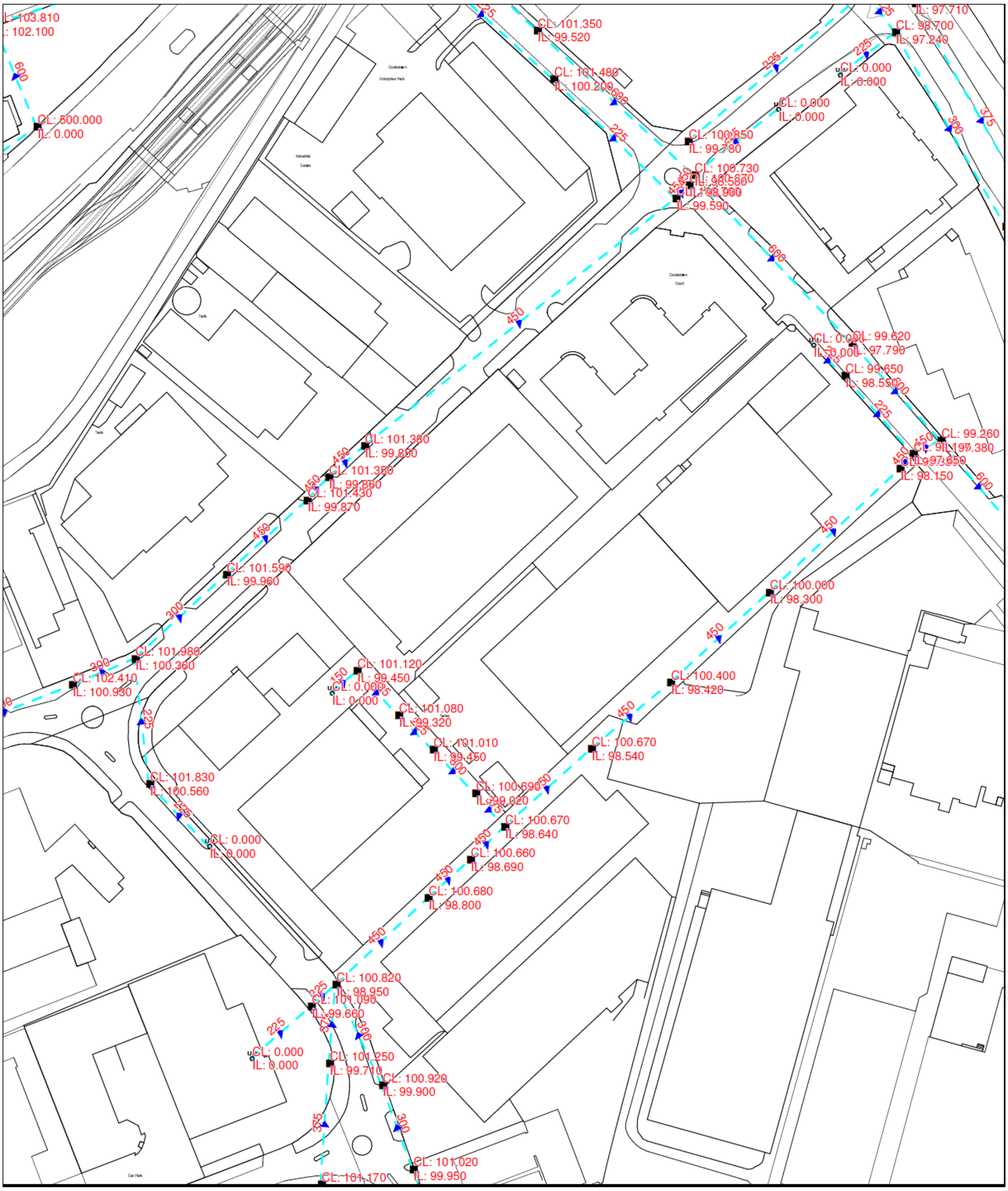


Figure 10.5 Map Extract from Irish Water Existing SW Drainage Plan

10.14.2 Foul Drainage

Irish Water records indicate the location of existing foul water drainage services in the vicinity of the site. The subject site is currently brownfield, dominated by wharehouse type units and therefore is notional foul loading at present.

There is currently am existing 300mm and 450mm diameter foul sewer falling in an easterly direction and an existing 300mm diameter foul sewer falling from north to south. These foul drainage lines currently service the existing warehouses.

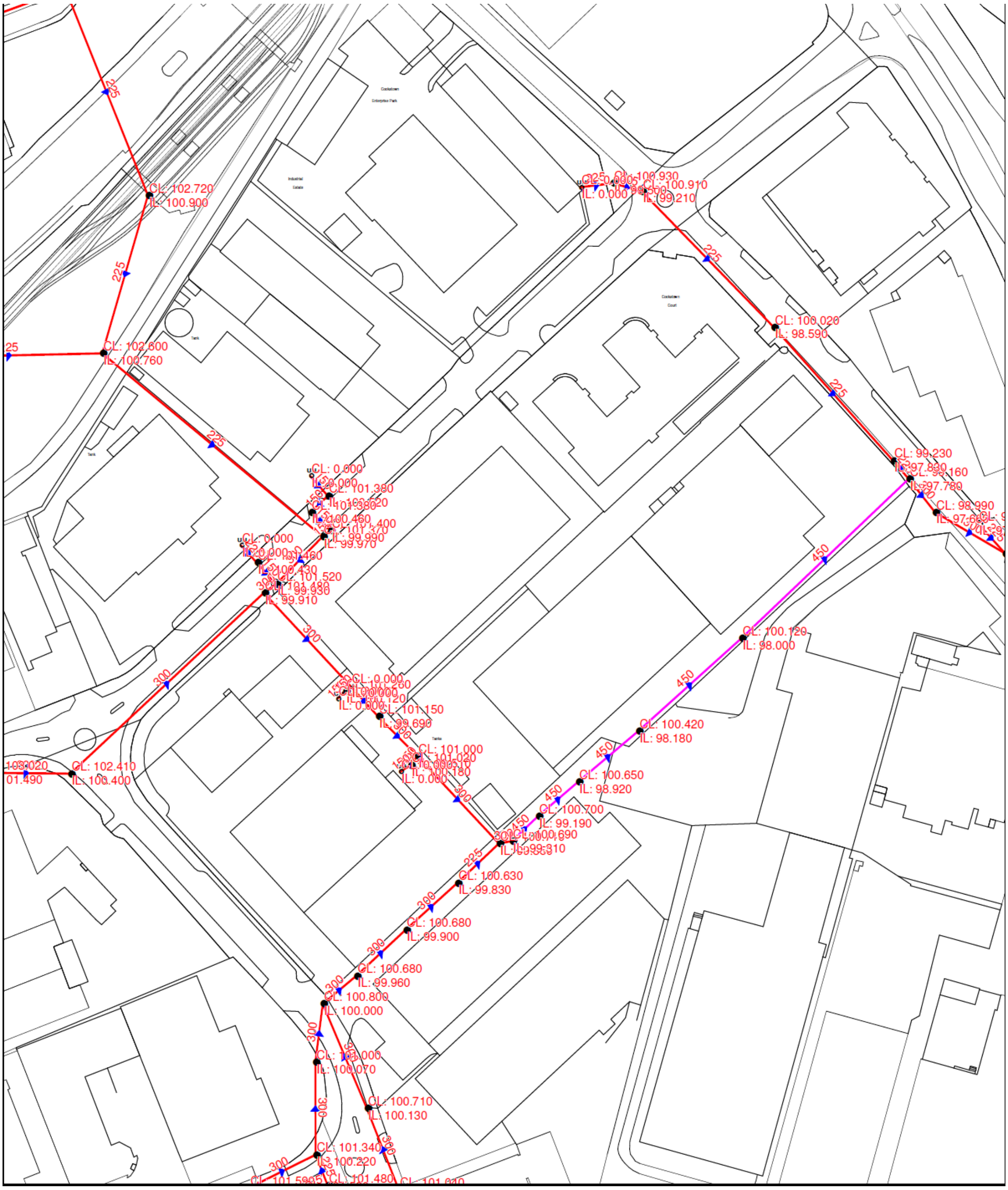


Figure 10.6 Map Extract from Irish Water Existing Foul Drainage Plan

10.14.3 Water Supply

Irish Water records indicate the location of existing public watermains services in the vicinity of the site. An existing 100mm diameter public watermain runs along the Cookstown Estate Road which runs within the footprint of the proposed site. A 150mm diameter public watermain is located at the eastern boundary of the site.

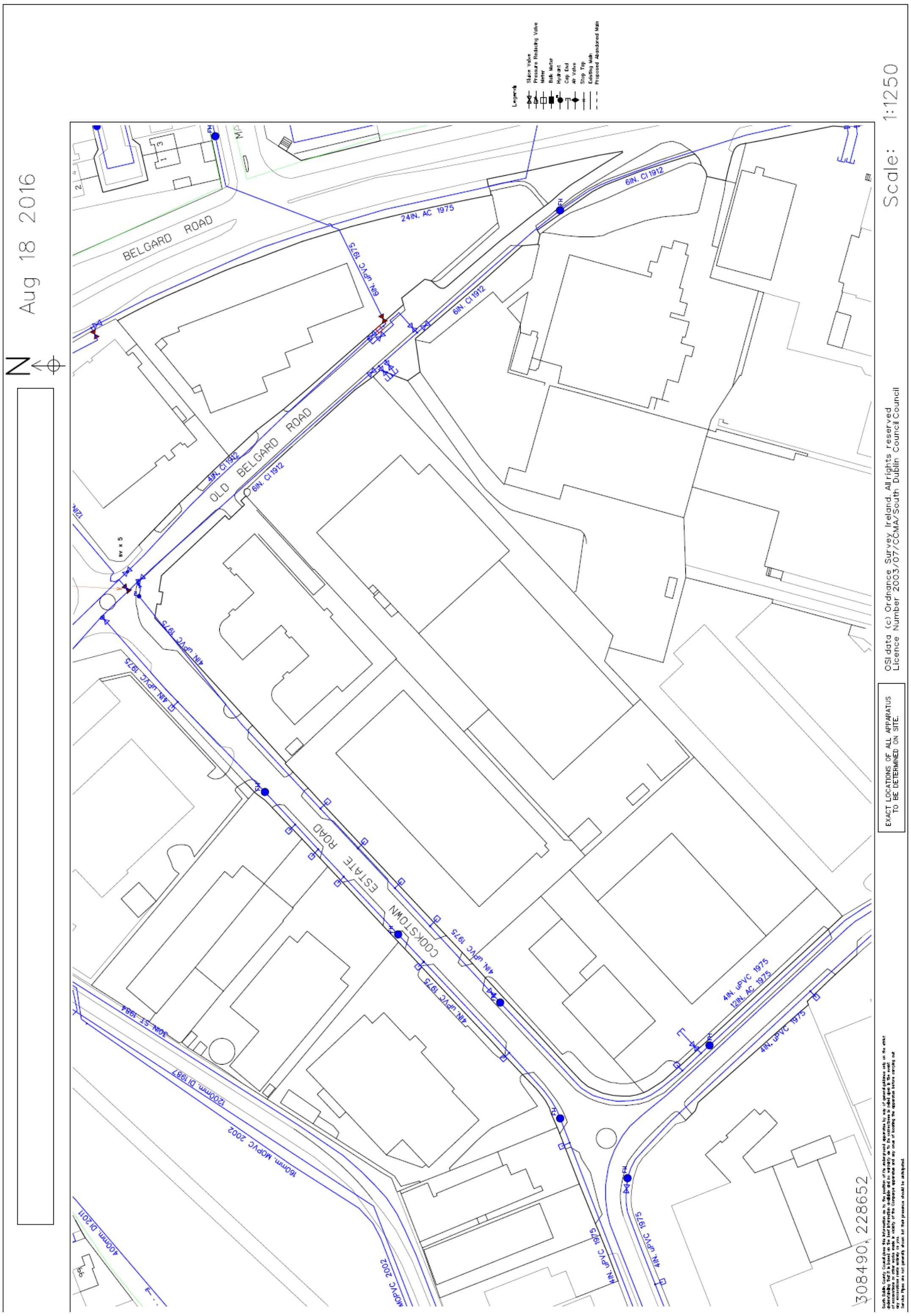


Figure 10.7 Map Extract from Irish Water Existing Water Supply Plan

10.15 Characteristics of the Proposed Development

10.15.1 Surface Water Drainage

The existing surface water network is expected to provide a suitable discharge source for the proposed surface water network within the proposed development. The proposed surface water network for the proposed development has been designed as four separate catchments. Each of the proposed catchments with be attenuated in separate infiltration detention facilities before discharging to the aforementioned existing surface water network.

The calculated allowable surface water runoff for the entire development has been calculated as 8.4 l/s in accordance with Greater Dublin Strategic Drainage Study (GDSDS). The individual attenuation requirement for each of the proposed surface water catchments has been separately assessed. The discharge rates for these catchments will controlled by a flow control device (typically Hydrobrake) and the appropriately sized attenuation facility. Each of the proposed attenuation facilities will be sized to accommodate the 100 year storm event.

Prior to discharging to the existing surface water network, surface water flows will pass through a Class 1 petrol interceptor. Proposed surface water drains have been designed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS), the Department of the Environment's Recommendations for Site Development Works for Housing Areas, the Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Waste Water Disposal" and BS EN 752: 2008 Drain and Sewer Systems Outside Buildings.

Surface water calculations are based on an allowable outflow / greenfield runoff rate of 2.1 l/sec/ha resulting in a total attenuation volume of 2284m³. The proposed surface water drainage network will collect surface water runoff from the site via a piped network prior to discharging to the existing surface water drainage network via the attenuation facility flow control device and separator arrangement on each network as noted above.

Surface water runoff from the site's road network will be directed to the proposed pipe network via conventional road gullies. Surface water runoff from traditional roof systems will be routed to the proposed surface pipe network via conventional downpipes.

Surface water runoff from green roof systems will be routed to the proposed surface pipe network via an extensive substrate layer (typically 100mm deep), laid on a filter layer, water retention and drainage layer, and then routed to the proposed surface pipe network via conventional downpipes.

10.15.2 Foul Drainage

The proposed foul drainage system will be completely separate from the surface water system and will comprise a network of 225 mm diameter pipelines. The proposed foul drainage system for the entire site has been designed as one catchment, discharging to the existing 225mm diameter foul sewer located at Airton Road

Each block will be connected to the proposed 225mm diameter foul drainage system via individual 225mm pipe connections as per Irish Water Code of Practice for Wastewater Infrastructure. The existing 300mm diameter foul sewer in running in a southerly direction from Cookstown road to the existing 450mm diameter foul sewer located within the existing access lane south of the existing warehouse will be diverted. It is proposed to relocate this foul sewer under the proposed roadway and tie back into the existing 450mm diameter foul sewer located within the existing access lane.

The foul drainage network for the proposed development has been designed in accordance with the Building Regulations and specifically in accordance with the principles and methods as set out in the Irish Water Code of Practice, IS EN752 (2008), IS EN12056: Part 2 (2000) and the recommendations of the 'Greater Dublin Strategic Drainage Study (GDSDS)'.

A daily foul discharge volume for the proposed development of 508m³ has been calculated as outlined in Irish Water's Code of Practice for Wastewater Infrastructure.

As previously referenced, extensive consultation has taken place with Irish Water including - arising out which Irish water have confirmed feasibility and acceptance of the proposed drainage and water services design by issuance of the following:

i. Irish Water Confirmation of Feasibility Letter
ii. Irish Water Statement of Design Acceptance

iii. Irish Water Foul Diversion Confirmation of Feasibility Letter

10.15.3 Water Supply

An existing 100mm diameter public watermain runs along the Cookstown Estate Road which runs within the footprint of the proposed site. A 150mm diameter public watermain is located at the eastern boundary of the site.

Two connections will be made to the existing watermain located within the Cookstown Estate Road watermain at the proposed eastern access to the site. A 150mm diameter (nominal bore) ring watermains will be provided along outer access roads within the site, with a number of 100mm diameter looped branch watermains provided internally to service the individual blocks.

All connections, valves, hydrants, meters etc. have been designed and are to be installed in accordance with Irish Water's Code of Practice / Standard Details.

An average daily demand for the proposed development of approximately 451m³ and an average day / peak week demand of 563m³ has been calculated as outlined in the Irish Water Code of Practice for Water Infrastructure.

As previously referenced, extensive consultation has taken place with Irish Water including - arising out which Irish water have confirmed feasibility and acceptance of the proposed drainage and water services design by issuance of the following:

i. Irish Water Confirmation of Feasibility Letter
ii. Irish Water Statement of Design Acceptance

10.16 Potential Impact of The Proposed Development

10.16.1 Construction Phase

Potential impacts that may arise during the construction phase are noted below:

- Contamination of surface water runoff due to construction activities
- Improper discharge of foul drainage from contractor's compound
- Cross contamination of potable water supply to construction compound
- Damage to existing underground and over ground infrastructure and possible contamination of the existing systems with construction related materials.
- Relocation or diversions to existing overhead ESB lines may lead to loss of connectivity to and / or interruption of supply from the electrical grid.
- Potential loss of connection to the Gas Networks Ireland and Telecommunications infrastructure while carrying out works to provide service connections

10.16.2 Operational Phase Construction Phase

Potential operational phase impacts are noted below:

- Increased impermeable surface area will reduce local groundwater recharge and potentially increase surface water runoff (if not attenuated to greenfield runoff rate).
- Accidental hydrocarbon leaks and subsequent discharge into piped surface water drainage network (e.g. along roads and in driveway areas).
- Increased discharge to foul drainage network (Daily Foul Discharge Volume = 508 m³)
- Increased potable water consumption (Average Day / Peak Week Demand = 451 m³)

10.16.3 Do Nothing Scenario

There are no predicted impacts should the proposed development not proceed.

10.17 Mitigation and Remedial Measures

10.17.1 Construction Phase

A site-specific Construction and Waste Management Plan implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the Construction and Waste Management Plan.

Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.

The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be tinkered off site to a licensed facility until a connection to the public foul drainage network has been established.

The construction compound's potable water supply shall be located where it is protected from contamination by any construction activities or materials.

Connections to the existing gas and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.

10.17.2 Operational Phase

Refer to Chapter 7.0 - Water and Hydrology for mitigation measures associated with the surface water treatment.

All new foul drainage lines will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational.

No specific mitigation measures are proposed in relation to water supply, however water conservation measures such as dual flush below water cisterns and low flow taps will be included in the design.

10.17.3 Do Nothing Scenario

No mitigation measures are proposed in relation to water and the hydrological environment if the development does not proceed.

10.18 Predicted Impact of the Proposed Development

10.18.1 Construction Phase

Implementation of the measures outlined will ensure that the potential impacts of the proposed development on the site's material assets do not occur during the construction phase and that any residual impacts will be short term.

10.18.2 Operational Phase

The overall foul volume discharging to the existing foul network will increase due to the construction of the proposed development. However, As previously referenced, extensive consultation has taken place with Irish Water including - arising out which Irish water have confirmed feasibility and acceptance of the proposed drainage and water services design by issuance of the following:

i. Irish Water Confirmation of Feasibility Letter
ii. Irish Water Statement of Design Acceptance

Therefore, no cumulative impacts are anticipated in relation to foul drainage.

Implementation of the measures outlined will ensure that the potential impacts of the proposed development on the site's material assets do not occur during the construction phase and that any residual impacts will be short term.

10.18.3 Do Nothing Scenario

There are no predicted impacts should the proposed development not proceed.

10.19 Monitoring

Refer to Chapter 7.0 - Water and Hydrology for the proposed monitoring in relation to the surface water.

No specific monitoring is proposed in relation to the remaining material assets infrastructure.

10.20 Reinstatement

Reinstatement of any excavations relating to the provision of surface and foul drainage connections is to be carried out in accordance with the relevant asset provider's requirements and the requirements of South Dublin County Council.

10.21 Interactions and Potential Cumulative Impacts

10.21.1 Interactions

Soils and Geology

i. Trench excavations to facilitate site service installation will result in exposure of subsoils to potential erosion and subsequent sediment generation.

10.21.2 Potential Cumulative Impacts

The proposed surface water drainage infrastructure has been designed in accordance with the relevant guidelines. Any other future development in the vicinity of the site would have to be similarly designed in relation to permitted surface water discharge, surface water attenuation and SuDS, therefore, no potential cumulative impacts are anticipated in relation to surface water drainage and flooding.

Potential cumulative impacts have been assessed in relation to connecting the development to the existing foul drainage network. However, As previously referenced, extensive consultation has taken place with Irish Water including - arising out which Irish water have confirmed feasibility and acceptance of the proposed drainage and water services design by issuance of the following:

i. Irish Water Confirmation of Feasibility Letter
ii. Irish Water Statement of Design Acceptance

No potential cumulative impacts are anticipated in relation to water supply, and subject to Irish Water feedback regarding the feasibility the provision of a water without infrastructure upgrade.

Should any other developments be under construction or planned in the vicinity of the site they are likely to have similar impacts during the construction phase in relation to Material Assets. Should the construction phase of any developments coincide with the development of this proposed site, potential cumulative impacts are not anticipated once similar mitigation measures are implemented.

11.0 ARCHAEOLOGY, ARCHITECTURAL AND CULTURAL HERITAGE

11.1 Introduction

The proposed development comprises of a brownfield site in two segments either side of the Cookstown Estate Road and along the Old Belgard Road in the northeast of the Cookstown Industrial Estate. The site is currently occupied by existing commercial buildings and hard surfaces.

This chapter of the Environmental Impact Assessment Report has been prepared by Dr. Yolande O' Brien, Archaeological Planning Consultant at Courtney Deery Heritage Consultancy Ltd. Dr. O' Brien holds a PhD in Archaeology (National University of Ireland, Galway), MA in Landscape Archaeology (National University of Ireland, Galway) and a BA in Archaeology and Classical Civilisation (National University of Ireland, Galway). She has eleven years of archaeological experience in a variety of contexts involving research, teaching, survey, excavation and the production of archaeological reports and mapping.

This chapter provides an assessment of the archaeological, architectural and cultural heritage background for a residential development at a site located on the Cookstown Estate Road, Cookstown Industrial Estate, Dublin 24.

There are no recorded archaeological (RMP) sites or features of architectural merit located within the proposed development site. There are no visible cultural heritage features within the development site, but a small portion of the Tallaght / Cookstown townland boundary is located within the site and historic mapping depicts a former roadway within the application lands. Twentieth century development has destroyed any visible trace of these features, but it is possible that subsurface evidence of these features may be preserved beneath modern surfaces and / or under a possibly undisturbed strip of grass.

The objective of the chapter is to assess the impact of the proposed development on the receiving archaeological, architectural and cultural heritage environment and to propose ameliorative measures to safeguard any monuments, features, finds of antiquity or features of archaeological or cultural heritage merit.

11.2 Research Methodology

11.2.1 Desk Study

This report was based on an examination of published and unpublished documentary and cartographic sources. The following sources were consulted in the course of the study.

- The National Monuments, Preservation Orders and Register of Historic Monuments lists were sourced directly from the Department of Culture, Heritage and the Gaeltacht (DCHG);
- *Record of Monuments and Places (RMP) and Sites and Monuments Record (SMR)*: The primary source of information for the desk study is the Record of Monuments and Places (RMP) of the Department of Culture, Heritage and the Gaeltacht (DCHG). The Sites and Monuments Record (SMR), as revised in the light of fieldwork, formed the basis for the establishment of the statutory RMP pursuant to Section 12 of the National Monuments (Amendment) Act, 1994. The RMP records known upstanding archaeological monuments, their original location (in cases of destroyed monuments) and the position of possible sites identified as cropmarks on vertical aerial photographs. It is based on a comprehensive range of published and publicly available documentary and cartographic sources. The information held in the RMP files is read in conjunction with published constraint maps. Archaeological sites identified since 1994 have been added to the non-statutory SMR database of the Archaeological Survey of Ireland (National Monuments Service, DCHG), which is available online at www.archaeology.ie and includes both RMP and SMR sites. Those sites designated as SMR sites have not yet been added to the statutory record, but are scheduled for inclusion in the next revision of the RMP;
- *National Museum of Ireland (NMI) Topographical Files*: The topographical files of the National Museum of Ireland (NMI) identify recorded stray finds held in the museum's archive. The files, which

are donated to the state in accordance with national monuments legislation, are provenanced to townland and sometimes include reports on excavations undertaken by NMI archaeologists earlier in the 20th century;

- *Record of Protected Structures (RPS) and Architectural Conservation Areas (ACAs), South Dublin County Development Plan (2016-2022):* The current South Dublin County Development Plan was consulted for a list of protected structures, the Record of Protected Structure (RPS sites), comprising schedules of buildings and items of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest that are listed for protection in the study area. An architectural conservation area (ACA) is a place, area, group of structures or townscape, taking account of building lines and heights, that is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or that contributes to the appreciation of a protected structure, and whose character it is an objective of a development plan to preserve;
- *National Inventory of Architectural Heritage*: The National Inventory of Architectural Heritage (NIAH) was established in 1990 in order to fulfil Ireland's obligations under the Granada Convention which states that '*for the purpose of precise identification of the monuments, groups of buildings and sites to be protected, each Party undertakes to maintain inventories of that architectural heritage*'. The survey of Fingal was carried out in 2002; this building survey highlights a representative sample, and raises awareness of the wealth of architectural heritage in the county. The NIAH surveys can be reviewed at www.buildingsofireland.ie;
- *Excavation Bulletins and Dublin Archaeology Data Viewer*: The 'Excavations' bulletin published by Wordwell and on the website www.excavations.ie, was consulted for any previous relevant archaeological surveys and excavations that have taken place on or in the vicinity of the proposed development. The 'County Dublin Archaeology Data viewer' also provides excavation information for County Dublin in the form of a webGIS in which archaeological excavations are mapped with excavation reports provided. It is available at www.heritagemaps.ie;
- Cartographical sources included William Petty's Down Survey parish and baronial maps, c.1656; John Rocque's map of the county of Dublin 1760; John Taylor's Map of the Environs of Dublin, 1816; Ordnance Survey (OS) six-inch maps, 1843, 1871, 1907-9 and 1935-8; and Ordnance Survey (OS) 25-inch map 1906-9;
- Additional documentary and literary references consulted are listed in the bibliography; and
- Aerial imagery (Google Earth 2001–2020, Bing 2013; OSI 1995, 2000, 2006, 2011-2013, 2017).

11.2.2 Standards and Guidelines

The following legislation, standards and guidelines were consulted to inform the assessment:

- National Monuments (Amendments) Acts, 1930-2014;
- The Planning and Development Act 2000, as amended;
- Heritage Act, 1995;
- The UNESCO World Heritage Convention, 1972;
- ICOMOS Xi'an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas, 2005;
- Council of Europe Convention for the Protection of the Architectural Heritage of Europe (Granada) 1985, ratified by Ireland in 1991;
- Council of Europe European Convention on the Protection of the Archaeological Heritage (Valletta) 1992, ratified by Ireland in 1997;
- The Burra Charter, the Australia ICOMOS Charter for Places of Cultural Significance 2013;
- The European Landscape Convention (ELC), ratified by Ireland 2002 European Landscapes Convention 2010. (The Department of the Environment, Heritage and Local Government 'Landscape and Landscape Assessment Guidelines' have been in draft form since 2000, however the Draft National Landscape Strategy (NLS) was launched in July 2014);
- Guidance on Heritage Impact Assessments for Cultural World Heritage Properties – A publication of the International Council on Monuments and Sites, January 2011;
- Guidelines on the information to be contained in Environmental Impact Statements, 2002, EPA;
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements), 2003, EPA;

- EPA: Draft Revised Guidelines on The Information to be Contained in Environmental Impact Assessment Reports, August 2017;
- EPA: Advice Notes for Preparing Environmental Impact Statements, Draft, September 2015;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht and Islands;
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Planning and Development Act 2000;
- Code of Practice between the National Roads Authority (NRA) and the Minister for Arts, Heritage and the Gaeltacht, June 2000;
- Guidelines for the Assessment of Architectural Heritage Impact of National Road Schemes, 2006, NRA;
- Guidelines for the Assessment of Archaeological Heritage Impact of National Road Schemes, 2006, NRA;
- Guidelines for the Testing and Mitigation of the Wetland Archaeological Heritage for National Road Schemes, 2006, NRA; and
- National Landscape Strategy for Ireland 2015-2025, Department of Arts, Heritage and the Gaeltacht.
- Historic England (July 2015), Historic Environment Good Practice Advice in Planning, Note 3: The Setting of Heritage Assets;
- Historic Scotland (October 2010), Managing Change in the Historic Environment;
- The Heritage Council (2010), Proposals for Irelands Landscapes; and International Council on Monuments and Sites (2011), Guidance on Heritage Impact Assessments for Cultural World Heritage Properties.

Excerpts from the relevant legislation are contained in Appendix 11.1 of this chapter.

11.2.3 Rating of Impacts

Cultural heritage sites / landscapes are considered to be a non-renewable resource and cultural heritage material assets are generally considered to be location sensitive. In this context, any change to their environment, such as construction activity and ground disturbance works, could adversely affect these sites. The likely significance of all impacts is determined in consideration of the magnitude of the impact and the baseline rating upon which the impact has an effect (i.e. the sensitivity or value of the cultural heritage asset). Having assessed the magnitude of impact with respect to the sensitivity/value of the asset, the overall significance of the impact is then classified as imperceptible, slight, moderate, significant, or profound. A glossary of impact assessment terms, including the criteria for the assessment of impact significance, is contained in Appendix 11.2 of this chapter.

In accordance with the NRA 'Guidelines for the Assessment of Archaeological Heritage Impact of National Road Schemes' (2006) the significance (i.e. value) criteria used to evaluate an archaeological site, monument or complex are as follows: existing status (level of protection), condition or preservation, documentation or historical significance, group value, rarity, visibility in the landscape, fragility or vulnerability, and amenity value. The archaeological and cultural heritage environment is assigned a baseline rating, taking into account the importance, value and / or sensitivity of the receiving environment (Cf. Table 3, Appendix 11.2).

11.3 Receiving Environment

11.3.1 Site Location and Context

The site lies within the townlands of Tallaght and Cookstown, in the parish of Tallaght and the barony of Uppercross. It is located within the Cookstown industrial estate. The lands are composed of two segments of brownfield sites on the north and south sides of the Cookstown Estate Road in the northeast of the Cookstown Industrial Estate. It is currently occupied by existing buildings and hard surface parking. The surrounding area is heavily developed with buildings and roads related to the industrial estate to the south, while the residential areas of Belgard, Kingswood and Kilnamanagh are located to the north and east across the Cookstown Road and the Belgard Road (R113). The Red LUAS line runs along the Cookstown Road, to the north of the proposed development site.

Figure 11.1 Site location

11.3.2 Archaeological and Historical Background

Prehistoric Period

Tallaght is situated in the foothills of the Dublin Mountains. These uplands contain a wealth of prehistoric monuments that include the passage tombs on Montpelier and Saggart Hills, the standing stones at Boherboy (near Saggart), and the tumuli and barrows at Crooksling, Mountseskin, Slievethoul and Verschoyle's Hill. The lower foothills around Tallaght itself are particularly rich in Early Bronze Age remains and include two substantial Early Bronze Age cemeteries at Greenhills and Kiltalown (Waddell 1990), both of which were discovered in the 19th century and neither of which have exact locations. The townland name, Tallaght, is derived from *támh leacht* meaning 'plague burial'. This name, said by medieval documentary sources to refer to the pseudo-historical Parthalonians, may refer to a tradition of medieval burials or instead to the many prehistoric burials that have been found in the vicinity (Bradley 1998).

There are no archaeological sites of a prehistoric date recorded within the immediate vicinity of the proposed development lands; however stray finds recorded for Tallaght townland include a polished stone axehead of probable Neolithic date (NMI ref. 1934:466), indicating activity in the area during this time.

Evidence for the Bronze Age in this area is represented by a range of artefacts, including several axes. The earliest are four flat copper axeheads (Lough Ravel or Knocknague type) from Tallaght townland (NMI refs. 1955:24–27). These were discovered in a sandpit close to the bank of the River Dodder, which was being cleared by Dublin Concrete Block Company. The axes were said to have appeared in pairs a yard or so apart at the same elevation in the sand, their relative proximity possibly indicating that they were deposited as a votive hoard. The axes are very early and probably predate the invention or introduction of the bronze alloy to Ireland.

The Middle Bronze Age is represented by another small hoard, this one containing a bronze palstave (a type of flanged axe) and a small bronze cup or bowl (NMI refs. 1973:213; 1973:214), found in a garden of the Bancroft Estate. As noted above, there are also several Bronze Age burials in the vicinity, including cemeteries at Kiltalown and Greenhills. The sherds of pottery recovered from Kiltalown include both urn and Bowl Food Vessel types (NMI refs. 556D, W10, WR93 and 557D, W10a, WR94) (Lenteigne 1847–50, 187–88; Waddell 1990). The Greenhills cemetery produced Vase and Bowl Food Vessels and Vase or Encrusted Urns accompanying both cremations and inhumations (NMI refs. 1892:48, 1898:18–20, 1909:24, 1945:373, Wk161).

There is evidence in the vicinity of the study area for activity during the Iron Age (c. 500 BC–AD 500). An archaeological complex at Ballymount Great (DU021-015, c. 1.8km northeast of the proposed development lands), was excavated prior to the construction of the Western Parkway (M50) motorway (Stout 1982). The earliest feature was a large oval enclosure, which originally had an outer earthen bank and inner fosse. The absence of a defensive external fosse and the presence of an internal quarry ditch suggest a ritual purpose for the site. It was posited that the site was closely related to the barrow tradition and on the basis of comparative archaeology, a tentative early Iron Age date was proposed (Stout 1982). Subsequent excavations in advance of the nearby LUAS scheme took place from 1997 to 2000, revealing features from the Bronze Age through to the medieval period.

Early Medieval Period

A range of sites in the proposed development environs, few of which survive on the ground, represents the early medieval period (c. AD-500–1100). Ringforts and other possible enclosures are noted in the wider area, for example at Belgard (RMP no.: DU021-025) c.1.3km northwest. The ringfort, otherwise known as a rath or fairy fort, is the best-known native monument of this period, although they are rare in Dublin (largely a result of intensive agriculture and development). Consisting of circular areas defined by banks and external ditches, the ringfort was a defended homestead that would have enclosed the house and farm buildings of a single extended family. They are also the secular equivalents of the ecclesiastical foundations that developed with the onset of Christianity in Ireland in the 5th century.

Despite the scarcity of secular sites in the record, the presence of two important monastic foundations in the area is indicative of settlement and activity at this time, with one at Tallaght (RMP no.: DU021-037, 1km to the southeast) and another further north at Clondalkin (RMP no.: DU017-041, c. 3km north). The possible location of a third, small monastic foundation is recorded at Kilnamanagh, c. 1.2km northeast (RMP no.: DU022-005).

The early ecclesiastical site at Tallaght (RMP no.: DU021-037) was one of the most prestigious centres of religion and learning in early medieval Ireland. It was founded in AD 769 by St Máel Ruain and had considerable estates in the vicinity (Gwynn & Hadcock 1988). It became a possession of the archdiocese, and, after the English invasion, was one of the Archbishop’s principal manors. When, in 1179, St Lorcán O’Toole was given a confirmation by the Pope of the diocesan lands, Tallaght came close to heading the list, preceded only by Lusk, Swords, Finglas and Clondalkin.

The present remains of the monastic foundation at Tallaght include two church towers and a cross, although the market cross appears to have been removed and re-used in the construction of a bath house by the archbishop of Dublin in the late 18th century. There is evidence of the original curvilinear ecclesiastical enclosure (RMP no.: DU021-037002) and there are also references to an archbishop’s palace from the 14th century onwards; a tower now incorporated into the Dominican Priory was part of this palace. Two bullaun stones in the priory garden are also remnants of the earlier Christian foundation. The present St Mael Ruain’s church (built in 1829) incorporates the four-storey west tower of the earlier medieval church and contains a granite basin and a simple Latin cross (RMP no.: DU021-037009; Bradley & King 1989).

Viking raids on the Irish coastline also commenced during this period and, before long, prominent ecclesiastical centres, such as Clondalkin, were plundered and burned (in 834 AD). In 841-2 the Vikings wintered for the first time at Dublin. By 853 the settlement had assumed something of a permanent aspect with the arrival of a Scandinavian dynast known as Olaf the White. It appears that satellite settlements were established around the main longphort on the River Liffey, and the record states that Olaf had a fortress near Clondalkin, which was destroyed by the Irish in 867. A cemetery site in Corkagh Demesne, uncovered during excavations on the Saggart, Rathcoole and Newcastle Drainage Scheme yielded burials, including one with two ring pins of Viking age although not necessarily of Viking origin.

Medieval Period

Evidence of later settlement is represented by a tower house, a small, fortified residence of the gentry in the 14th to 16th centuries in Belgard (RMP no.: DU021-026, c. 1km northwest). Some castles and tower houses also had bawns, large defensive enclosures attached to or enclosing the castle. According to Ua Broin (JRSAI, 1944, 200), there was an arched gateway which incorporated a date stone of 1577 (RMP no.: DU021-014), leading lead off the old Belgard Road into Newlands House. The demesne at Newlands was not laid out until the late 17th century, although the presence of the gateway suggests that there was a house here from at least the later 16th century (this gateway was removed when the New Belgard Road was constructed in 1983).

The area that now forms County Dublin south of the Liffey, including the baronies of Uppercross and Newcastle, remained under the control of Leinster rulers until the arrival of the Anglo-Normans in the late 12th century. Prior to that, early dynasties of the Laigin were well represented in the region. Dál Messin Corb was originally based at Naas (Byrne, 1973) and had ecclesiastical interests in Newcastle and Uppercross, as indeed had Uí Bairrche; lineages of both dynasties were represented at Clondalkin, Saggart and Kilnamanagh (MacShamhráin 1996).

The early ecclesiastical site of Tallaght was one of the most prestigious centres of religion and learning in early medieval Ireland. Tallaght was founded in 769 by St Máel Ruain, and although it had long been a centre of reform in the Irish church, it was not without considerable estates in the vicinity. It became a possession of the archdiocese, and after the English invasion, was one of the Archbishop’s principal manors. When, in 1179, St Lorcán O’Toole was given a confirmation by the Pope, of the diocesan lands, Tallaght came close to heading the list, preceded only by Lusk, Swords, Finglas and Clondalkin.

The first mention of the manor of Tallaght comes during the episcopacy of Henry de London (1213-28), who granted 67 acres ‘held in the manor of Tanelaughe’, which had previously been held by a native Irishman, Padinus Okenlisse, to an Englishman called Allan de Mohand. The first proper surviving extent of the manor of Tallaght was compiled in 1326, by which time it was already in decline. Though the lands were assessed at a considerable rent in time of peace, it was stated that they were worth ‘nothing in war, because close to the Irish’.

The Talbots of neighbouring Belgard were a significant secular landowning dynasty. They were a cadet branch of the lords of Malahide. With their caput at Belgard, by the end of the 15th century they became the most prominent lay landholder in the area when Robert Talbot, son of John Talbot of Feltrim, purchased Killinardan, Ballymaice, Ballinascorney and 'Fyngower' from the FitzWilliam family, lords of Merrion, and also tenants of Jobstown. By 1525, Robert Talbot of Belgard held not only these lands, but 'Corbally, Salisboan, Ballymergy, Kingswood near Saggart, Killinardan, 'Fyngon', Byrragh and 16 acres near Ballymaice'.

The Talbot castle at Belgard (RMP no.: DU021-026), built on lands belonging to the See of Dublin, stood, like Tallaght castle, close to the barrier of the Pale. The lands at Kilnamanagh, to the east of Belgard, was the site of an early religious house, founded by Eogain of Ardstraw, which came into the possession of the Belgard family sometime before the death of Robert Talbot in 1523. Subsequently they appear to have reverted to the Crown. Part of the reason for these townlands being alienated from the Crown and from the royal manor of Saggart, is that the latter suffered much from the resurgent activity of the native Irish based in the foothills of the Dublin and Wicklow mountains. By the 15th century, the area was on the frontiers of the Pale, subject to hostile assault, and yielding no profit to the Crown. As a result, large areas of royal land were leased to powerful local landholders who could, by their presence, maintain some level of governmental control. In addition, as an Old English Catholic family, the Talbots of Belgard suffered forfeitures of land in the confiscations and regrants that followed in the 16th and 17th centuries.

Post-Medieval Period

The village of Tallaght is described by Lewis in the early 19th century as containing a dispensary and constabulary police station, where petty sessions were held every other week. He also notes that although it had a patent for fairs, these were not held, which might indicate that the village was less populated or prosperous in this period. Lewis records several paper and flour mills, as well as a woollen mill in the parish, while the first edition OS map shows a corn mill on the southeast side of the village. The area surrounding the village during the post-medieval period was predominantly rural, with some small country houses or villas located in the vicinity. These include Newhall Cottage, Fettercairn House, Jobstown House, Kilnamanagh House, with the extensive Newlands Demesne and Belgard Castle dominating the landscape further north.

It was during this period that the present St Maelruan's Church (NIAH no.: 11215004; RPS no.: 271) was constructed, replacing the earlier structure on the site. According to Lewis, the building was funded '*by a grant of nearly £3000 from the Board of First Fruits; it is in the pointed style of architecture, with pinnacles at the angles and along the sides: the ancient belfry tower, which is of considerable height, is still preserved as part of the edifice: the Ecclesiastical Commissioners have lately granted £107 towards its repairs*'. The Glebe House associated with the church at Tallaght, which stood in its own grounds close to the proposed development lands, is described by Lewis as standing on a glebe of 17 acres (Lewis 1837).

11.3.3 Cartographic Analysis

Down Survey map of the Barony of Uppercross, c. 1656

The earliest maps showing the proposed development lands are William Petty's Down Survey parish and barony maps, dating from c. 1656 (Figure 11.2). The site straddles the townland boundary between Cookstown, which was forfeited from the Catholic Adam Talbot, and Tallaght, which was unforfeited. Tallaght, being unforfeited, had no detail other than the presence of the ecclesiastical site ('Tallagh Church') and village ('Tallagh tonne') is depicted. This is clearly the principal settlement in the area, with houses of varying sizes to the east of the church, which is shown as a large building with a tower (St Maelruan's Church; RMP no.: DU021-037003).

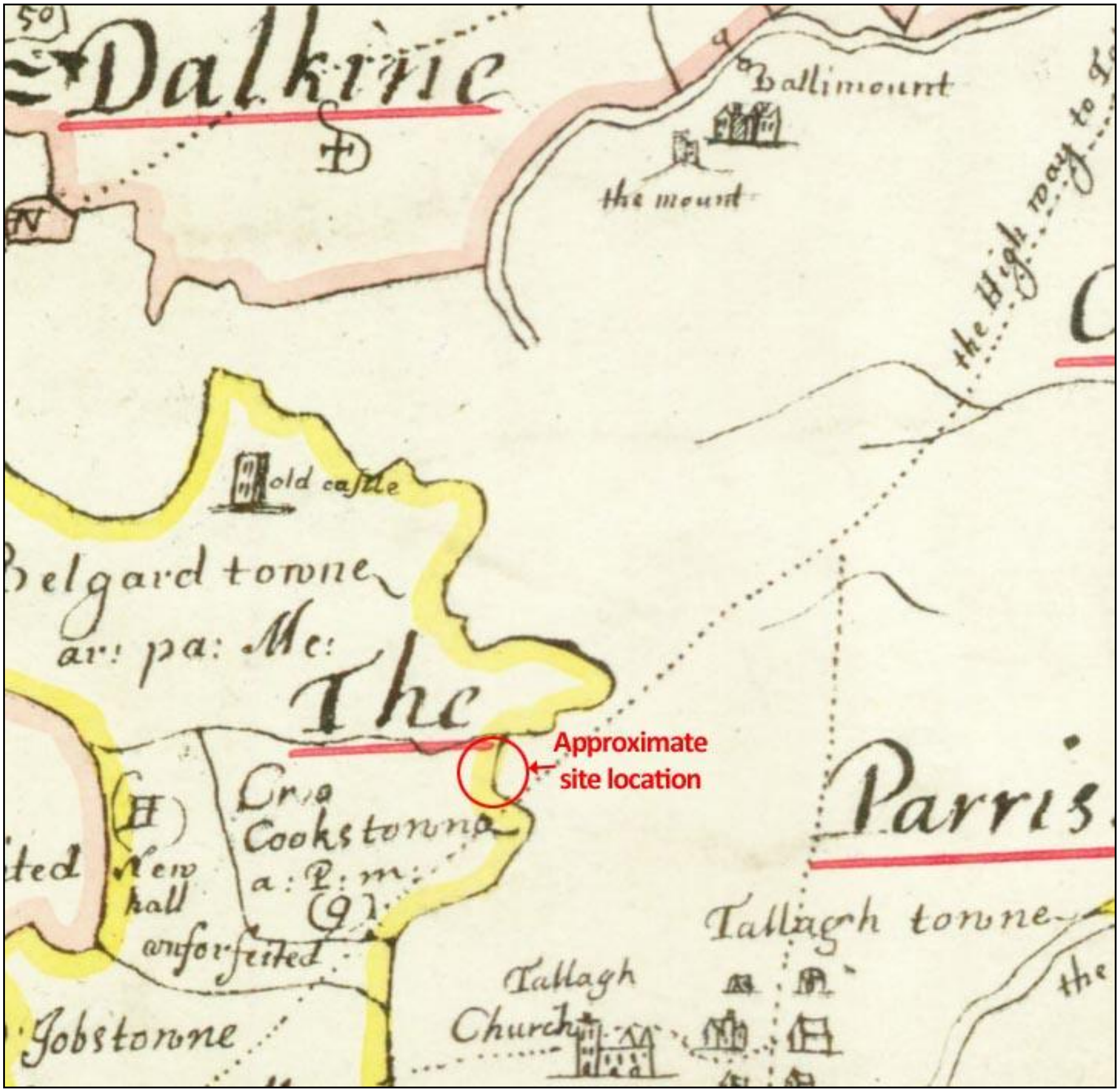


Figure 11.2 Down Survey map, c. 1656

Three principal routeways are shown travelling through the area and enclosing the area within which the proposed development lands are located: '*the lower way from Dublin to Ballimon Eustace*' heads southwest, diverging from the '*highway to Tallaght from Dublin*'. This road no longer exists, but it appears to have diverged from the '*highway to Tallaght'* in Kilnamanagh in the vicinity of Kilnamanagh Castle (RMP no.: DU022-005001), passing through the northern extent of Tallaght townland and into Cookstown. The road would likely have passed outside of the southern extent of the proposed development site. A third un-named route crossed west / southwest from Tallaght village.

The adjacent townlands of Belgard and Whitehall (Newhall) are depicted, with Jobstown to the south, and 'the mount' at Ballymount to the northeast. There is no further detail on the Down Survey parish map, though the accompanying parish terrier describes 'Tallaugh Parish', which included '*forfeited lands including Jobstowne, Whits town, Bellgard towne and Cookes towne ...* [and that] *there stands at Jobstowne a Castle in Repaire, and some Cotages and Cabbins and in Belgard an Old Castle made Habitable*'.

John Rocque's Map of the County of Dublin, 1760

The original course of the Old Belgard Road is shown to have diverged from the existing Old Belgard Road adjacent to the proposed development site, before traversing the site and continuing northwest to pass the southwest sides of Belgard Castle and Newlands House. A structure is depicted on the south side of this road within the development area. A roadway is also depicted extending from Jobstown north past Fettercairn House to Belgard Castle. Landscaping of the grounds of Belgard Castle and Newlands Demesne caused both of these roads to be subsequently redirected.

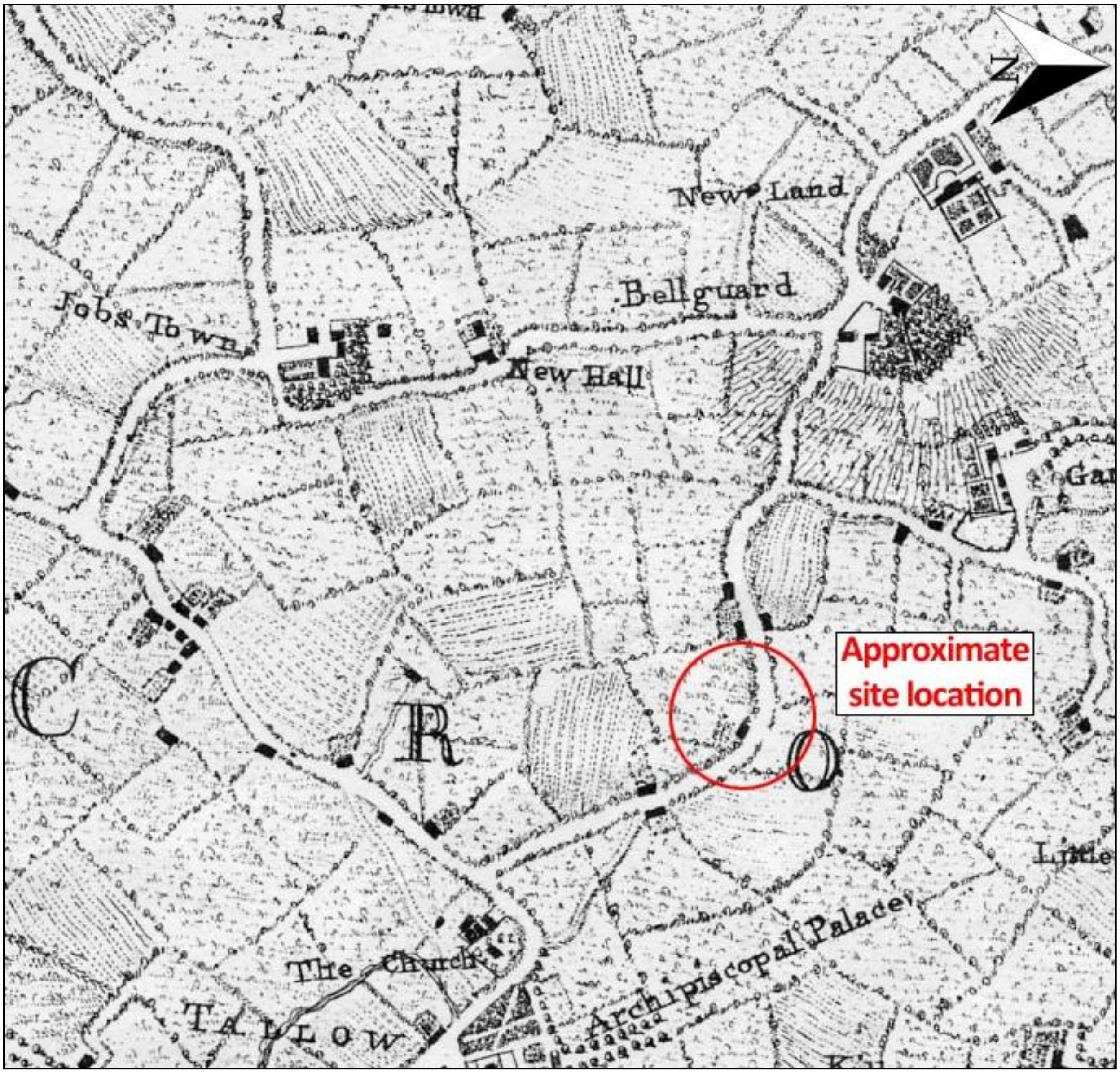


Figure 11.3 Rocque's Map of the County of Dublin, 1760

The area is shown to be predominantly rural in character, with several named houses and estates depicted as well as a small number of roadside dwellings. Belgard ('Bellguard'), Jobstown and New Hall are all shown as single houses with associated buildings, although none are depicted as castles; this may demonstrate the subsequent development of the castles indicated in the townlands on the Down Survey map as fortified dwellings. Pasture and arable fields are shown, with the proposed development site shown as pasture. Tallaght ('Tallow') is shown as a substantial village, with 'The Church' and 'Archipiscopal Palace' both named.

John Taylor's Map of the Environs of Dublin, 1816

Taylor's 1816 map shows that the grounds surrounding Belgard Castle and Newlands House had been redesigned into a parkland and designed landscape. This may have followed the construction of the three-storey country house attached to the castle in c. 1775. This redesign caused the Old Belgard Road to be diverted to the northeast side of the demesne, while the road from Jobstown was diverted east along the Cookstown / Belgard townland boundary. The remnants of the old course are depicted as paths, one of which is within the lands of the proposed development. The dwelling which was depicted on Rocque's map is indicated on this road segment.

Another path extends from the Old Belgard Road westwards, to the south of the proposed development site. The dwelling adjacent to it was also shown on Rocque's map. It is possible that this is a remnant of the former '*lower way from Dublin to Ballimon Eustace*' which was depicted on the Down Survey map and which passed between Kilnamanagh and Jobstown.

Tallaght is simply depicted, with the 'Archbiship of Dublin's Palace', the castle, St. Mael Ruain's Church, the Tallaght Commons, a Glebe House and the post office featured.

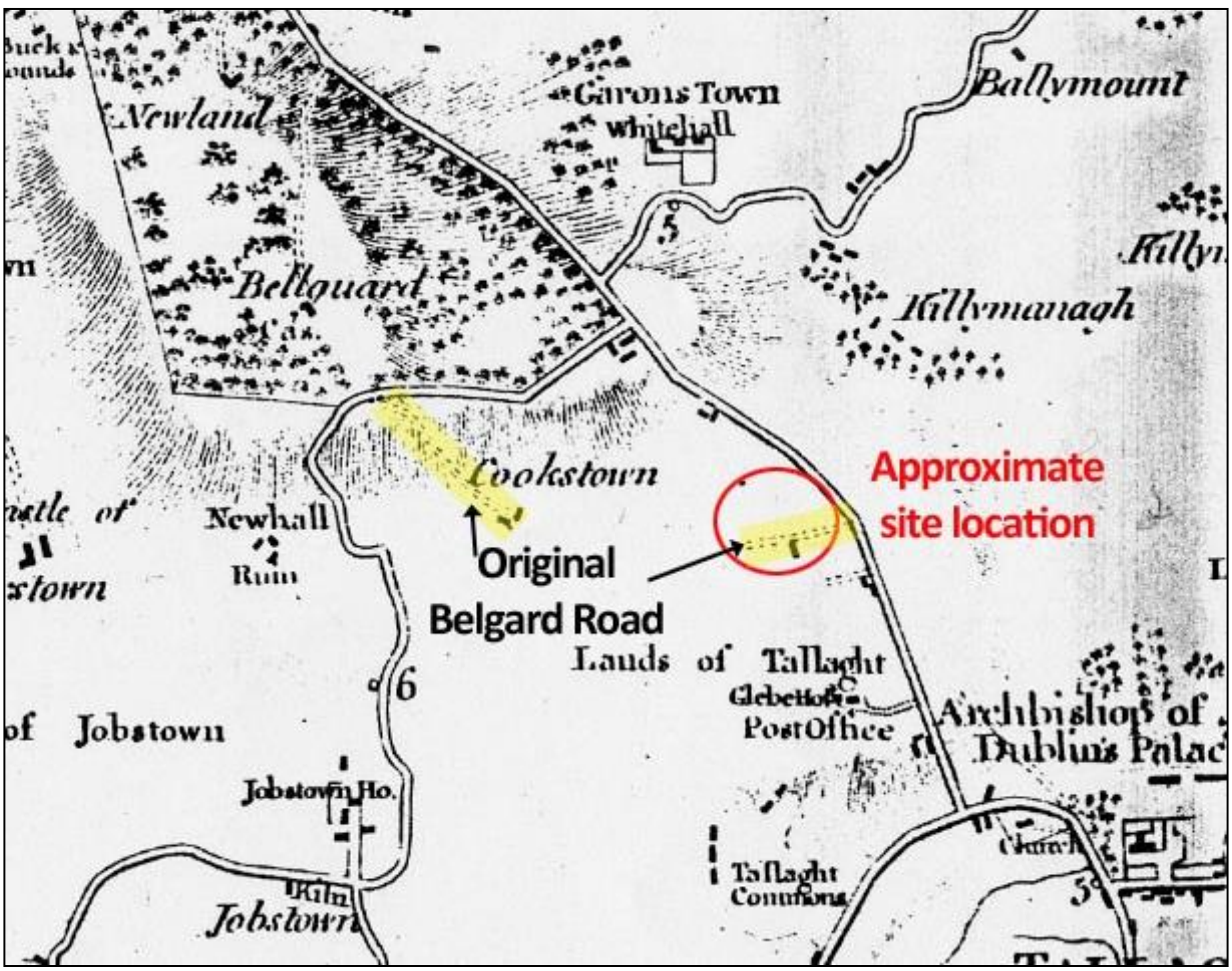


Figure 11.4 Taylor's Map of the Environs of Dublin, 1816

Ordnance Survey map editions, 1843-1938

Greatest cartographic detail is provided on the historic Ordnance Survey (OS) six-inch series maps, the first of which was surveyed between 1837 and 1843. The First Edition OS map (1843) depicts the Cookstown / Tallaght townland boundary within the development site, although it is largely within the course of the Cookstown Estate Road. The serpentine course of the boundary may be indicative of a former water course, although no such feature is indicated on any historical mapping.

The original course of the Old Belgard Road is shown as a short cul de sac, extending west from the later diversion through the proposed development lands. Two dwellings, one of which is within the proposed development site, are depicted on the south side of the road with small yards or garden plots. This appears to be the structure which was depicted on Rocque's and Taylor's maps. A third dwelling is within a triangular plot adjacent to the Old Belgard Road. The former roadway can be roughly traced along field boundaries, with a double tree line within Belgard townland to the northeast representing a continuation of the original course of the road. Further north on the Old Belgard Road, a small structure is indicated at the site of what would later be named Garrynisk.

The laneway to the south is depicted, with the change towards long linear fields on its south side perhaps an indication of the antiquity of the road. The farmland in this area is otherwise made up of large, regular fields. Some quarrying activity is indicated in Cookstown, Belgard, Kingswood and Kilnamanagh.

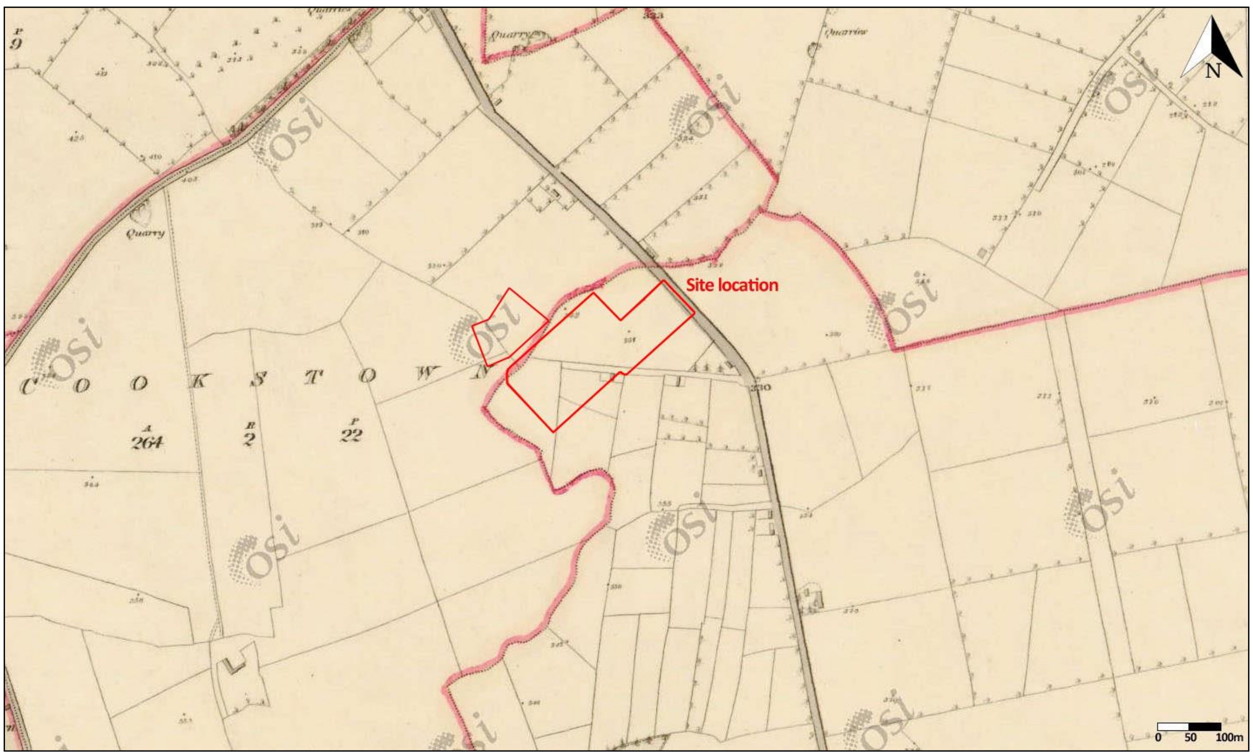


Figure 11.5 Ordnance Survey first edition six-inch map, 1843

In the wider landscape (not shown), the First Edition OS map shows a number of medium-sized and large country houses in the area such as Fettercairn House (beside the smaller Newhall Cottage), Jobstown House, Killinarden House, Kilnamanagh House, White Hall (Garranstown / Kingswood), Belgard Castle and the substantial Newlands House and demesne.

Tallaght village and its numerous recorded monuments are depicted in detail (not shown), with the remains of the ecclesiastical enclosure retained in the curving boundary wall containing the church and graveyard

(RMP no.: DU-021-037002 & 003). The ‘Old Castle’ (RMP no.: DU021-037010), its associated buildings and gardens dominate the northern half of the village, beside or possible within the grounds of Tallaght House.

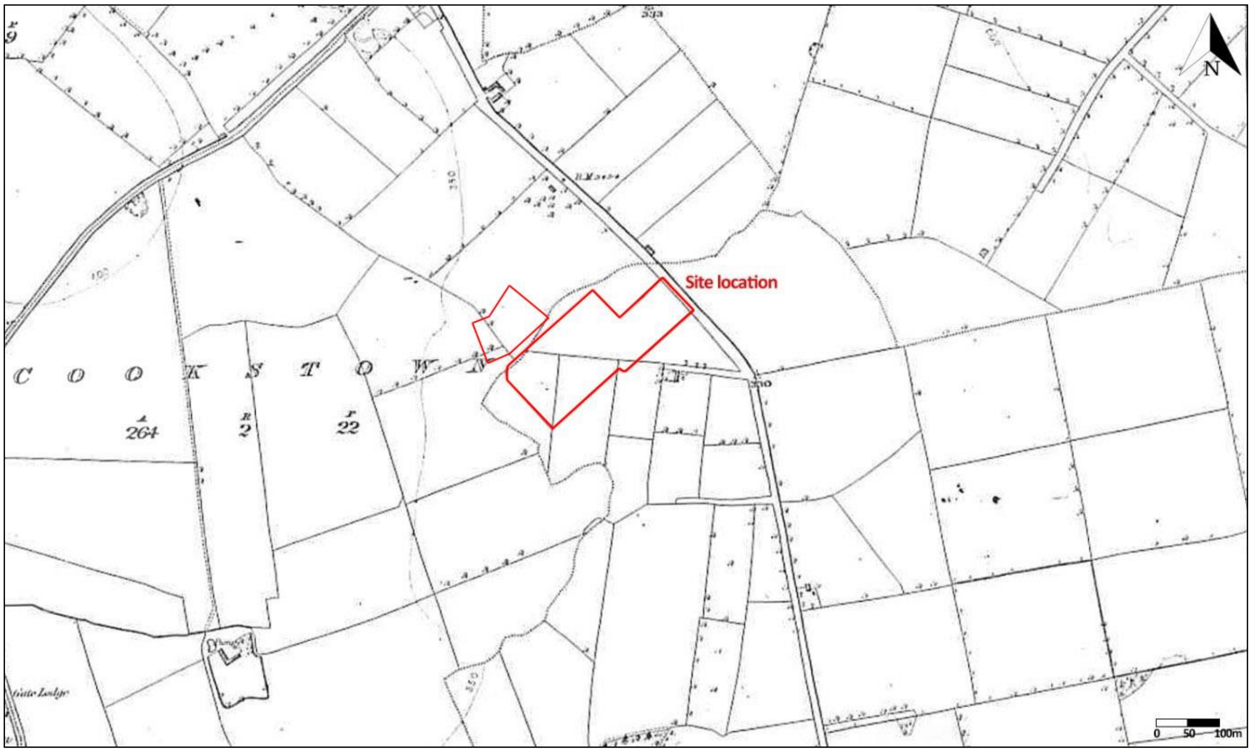


Figure 11.6 Ordnance Survey second edition six-inch map, 1871

By 1871, the Second Edition OS map shows that only a small portion of the original Belgard Road was still in use as a laneway, and the dwelling which had been within the proposed development site was no longer present. The neighbouring house and plot were still present, with a small well located east of the house. The third house which had been adjacent to the Old Belgard Road also appears to have been removed. The boundaries related to both of these houses were removed to create larger fields, and it is likely that the houses were demolished at this time. It is evident that the house that would become known as Garrynisk to the north had undergone a number of extensions.

The laneway to the south appears unchanged since the previous edition, although several field boundaries south of the lane had been removed to create a more open farming landscape.

The Dominican Priory of St Mary had been constructed on the site of the ‘Old Castle’ in Tallaght village by this time, and a number of other named houses were constructed such as Airfield House and Bathampton Cottage.

The Third Edition of 1907-9 (not shown) shows few changes to the landscape, but the final house on the laneway may have been in ruins by that time.

By the time of the 1935-38 edition OS map (Figure 11.7), additional field boundaries had been removed within the proposed development lands and the adjacent areas, and the laneway had been removed. New development along the Old Belgard Road is evident to the south of the site, with the Urney Chocolate Factory, Colbert’s Fort Cottages and a sewage works depicted. This is the first map edition in which Garrynisk is a named house.

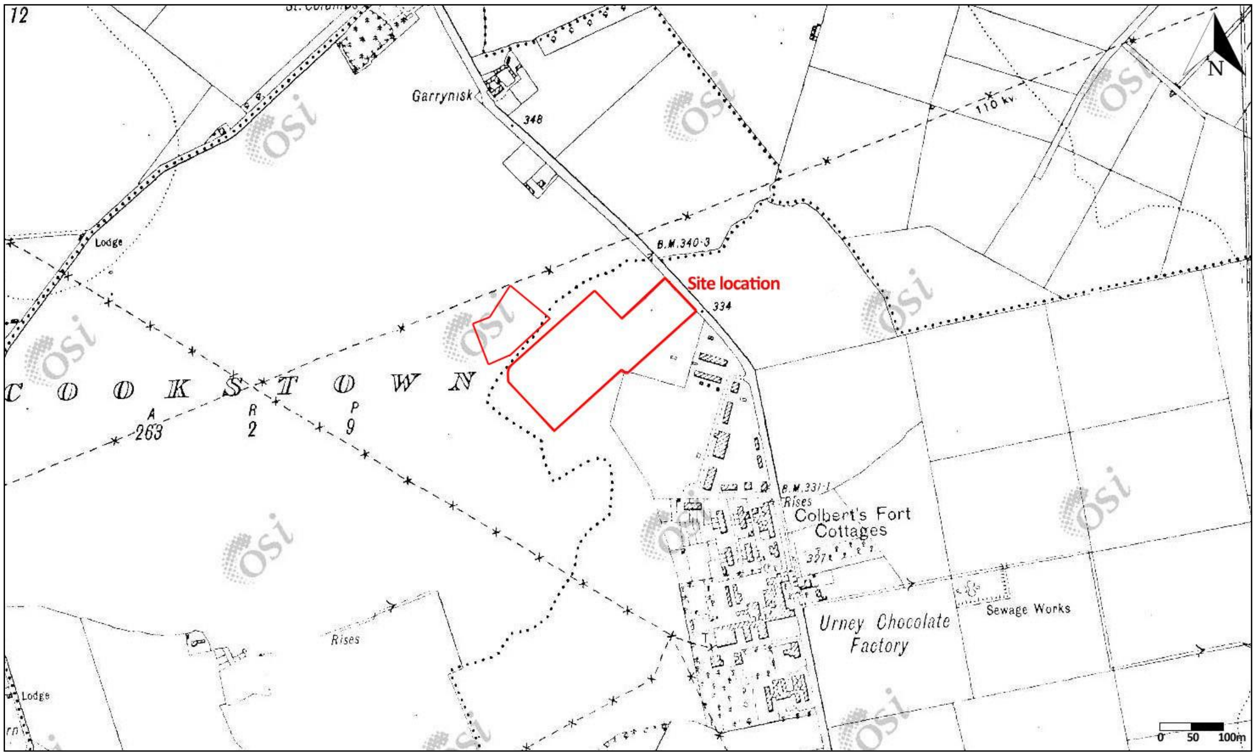


Figure 11.7 Ordnance Survey revised edition six-inch map, 1935-38

11.3.4 Archaeological and Cultural Heritage

Recorded Archaeological Sites (RMP / SMR) and Stray Finds

There are no recorded archaeological sites within or in close proximity to the proposed development lands. The closest recorded archaeological sites are clustered in the historic centre of Tallaght village (RMP no.: DU021-037), c. 1km to the southeast of the proposed site, and represent for the most part remains associated with the early and later medieval ecclesiastical site (Figure 11.8).

Another cluster of monuments occur 1.2km to the northeast in Kilnamanagh. They comprise of a castle, ecclesiastical enclosure and associated features (RMP no.: DU022-005001-9) and the site of a well which may have been a holy well (RMP no.: DU022-006).

The ground rises towards the northwest at Cheevertown, Belgard and Newlands, where a ringfort (RMP no.: DU021-025; 1.3km northwest) and two castles (RMP no.: DU021-024001, DU021-026; 1.8km west; 1.1km northwest) occupy the high ground.

Relevant sites in the wider area are discussed in the context of the archaeological and historical background above (Section 11.3.2).

A significant number of stray finds are provenanced to Tallaght townland and village in the National Museum topographical files, representing human activity in the area from the prehistoric period onwards. These include the Stowe Missal Shrine (NMI Reg. No. 1929:1315), a bronze palstave and cup or bowl (NMI Reg. No. 1973:213 & 1973:214), portions of a pewter chalice (NMI Reg. No. 1957:41), four copper axeheads (NMI Reg. No. 1955:24,25,26,27), a stone axehead (NMI Reg. No. 1934:466), a group of post-medieval artefacts (NMI Reg. No. 1976:94-146) and sherds of a cinerary urn (NMI Reg. Nos 556D, W10, WR93, 557D, W10a, WR94). These are discussed in the context of the archaeological and historical background above (Section 11.3.2).

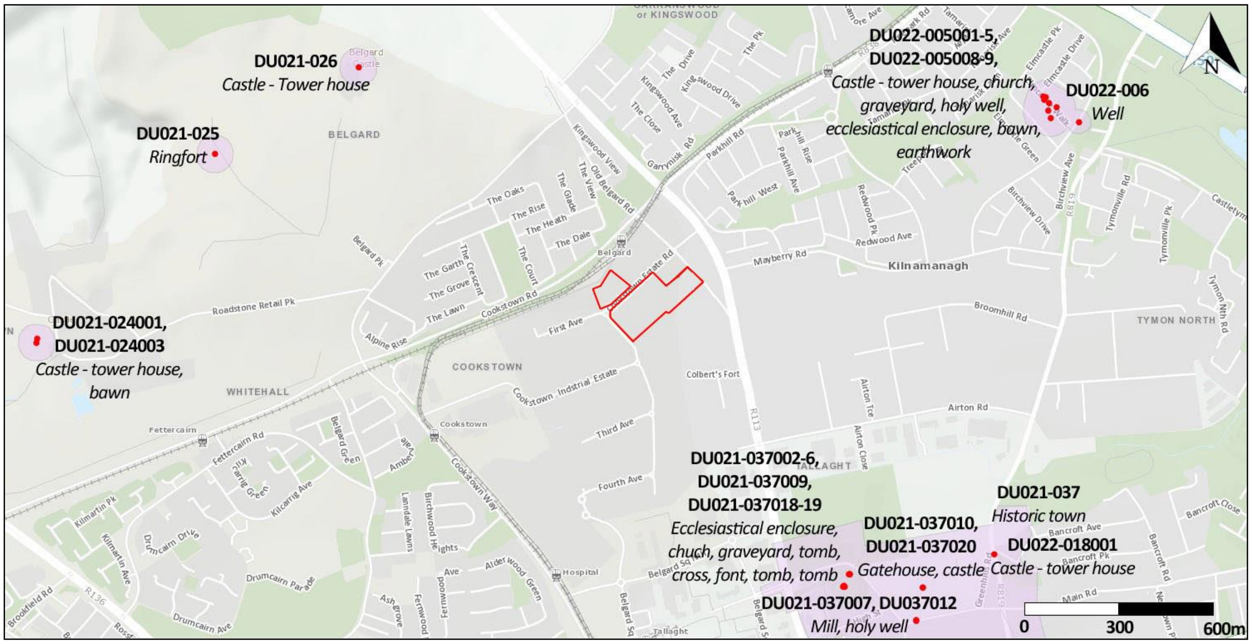


Figure 11.8 RMP map showing proposed development site

Previous Archaeological Investigations

There is no record of any previous archaeological investigations within the proposed development lands. The closest archaeological investigation was at the site of the former Tallaght Aerodrome on Belgard Road (Colfer 2017; Licence no.: 17E0489). Some evidence of the Aerodrome was revealed, but the majority of associated features would have been destroyed during the construction of later factories on the site. A small amount of charcoal and ash was identified which may have been prehistoric, but it was noted that soil removal and disturbance on the site made it unlikely that further evidence of this type would survive.

The majority of investigations in the wider area have been in and around Tallaght Village. In Tallaght, the majority of the investigations took place in advance of the construction of the college (Tallaght Institute of Technology) located on the north / northwest side of the village, in proximity to St Maelruan's Church and the early medieval ecclesiastical settlement (DU021-037002 to -004).

Archaeological testing in 1990 to the northeast of the church yielded several features of medieval date, including a hearth with an associated floor level, with over fifty sherds of medieval pottery also recovered (Gowen 1991). Additional investigations in 1990 to the west of the existing curving boundary of the church revealed an enclosing fosse of probable medieval date (Newman 1990), while archaeological testing at the college entrance on the Blessington Road in 1991 revealed two concentric ditches (Gowen 1992); these were interpreted as enclosing ditches associated with the church and were excavated in 1994 (McConwa, 1995). Further test excavations to the west (McConway 1996) and north (Walsh 1998) of St Maelruan's graveyard revealed the continuation of the enclosing ditch, with burials cutting into the bank of the medieval ditch on the north side (Walsh 1998). Archaeological monitoring of an ESB cable within the college grounds in 1996, exposed the edge of a stone wall and produced a small amount of human bone (Conway & Hickey 1996).

Outside of the college, other evidence for the early medieval and medieval activity in Tallaght has been revealed on its south side. Archaeological testing in 1990 in Main Street revealed a large ditch, which was interpreted as part of the boundary defences of the medieval Borough of Tallaght (O'Brien 1991a). Further investigations by O'Brien in the same year on the eastern side of the Old Bawn Road revealed a bank and ditch dated to the early medieval period (O'Brien 1991b; designated RMP site DU021-037013).

Several of the archaeological investigations undertaken in and around Tallaght village and townland have revealed no archaeological features or deposits. Archaeological testing was undertaken at the site of the gate lodge and pond located in the grounds of the present Dominican priory. The priory had been a residence of the Archbishop of Dublin, before being taken over by the Dominican order in the mid-19th century. Although the gate lodge and pond can be identified on late 18th and early 19th century cartographic records that show the residence, no evidence for the gate lodge structure was uncovered (Bolger 2002). A programme of geophysical survey within the archaeological constraint area for Tallaght (DU021-037) was undertaken in advance of development in September 2004 (Leigh 2004; Licence No. 04R136). Although there were some anomalies of possible archaeological nature, subsequent testing found nothing of archaeological significance (Molloy 2005; Licence No. 05E0316).

A limited programme of archaeological monitoring was carried out in 2010 along the proposed route of Metro West from Belgard Road, Tallaght to Fonthill Road, Clondalkin. Although two of the trenches to be monitored were located in Cookstown townland, adjacent the Cookstown / Belgard townland boundary, these were excavated in the absence of an archaeologist and allowed no comment on the subsurface stratigraphy in these locations (Bolger 2010; Licence No. 10E0389).

Aerial Photographic Analysis

An examination of the available aerial imagery from 1995 to 2020 shows no change from the present structures and layout (Figure 11.9). The proposed development lands comprise two brownfield sites directly opposite each other on the Cookstown Estate Road in the northeast of the Cookstown Industrial Estate. Each site is occupied by existing buildings and hard surface yard / parking areas, set out in the later 20th century when the industrial estate was developed. A narrow band of rough grassy vegetation on the northern segment is the only area which has not subject to construction or surfacing.

Figure 11.9 Aerial imagery showing proposed development lands (Google Earth 2018)

Townland Boundaries

The boundaries were described and recorded in the great surveys following the land confiscations of the mid-17th century and were further standardised in the mid-19th century with the work of the Ordnance Survey. Townland boundaries were often laid out along natural features including rivers, streams and high ground or manmade features such as roads and walls (Nolan 1982). Townlands and other landholdings were further subdivided into individual fields generally by means of earthen banks, which over time were colonised by hedgerow and trees. The typology of the boundaries can vary in different parts of the country, with some areas favouring distinctive high, wide earthen banks or just stone walling; sometimes there is a combination of earth and stone, with a stone-revetment or a facing on an earthen bank. It is increasingly rare to find surviving examples of townland boundaries in the more built-up areas of County Dublin, with the majority destroyed to make way for urban and suburban development.

The proposed development lands lie within the townlands of Tallaght. A short segment of the Tallaght / Cookstown townland boundary falls within the site boundaries, but is mostly within the course of the Cookstown Estate Road. The serpentine nature of this townland boundary may indicate that it followed a former watercourse, although no such feature is indicated on historical mapping. The development of the area in the 20th century is likely to have destroyed any remnants of the townland boundary, but it is possible that a subsurface feature such as a ditch may survive beneath the made ground.

Placename Evidence

Townland names are a rich source of information, not only on the topography, land ownership and land use within the landscape, but also on its history, archaeological monuments and folklore. Where a monument has been forgotten or destroyed, a place name may still refer to it and may indicate the possibility that the remains of certain sites survive below the ground surface. The OS surveyors wrote down townland names in the 1830s and 1840s, when the entire country was mapped for the first time.

The mapmakers, soldiers and antiquarians who collected the placenames and local history varied in their interests and abilities. While most placenames were anglicised or translated relatively accurately, some were corrupted virtually beyond recognition. Nonetheless, a variety of placenames – whether of Irish, Viking, Anglo-Norman, English, or, in very rare cases, Anglo-Saxon origin – appears throughout Ireland, and the appearance of the different languages is often a good indicator of the cultural heritage, and therefore the archaeological record of the area.

The townland names in the Tallaght area parallel closely the historical and archaeological record of the region, reflecting both the presence of English and Anglo-Norman settlers in the fertile lowlands, and native Irish in the foothills of the mountains. The documentary records for this area are extensive and the English language placenames preserve the names of the individual landowners, like Cookstown, Jobstown, Whitehall (formerly Newhall) and Whitestown. In the case of Jobstown, the original name of the townland which was replaced by the new landowner, is recorded as *Rath Miontáin*; the rath element of its original name implies the presence of earthen ringfort in the townland though none is recorded there now. Old Bawn is another English name found in the lowlands, around the River Dodder. Its origins are unclear, but it may be a reference to the 16th / 17th century house recorded there.

Irish names tend to cluster on the higher ground, and contain references to both topography and archaeological or historical activity in the area. Belgard is likely to derive from *An Bealach Ard*, meaning high way, road or pass and is undoubtedly a reference to the natural hill on which the castle once stood. Tallaght itself is derived from *támh leacht*, a plague burial. This name, said by medieval references to refer to the pseudo-historical Parthalonians, may actually refer to a tradition of medieval burials, or to the many prehistoric burials which have been found in the vicinity. Kilnamanagh, on high ground to the east of Belgard is another Anglicisation of a native Irish name – *cill na manach*, meaning ‘church of the monks’. The townlands of Tymon North and South have their origins in a corruption of a local family name – ‘*Tigh Munna’* meaning ‘Munn’s house’ (OS Name Books) or the ‘inheritance of the O’Mothans’ (Ball 1906).

The contrast between the Irish and English names in this area, coupled with the location of the English names in the lowlands and Irish names in the uplands, underlines the nature of this area as a frontier landscape. The Pale formed the frontier not only between two geographic areas, but between social, linguistic, political and cultural worlds.

Features of Cultural Heritage Interest

Apart from the townland boundary (See above: Townland Boundaries), it is evident from Roque's map of 1760 that the original course of the Old Belgard Road traversed the proposed development lands, and a dwelling was also depicted within this area. A redesign of landscaping at Belgard Castle and Newlands House caused the road to be diverted to the existing course, and the former course is evident in Taylor's map of 1816 as a short cul de sac within the development area with what appears to be the same dwelling adjacent to it. This road segment and dwelling were removed some time between the First Edition Ordnance Survey of 1843 and the Second Edition of 1871. There are consequently no upstanding features of cultural heritage interest within the proposed development lands.

11.3.5 Architectural Heritage

The built heritage character of the area immediately surrounding the proposed development lands is dominated by modern retail, industrial and residential development and most of the old road network has been widened, upgraded or realigned. In the wider area, there are some elements of the historic built heritage character surviving, notably in Tallaght village which has been a centre for settlement since the early medieval period.

Tallaght village contains a variety of monuments and structures of early medieval, medieval and post-medieval date. St Maelruain's Church (RPS no.: 271 NIAH no.: 11215004), graveyard and tower now occupy the site of the early medieval monastery that was founded there in the 8th century AD. The present-day church was designed by the architect Semple in 1829, while the tower beside the church was formerly attached to an older, possibly medieval church which was demolished in 1820. The curvilinear enclosure of the original monastic settlement is partly preserved in the narrow curving street that connects the Belgard Road to Main Street, lending some historic character to what has become a very urbanised environment.

Several of the protected structures are located beyond the priory walls on the north side of Main Street. These include the remains of a gatehouse (RPS no.: 269) associated with the medieval castle that was built in 1324 to defend the settlement from the Irish tribes in the mountains nearby. The present priory grounds were also the site of the Archbishop's palace in the 18th century, when much of the land in the Tallaght area was under the control of the Archbishop of Dublin. The palace was subsequently demolished and replaced by Tallaght House, which was constructed in 1820. In 1855 the Dominicans purchased the lands and buildings from a Mr Lentaigne and founded the Priory of St Mary, living in Tallaght House and the surviving tower house (gatehouse) of Tallaght Castle. In 1864 they opened the present priory building (RPS no.: 270; NIAH no.: 11215001), adding extensions in 1901 and 1957. The Dominican Retreat House, built in the 1960s incorporates the 19th century Tallaght House which is concealed within the modern fabric.

The village was connected to Dublin by tram in the 1890s and this led to considerable redevelopment in Tallaght. The character of the village centre (Main Street) today is largely defined by the attractive and substantially intact early 20th century houses in the village, with the stone boundary walls and mature trees of the priory greatly enhancing the historic character.

The remaining protected structures in the wider landscape represent rare survivals of late 18th or 19th century domestic architecture in this otherwise urbanised area, including: an example of a small country house and associated single-storey dwelling, White Hall House in Kingswood (RPS No.: 197; NIAH no.: 11210002); a large farmhouse, formerly Fettercairn House (RPS No.: 262; NIAH no.: 11214013); and a single storey semi-detached house of early 20th century local authority design (NIAH no.: 11214014). These structures are not readily apparent in the landscape, being mostly dwarfed or overshadowed by the surrounding modern development or otherwise screened by their boundary walls and mature planting.

Several sites of architectural merit are also recorded to the north of the proposed development site in Belgard and Kingswood. Most notable is Belgard Castle (RPS no.: 206; NIAH no.: 11209081), stables (NIAH no.: 11209082) and former gates (NIAH no.: 11210005, 11210001). The Castle comprises of the former tower house (RMP no.: DU021-026), with an attached three storey country house dating to 1775. An early 20th century Celtic Revival style memorial cross (RPS no.: 207; NIAH no.: 11210003) is also located adjacent to the junction of the Belgard Road and the Ballymount Road.

Record of Protected Structures and NIAH Sites

There are no protected structures recorded in the South Dublin County Development Plan (2016-2022) within or in proximity to the proposed development lands, nor are there any additional structures of architectural heritage merit listed in the NIAH.

There are some structures of architectural heritage merit in the wider area, with the closest being Belgard Castle and associated features (1km) to the northwest (RPS no: 206; NIAH no.: 1120981-2, 1121001, 11210005). Tallaght Village, 1km to the southeast, is also the site of a number of protected architectural structures. This cluster is predominantly ecclesiastical in nature and includes two recorded archaeological monuments – St Maelruain's Church & Monastic Enclosure (RPS Ref. 271; NIAH no.: 11215004; RMP DU021-037) and Tallaght Castle Gate (RPS Ref. 270; RMP DU021-037010) – as well as St Mary's Dominican Priory and Church (RPS Refs 269 & 273; NIAH no.: 11215001-2).

Architectural Conservation Area

The proposed development lands are not located within or close to an Architectural Conservation Area (ACA). The nearest ACA to the site is Tallaght village, c. 1km to the southeast of the site (South Dublin County Development Plan 2016-2022).

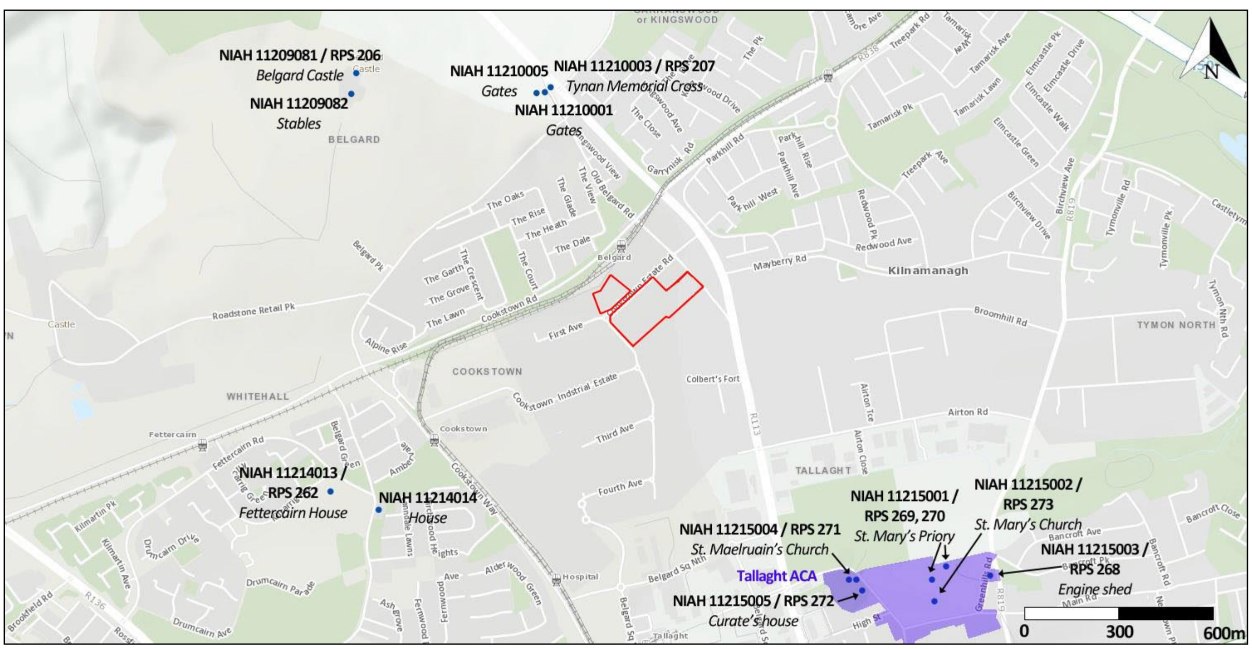


Figure 11.10 Architectural sites in the Tallaght / Belgard area

11.4 Site Inspection

A site inspection was carried out on 2nd October 2019 and 17th of June 2020 in order to confirm the absence of cultural heritage features above the surface. The site comprises of modern commercial buildings and hard surfaces of concrete and tarmacadam, surrounded by a combination of brick and metal fencing. The ubiquity of made ground and hard surfaces in the area significantly reduces the potential for the existence of undisturbed subsurface remains. However, a strip of rough grass and vegetation between the existing buildings on the northern segment may be undisturbed and there is therefore more potential for the survival of such features.

The site of the townland boundary is covered by tarmacadam surface, brick wall, footpath and the Cookstown Estate Road, while the site of the original course of the Old Belgard Road is similarly occupied by tarmacadam surfaces and a commercial building.

Plate 11.1 View of southern segment from Cookstown Estate Road

Plate 11.2 Site of townland boundary within site boundaries

Plate 11.3 Site of townland boundary along Cookstown Estate Road

Plate 11.4 South corner of site

Plate 11.5 View of southern segment from Old Belgard Road

Plate 11.6 View of southern segment from Old Belgard Road

Plate 11.7 View of northern segment from Cookstown Estate Road

Plate 11.8 Strip of grass in northern segment

11.5 Characteristics of the Proposed Development

The proposed development will comprise of the following:

(i) Demolition of the existing industrial buildings (15,989sq.m);
(ii) Construction of a mixed-use development featuring: (a) 1104 no. 'build-to-rent' apartments in 4 no. blocks varying in height from four to eleven storeys; and (b) 4 no. commercial units, 1,500sqm of office space and a crèche. The development is served by a total of 357 no. parking spaces and 1860 no. bicycle spaces;
(iii) Road, junction and streetscape upgrade works along First Avenue, Cookstown Road and Old Belgard Road, including the installation a signalized junction at the intersection of First Avenue and Cookstown Road and Old Belgard Road and Cookstown Road;
(iv) Construction of 3 no. new roads and 1 no. pedestrian/cycle link to the Belgard Luas Stop;
(v) Construction of a public plaza in the south-western corner of the site; and
(vi) Associated site and infrastructural works are also proposed which include: foul and surface water drainage; attenuation tanks; lighting; landscaping; boundary fences; plant areas; ESB substations; internal hard landscaping, including footpaths and street furniture; and all associated site development works.

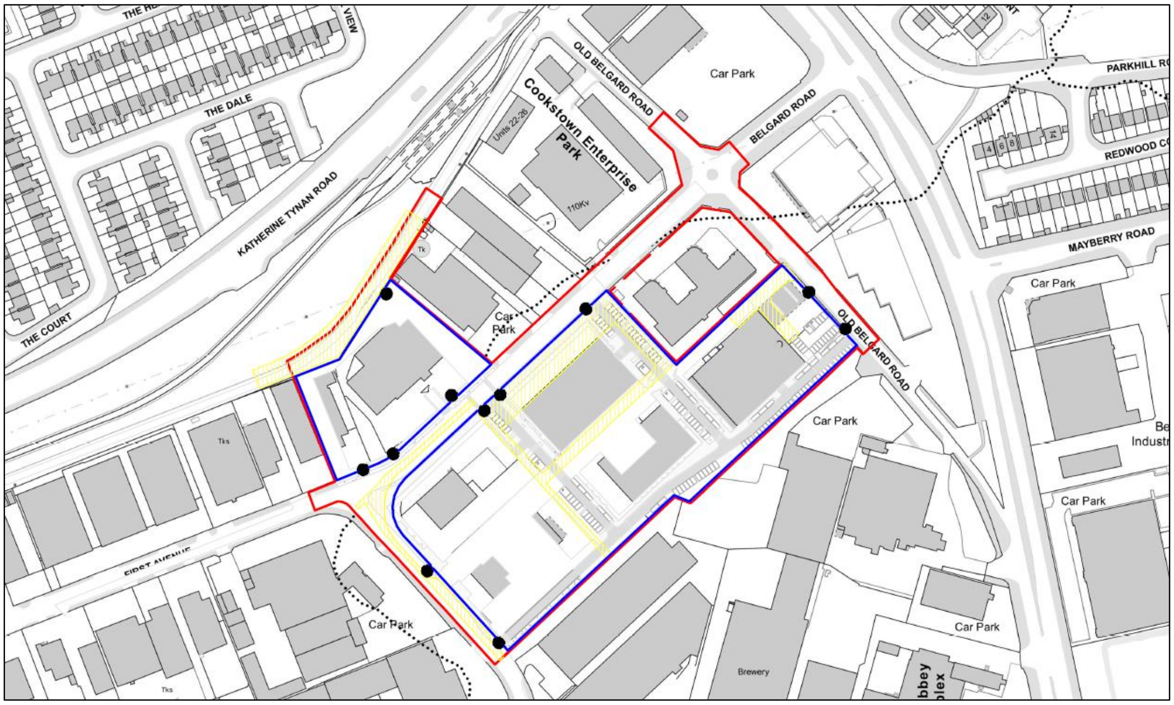


Figure 11.11 Existing site and road layout

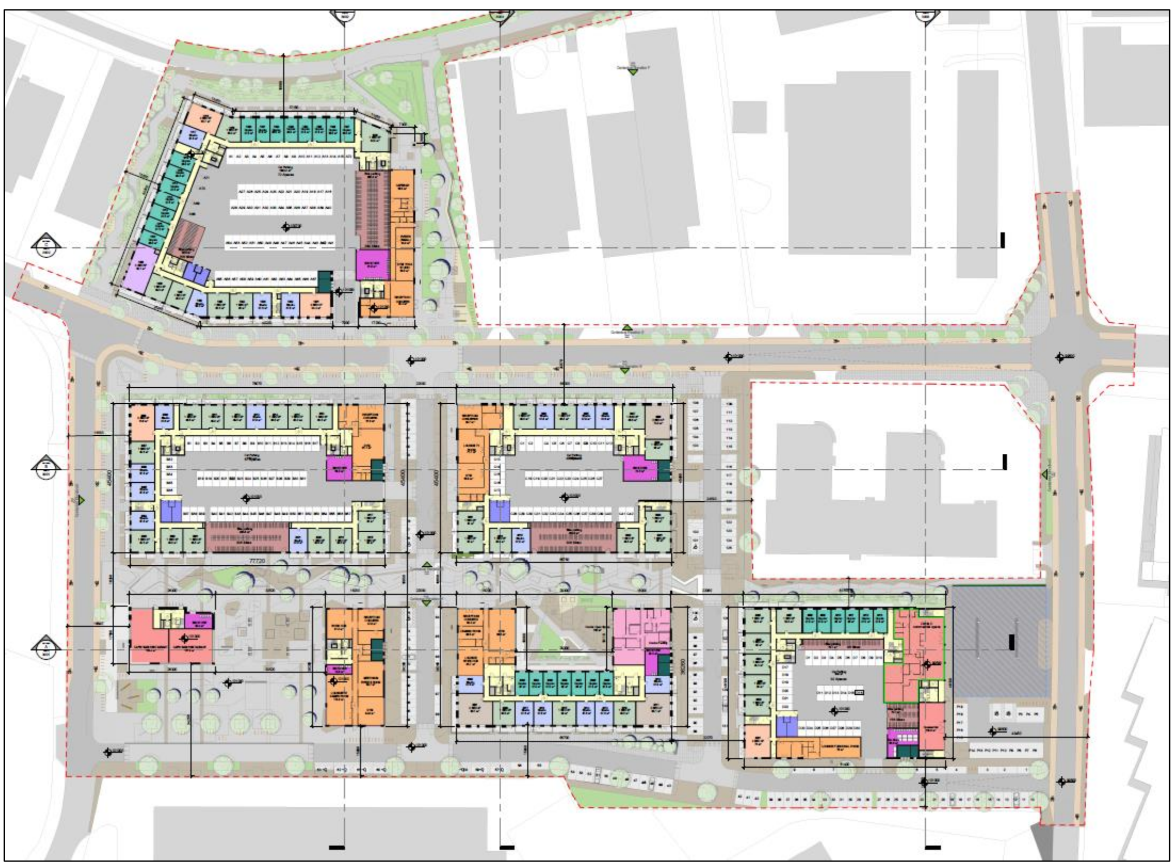


Figure 11.12 Proposed site layout (Level 0)

11.6 Potential Impact of the Proposed Development

11.6.1 Construction Phase

Archaeology and Cultural Heritage

There are no known or recorded archaeological sites (RMP / SMR sites) within or in close proximity to the proposed development lands. In the wider receiving environment, the closest recorded archaeological sites are clustered c. 1km southeast in the historic village of Tallaght (RMP DU021-037), which has been a centre for settlement since the foundation of a monastery there in the early medieval period.

A study of historic cartographic sources revealed a number of features of archaeological and cultural heritage interest within the development area, including the Cookstown / Tallaght townland boundary, the original course of the Old Belgard Road which was realigned c. the late 18th century and which survived as a cul de sac within the proposed development site until the mid-19th century, and the site of a dwelling which was demolished in the mid-19th century.

The use of the proposed development lands as part of the later 20th century industrial estate has greatly reduced their archaeological potential, with existing buildings and hard-surface areas throughout, although one strip of grass and vegetation in the northern segment may be less disturbed. There is no record of any archaeological investigation undertaken within the proposed development lands, prior to the construction of the existing buildings. It is highly likely that if any archaeological features do survive related to the townland boundary, former road or dwelling, they have experienced a significant degree of disturbance due to the amount of development on the site to date.

It is possible, nonetheless, that disturbed or truncated archaeological features will have survived beneath the surface, and within the strip of grass within the northern segment. This development has the potential to reveal such sub-surface features and to directly impact them. Given the previous development of this area without archaeological oversight, this may provide a positive opportunity to record potential features even in a truncated or diminished state.

Architectural Heritage

The proposed development lands are located within a highly urbanised landscape. There are no protected structures or features of architectural merit within or in the vicinity of the proposed development lands. Architectural heritage in the wider area will not be negatively affected by the development of these lands.

11.6.2 Operational Phase

No impact to archaeological, architectural or cultural heritage is predicted during the Operational Phase of this development.

11.7 Do-Nothing Approach

In the “do-nothing” scenario the proposed site would not be redeveloped and therefore there would be no adverse impacts to any potential subsurface archaeological deposits, features or finds, nor to any features of architectural heritage, cultural heritage or historic interest.

11.8 Remedial or Reduction Measures: Mitigation

11.8.1 Construction Phase

While the probability of this development to impact archaeological features is low, it is recommended that a licensed archaeologist oversee the stripping of surfaces on this site following the demolition of upstanding structures. This will provide an opportunity to identify and record any potential surviving or truncated subsurface features which may include:

- The Cookstown / Tallaght townland boundary;
- The former course of the Old Belgard Road;
- Evidence of structures adjacent to the former Old Belgard Road;
- Other features such as field boundaries, archaeological features and deposits.

11.8.2 Operational Phase

No mitigation will be required during Operational Phase.

11.9 Predicted Impact of the Proposal

11.9.1 Construction Phase

If archaeological features are preserved beneath the made ground of the proposed development site, albeit in a disturbed and truncated state, further development is likely to directly impact these features. It is not possible at this time to quantify the significance rating, due to the unknown characteristics of any possible subsurface remains, but cartographic evidence would suggest a low sensitivity value.

11.9.2 Operational Phase

There is no predicted impact for the Operational Phase of this development.

11.10 Monitoring

No post-development monitoring will be required as part of the proposed development.

11.11 Reinstatement

There will be no requirement for reinstatement.

11.12 References

Adams, C.L. (1904) *The Castles of Ireland*, London.

Ball, F.E. (1899) *A descriptive sketch of Clondalkin, Tallaght etc. West Co. Dublin* in J.R.S.A.I. Volume 29 p.95

Ball, F.E. (1906) *A History of the County of Dublin*, Volume IV., Dublin.

Beranger, G., ed P.Harbison (1998) *Antique Buildings of Ireland*. Dublin.

Bolger, T. (2002) 'Greenhills Road, Tallaght' in Bennett, I. (Ed.) *Excavations 2000*, Wordwell Ltd., Bray.

Bolger, T. (2010) *Archaeological Monitoring of utility slit trenching along the proposed route of Metro West, Co. Dublin.* Unpublished report: Headland Archaeology Ltd.

Bradley, J and King, H. (1988) *Urban Archaeological Survey of County Dublin* (unpublished report)

Bradley, J. (1998) 'The medieval boroughs of County Dublin' In Manning, C. (Ed) *Dublin and Beyond the Pale,* Wordwell Ltd, Bray.

Brewer (1825) *County of Dublin in Beauties of Ireland* Vol. I Dublin 208-209

Colfer, N. (2017) *Belgard Gardens, Tallaght, Dublin 24, Dublin.* Available online from: http://excavations.ie/report/2017/Dublin/0026606/
Conway, M. and Hickey, J. 1996 *Archaeological monitoring of the excavation of an ESB cable at Tallaght*

RTC, Co. Dublin, unpublished report, Margaret Gowen and Co. Ltd.

Crowley, C. (2019) *Cultural Heritage Baseline. Lands at Fourth Avenue and Cookstown Road, Cookstown Industrial Estate, Tallaght, Dublin 24*. Unpublished report: Courtney Deery Heritage Consultancy.

D'Alton, J. (1838) *History of the County Dublin*.

Gowen, M. (1991) 'Old Bawn Road, Tallaght' in Bennett, I. (Ed.) *Excavations 1990*, Wordwell Ltd., Bray.

Gowen, M. (1992) 'Site bounded by St Maelruan's Church and Graveyard Belgard Road and Main St., Tallaght' In Bennett, I. (Ed.) *Excavations 1991*, Wordwell Ltd., Bray.

Gwynn, A. and Hadcock, R.N. (1988) *Medieval Religious Houses in Ireland*. Irish Academic Press, Dublin.

Harbison, P. *Cooper's Ireland. Drawings and Notes from an Eighteenth Century Gentleman* Johnson, D.

Newman (1979) *Irish Castles*. No. 61 of the Irish Environmental Library Series, Folens, Dublin.

Johnson, D. Newman (1985) *The Irish Castle*, No. 49 of The Irish Heritage Series, Easons, Dublin.

Joyce, P. W. (1996) *Irish Local Names Explained*, Roberts Books, Dublin.

Joyce, P.W. (1898, 1913) *Origin and History of Irish Names of Places*. Vol. I & III. Dublin.

Joyce, W. St J. (1913) *The Neighbourhood of Dublin: Its Topography, Antiquities and Historical Associations.* Dublin.

Leask, H. G. (1973) *Irish Castles and Castellated Houses*, Dundalk page 144.

Leigh, J. (2004) *Geophysical survey, IT Tallaght Incubation Building, Co. Dublin,* unpublished report, Margaret Gowen and Co. Ltd.

Lewis, S. (1837) *The Topographical Dictionary of Ireland*. Volume I. London.

McConway, C. (1996) 'St Maelruan's, Tallaght' in Bennett, I. (Ed.) *Excavations 1995*, Wordwell Ltd., Bray.

McConway, C.(1995) 'St Maelruan's, Tallaght' in Bennett, I. (Ed.) *Excavations 1994*, Wordwell Ltd., Bray.

McCullough, N. and Mulvin, V. (1987). *A lost tradition: the nature of architecture in Ireland*. Dublin: Gandon Editions.

Meenan, R., (1993) 'Old Blessington Road, Main Street Tallaght' in Bennett, I. (Ed.) *Excavations 1993*, Wordwell Ltd., Bray.

Meenan, R., (1996) 'Vicinity of St. Maelruan's (Docfield development) Tallaght' in Bennett, I. (Ed.) *Excavations 1996*, Wordwell Ltd., Bray.

Molloy, B., (2005) '*Archaeological Assessment, Incubation Centre, Tallaght IT', Dublin 24*", unpublished report, Margaret Gowen and Co. Ltd.

Newman, C., (1990) 'St Maelruan's, Tallaght' in Bennett, I. (Ed.) *Excavations 1990*, Wordwell Ltd., Bray.

O' Brien, B. (1991a) 'Main St, Tallaght' in Bennett, I. (Ed.) *Excavations 1990*, Wordwell Ltd., Bray.

O' Brien, B. (1991b) 'Old Bawn Road, Tallaght' in Bennett, I. (Ed.) *Excavations 1990,* Wordwell Ltd., Bray.
O' Keefe, T. (2000) 'Kiltatown House, Tallaght' in Bennett, I. (Ed) *Excavations 1999*, Wordwell Ltd., Bray.

Simington, R.C. (1945) *The Civil Survey, A.D. 1654-56*. Dublin.

Simms, A. and Fagan, P. (1992). 'Villages in Co. Dublin' in Aalen, F.H.A. and Wheelan, K. (ed.) *Dublin City and County: From Prehistory to Present*. Dublin.

Waddell, J. (1990) *The Bronze Age Burials of Ireland*, Galway University Press, Galway.

Walsh, C. (1998) St Melruan's, Tallaght in Bennett, I. (Ed.) *Excavations 1997*, Wordwell Ltd., Bray.

Online Resources

www.archaeology.ie

www.buildingsofireland.ie

www.dublincity.ie

www.excavations.ie

www.heritagemaps.ie

www.osimaps.ie

www.sdcc.ie

Google Earth

12.0 LANDSCAPE AND VISUAL AMENITY

12.1 Introduction

This chapter was prepared by Emma Oldroyd, BA Hons. (Land Arch) Leeds Beckett University; Post Grad Dip and MA in Landscape Architecture (Leeds Beckett University; CMLI; of Cunnane Stratton Reynolds Ltd (CSR). Emma has over 15 years' experience in landscape design, assessment and analysis in Ireland and the UK.

The Landscape and Visual Impact Assessment (LVIA) was informed by a desktop study and a survey of the site in Cookstown and receiving environment in South Dublin in May 2019 and revisited in May 2020. The report identifies and discusses the townscape and receiving environment in relation to a proposed development at Cookstown, Tallaght, Dublin.

The subject lands are approximately 4.994ha and span the north-west corner of First Avenue and Cookstown Road, Cookstown Industrial Estate, Dublin 24. Currently, the lands accommodate mainly light industrial uses with some offices and privately run fitness centres.

The development proposed on the subject lands is for 1104 residential units over 4 blocks of apartments with some commercial and community uses proposed.

12.2 Research Methodology

12.2.1 Definition of Landscape

Ireland is a signatory of the European Landscape Convention (ELC). The ELC 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'. This definition is important in that it expands beyond the idea that landscape in only a matter of aesthetics and visual amenity. It encourages a focus on landscape as a resource in it's own right – a shared resource providing a complex range of cultural, environmental and economic benefits to individuals and society.

As a cultural resource, the landscape functions as the setting for our day-to-day lives, also providing opportunities for recreation and aesthetic enjoyment and inspiration. It contributes to the sense of place experienced by individuals and communities and provides a link to the past as a record of historic socio-economic and environmental conditions. As an environmental resource, the landscape provides habitat for fauna and flora. It receives, stores, conveys and cleans water and vegetation in the landscape stores carbon and produces oxygen. As an economic resource, the landscape provides the raw materials and space for the production of food, materials (e.g. timber and aggregates) and energy (e.g. carbon-based fuels, wind, solar), living space and for recreation.

12.2.2 Forces for Landscape Change

Landscape in not unchanging. Many different pressures have progressively altered familiar landscapes over time and will continue to do so in the future, creating new landscapes. For example, within the receiving environment, the environs of the proposed development have altered over the last thousand years, from wilderness to agriculture and settlement or townscape.

Many of the drives for change arise from the requirement for development to meet the needs of a growing population and economy. The concept of sustainable development recognises that change must and will occur to meet the needs of the present, but that it should not compromise the ability of future generation to meet their needs. This involves finding an appropriate balance between economic, social and environmental forces and values.

Climate change is one of the major factors likely to bring about future change in the landscape and it is accepted to be the most serious long-term threat to the natural environment, as well as economic activity, (particularly primary production) and society. The need for climate change mitigation and adaption, which includes the management of water and more extreme weather and rainfall patterns, is part of this.

12.2.3 Guidance

Landscape and Visual Impact Assessment (LVIA) is a tool used to identify the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right an on peoples' views and visual amenity.

The methodology for assessment of the landscape and visual effects in informed by the following key guidance documents, namely;

- Guidance for Landscape and Visual Impact Assessment, 3rd Edition 2013, published by the UK Landscape Institute and the Institute of Environmental Management and Assessment (hereafter referred to as the GLVIA).
- Guidelines on the Information to be Contained in Environmental Impact Statements, 2002, published by the Environmental Protection Agency (and the Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports EIAR, 2017).
- South Dublin Development Plan 2016-2022
- Draft Tallaght Town Centre – Local Area Plan 2020-2026.
- Landscape Character Assessment of South Dublin County – Draft Report May 2015

Key Principles of the GLVIA

Use of the Term 'Effect' vs 'Impact'.

The GLVIA advises that the terms 'impact' and 'effect' should be clearly distinguished and consistently used in the preparation of an LVIA.

'Impact' is defined as the action being taken. In the case of the proposed development, the impact would include the construction of the buildings and associated infrastructure.

'Effect' is defined as the change or changes resulting from those actions, e.g. a change in landscape character, or changes to the composition, character and quality of views in the receiving environment. This report focuses on these effects.

Assessment of both 'Landscape' and 'Visual' Effects.

Another key distinction to make in a LVIA is that between landscape effects and the visual effects of development.

'Landscape' results from the interplay between the physical, natural and cultural components of our surroundings, whether urban or rural. Different combinations of these elements and their spatial distribution create distinctive character of landscape in different places. 'Landscape character assessment' is the method used in LVIA to describe landscape, and by which to understand the potential effects of a development on the landscape as 'a resource'. Character is not just about the physical elements and features that make up a landscape, but also embraces the aesthetic, perceptual and experiential aspects of landscape that make a place distinctive.

Views and *'visual amenity'* refer to the interrelationship between people and the landscape. The GLVIA prescribes that effects on views and visual amenity should be assessed separately from landscape, although the two topics are inherently linked. Visual assessment is concerned with changes that arise in the composition of available views, the response of people to these changes and the overall effects on the area's visual amenity.

This baseline and scoping study identifies the key landscape values and characteristics in the study area including key views and vistas and comments in terms of their capacity as constraints on development and their capacity to accommodate the proposed development.

12.2.4 Methodology for Landscape Assessment

In Section 12.5 of this report the landscape effects of the development are assessed. The nature and scale of changes to the landscape elements and characteristics are identified, and the consequential effect on landscape character and value are discussed. Trends of change in the landscape are taken into account. The assessment of significance of the effects takes account of the sensitivity of the landscape resource and the magnitude of change to the landscape which resulted from the development.

Sensitivity of the Landscape Resource

Landscape values can be identified by the presence of landscape designations or policies which indicate particular values, either on a national or local level. In addition, a number of criteria are used to assess the value of a landscape.

Landscape susceptibility is defined in the GLVIA as the ability of the landscape receptor to accommodate the proposed development without undue consequences for the maintenance of the baseline scenario and/or the achievement of landscape planning policies and strategies. Susceptibility also relates to the type of development – a landscape may be highly susceptible to certain types of development but have a low susceptibility to other types of development.

Sensitivity is therefore a combination of Landscape Value and Susceptibility.

For the purpose of this assessment, five categories are used to classify the landscape sensitivity of the receiving environment as presented in Table 12.1 below.

Sensitivity	Description
Very High	Areas where the landscape exhibits a very strong, positive character with valued elements, features and characteristics that combine to give an experience of unity, richness and harmony. The character of the landscape is such that its capacity for accommodating change in the form of development is very low. These attributes are recognised in landscape policy or designations as being of national or international value and the principle management objective for the area is protection of the existing character from change.
High	Areas where the landscape exhibits strong, positive character with valued elements, features and characteristics. The character of the landscape is such that it has limited/low capacity for accommodating change in the form of development. These attributes are recognised in landscape policy or designations as being of national, regional or county value and the principle management objective for the area is conservation of the existing character.
Medium	Areas where the landscape has certain valued elements, features or characteristics but where the character is mixed or not particularly strong or has evidence of alteration to / degradation / erosion of elements and characteristics. The character of the landscape is such that there is some capacity for change in the form of development. These areas may be recognised in landscape policy at local or county level and the principle management objective may be to consolidate landscape character or facilitate appropriate, necessary change.
Low	Areas where the landscape has few valued elements, features or characteristics and the character is weak. The character of the landscape is such that it has capacity for change; where development would make no significant change or would make a positive change. Such landscapes are generally unrecognised in policy and where the principle

	management objective is to facilitate change through development, repair, restoration or enhancement.
Negligible	Areas where the landscape exhibits negative character, with no valued elements, features or characteristics. The character of the landscape is such that its capacity for accommodating change is high; where development would make no significant change or would make a positive change. Such landscapes include derelict industrial lands or extraction sites, as well as sites or areas that are designated for a particular type of development. The principle management objective for the area is to facilitate change in the landscape through development, repair or restoration.

Table 12.1 Categories of Landscape Sensitivity

Magnitude of Landscape Change

The magnitude of change is a factor of the scale, extent and degree of change imposed on the landscape with reference to its key elements, features and characteristics (also known as 'landscape receptors'). Five categories are used to classify magnitude of landscape change.

Magnitude of Change	Description
Very High	Change that is large in extent, resulting in the loss of or major alteration to key elements, features or characteristics of the landscape and/or introduction of large elements considered totally uncharacteristic in the context. Such development results in fundamental change in the character of the landscape.
High	Change that is moderate to large in extent, resulting in major alteration to key elements features or characteristics of the landscape and/or introduction of large elements considered uncharacteristic in the context. Such development results in change to the character of the landscape.
Medium	Change that is moderate in extent, resulting in partial loss or alteration to key elements features or characteristics of the landscape, and/or introduction of elements that may be prominent but not necessarily substantially uncharacteristic in the context. Such development results in change to the character of the landscape.
Low	Change that is moderate or limited in scale, resulting in minor alteration to key elements features or characteristics of the landscape, and/or introduction of elements that are not uncharacteristic in the context. Such development results in minor change to the character of the landscape.
Negligible	Change that is limited in scale, resulting in no alteration to key elements features or characteristics of the landscape key elements features or characteristics of the landscape, and/or introduction of elements that are characteristic of the context. Such development results in no change to the landscape character.

Table 12.2 Categories of Landscape Change

Significance of Effects

In order to classify the significance of effects (both landscape and visual), the predicted magnitude of change is measured against the sensitivity of the landscape/viewpoint, using the following guide (see **Error! Reference source not found.**).There are seven classifications of significance, namely: (1) imperceptible, (2) not significant, (3) slight, (4) moderate, (5) significant, (6) very significant, (7) profound.

Sensitivity of the Landscape Resource

Magnitude of Change	Very High	High	Medium	Low	Negligible
Very High	*Profound*	*Profound-Very Significant*	*Very Significant-Significant*	*Moderate*	*Slight*
High	*Profound-Very Significant*	*Very Significant*	*Significant*	*Moderate-Slight*	*Slight-Not Significant*
Medium	*Very Significant-Significant*	*Significant*	*Moderate*	*Slight*	*Not Significant*
Low	*Moderate*	*Moderate-Slight*	*Slight*	*Not significant*	*Imperceptible*
Negligible	*Slight*	*Slight-Not Significant*	*Not significant*	*Imperceptible*	*Imperceptible*

Table 12.3 Guide to Classification of Significance of Landscape Effects

The matrix above is used as a guide only. The assessor also uses professional judgement informed by their expertise, experience and common sense, to arrive at a classification of significance that is reasonable and justifiable.

Landscape effects are also classified as positive, neutral or negative/adverse (See definitions in Section 11.2.6). Development has the potential to improve the environment as well as damage it. In certain situations, there might be policy encouraging a type of change in the landscape, and if a development achieves the objective of the policy the resulting effect might be positive, even if the landscape character is profoundly changed.

12.2.5 Methodology for Visual Assessment

In Section 12.5 of this report the visual effects of the development are assessed. Visual assessment considers the changes to the composition of views, the character of the views, and the visual amenity experienced by visual receptors.

Sensitivity of the Visual Resource

Value attached to views is determined by making judgements about the value attached to views experienced. Value can be determined by the existence of relevant policies or protected views or for example through the presence of visitor facilities provided at a particular viewpoint.

The susceptibility of visual receptors to change in the view is determined by the occupation or activity of people experiencing the view and the extent to which their attention is focused on the view.

Viewpoint sensitivity is therefore determined by combining of Value and Susceptibility.

For the purpose of this assessment, five categories are used to classify the landscape sensitivity of the receiving environment as presented in Table 12.4 overleaf.

The assessment

The assessment is made for a number of viewpoints selected to represent the range of visual receptors in the receiving environment. The significance of the visual effects experienced at these locations is assessed by measuring the viewpoint sensitivity against the magnitude of change to the view resulting from the development. Definitions of viewpoint sensitivity are provided below.

Sensitivity	Description
Very High	Viewers at iconic viewpoints – towards or from a landscape feature or area – that are recognised in policy or otherwise designated as being of high value or national value. This may also include residential viewers who are focused to a large extent on the view.
High	Viewers at viewpoints that that are recognised in policy or otherwise designated as being of value, or viewpoints that are highly valued by people that experience them regularly (such as views from houses or outdoor recreation features) and views which are highly valued by the local community. This may also include tourist attractions, and heritage features of regional or county value, and viewers travelling on scenic routes.
Medium	Viewers considered of medium susceptibility, such as locations where viewers are travelling at slow or moderate speeds through or past the affected landscape in cars or on public transport, where they are partly but not entirely focused on the landscape, or where the landscape has some valued views. The views are generally not designated, but which include panoramic views or views judged to be of some scenic quality, which demonstrate some sense of naturalness, tranquility or some rare element in the view.
Low	Viewers at viewpoints reflecting people involved in activities not focused on the landscape e.g. people at their place of work or engaged in similar activities such as shopping, etc. The view may present an attractive backdrop to these activities but there is no evidence that the view is valued, and not regarded as an important element of these activities. Viewers travelling at high speeds (e.g. motorways) may also be generally considered of low susceptibility.
Negligible	Viewpoints reflecting people involved in activities not focused on the landscape e.g. people at their place of work or engaged in similar activities such as shopping where the view has no relevance or is of poor quality and not valued.

Table 12.4 Categories of Viewpoint Sensitivity

Magnitude of Change to the View

Classification of the magnitude of change takes into account the size or scale of the intrusion of development into the view (relative to the other elements and features in the composition, i.e. its relative visual dominance), the degree to which it contrasts or integrates with the other elements and the general character of the view, and the way in which the change will be experienced (e.g. in full view, partial or peripheral, or glimpses). It also takes into account the geographical extent of the change, the duration and the reversibility of the visual effects.

Five categories are used to classify magnitude of change to a view:

Magnitude of Change	Description
Very High	Full or extensive intrusion of the development in the view, or partial intrusion that obstructs valued features or characteristics, or introduction of elements that are completely out of character in the context, to the extent that the development becomes the dominant composition and defines the character of the view and the visual amenity.
High	Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features, or introduction of elements that may be considered uncharacteristic in the context, to the extent that the development becomes co-dominant with other elements in the composition and affects the character of the view and the visual amenity.
Medium	Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context, resulting in change to the composition but not necessarily the character of the view or the visual amenity.
Low	Minor intrusion of the development into the view, or introduction of elements that are not

	uncharacteristic in the context, resulting in minor alteration to the composition and character of the view but no change to visual amenity.
Negligible	Barely discernible intrusion of the development into the view, or introduction of elements that are characteristic in the context, resulting in slight change to the composition of the view and no change in visual amenity.

Table 12.5 Categories of Visual Change

Significance of Visual Effects

As for landscape effects, in order to classify the significance of visual effects, the magnitude of change to the view is measured against the sensitivity of the viewpoint, using the guide in Table 12.5 above.

12.2.6 Quality and Timescale

The predicted impacts are also classified as beneficial, neutral or adverse. This is not an absolute exercise; in particular, visual receptors' attitudes to development, and thus their response to the impact of a development, will vary. However, the methodology applied is designed to provide robust justification for the conclusions drawn. These qualitative impacts/effects are defined as:

- Adverse – Scheme at variance with landform, scale, pattern. Would degrade, diminish or destroy the integrity of valued features, elements or their setting or cause the quality of the landscape(townscape)/view to be diminished;
- Neutral - Scheme complements the scale, landform and pattern of the landscape(townscape)/view and maintains landscape quality;
- Beneficial – improves landscape(townscape)/view quality and character, fits with the scale, landform and pattern and enables the restoration of valued characteristic features or repairs / removes damage caused by existing land uses.

Impacts/effects are also categorised according to their longevity or timescale:

- Temporary – Lasting for one year or less;
- Short Term – Lasting one to seven years;
- Medium Term – Lasting seven to fifteen years;
- Long Term – Lasting fifteen years to sixty years;
- Permanent – Lasting over sixty years.

A statement is made as to the appropriateness of the proposed development based on the combined assessment of the predicted landscape and visual effects. This methodology, in accordance with the various guidelines for LVIA, results in a conclusion as to the appropriateness of the proposed development based on objective assessment of its likely landscape and visual impacts.

12.2.7 The Proposed Development

The development is described in Section Two of the EIAR and also in the accompanying Design Statements. Those elements that have landscape and visual impacts include the;

- Construction of 5 new mixed-use blocks, ranging in height between 4 and 11 storeys – and all associated infrastructure.
- Proposed materials for the architecture which include brick, render and coloured aluminium cladding with slate roofs and integrated roof gardens.
- Construction of 4 new podium semi-private courtyards and 4 new semi-private roof gardens.

- Construction and planting of all new plazas, parks, habitat areas, public open spaces, swales and play facilities increasing diversity, accessibility and connectivity.
- Construction of a crèche in Block C2 which will have its own play area.
- Construction of all associated internal roads, parking, cycleways and pedestrian pathways
- New tree and shrub planting throughout the development.
- Hedgerows to be removed to facilitate the development and which need to be removed due to poor condition.
- Construction of 4 attenuation tanks throughout the development.

12.3 Receiving Environment

This section is divided into a review of landscape related Planning Policy as set out in the South Dublin Development Plan 2016-2022 and associated documents, and a description of the study areas informed by desktop assessment.

12.3.1 Relevant Planning Policy

The **South Dublin Development Plan 2016-2022** is reviewed in this section, in terms of relevance to the site location and the proposed development.

South Dublin Development Plan 2016-2022

The South Dublin Development Plan 2016-2022 *(SDDP)* contains a range of policies relevant to establishing the landscape and visual values and sensitivities for the site and site environs, guiding the appropriate design and mitigation of impacts for the proposed development. These are set out below;

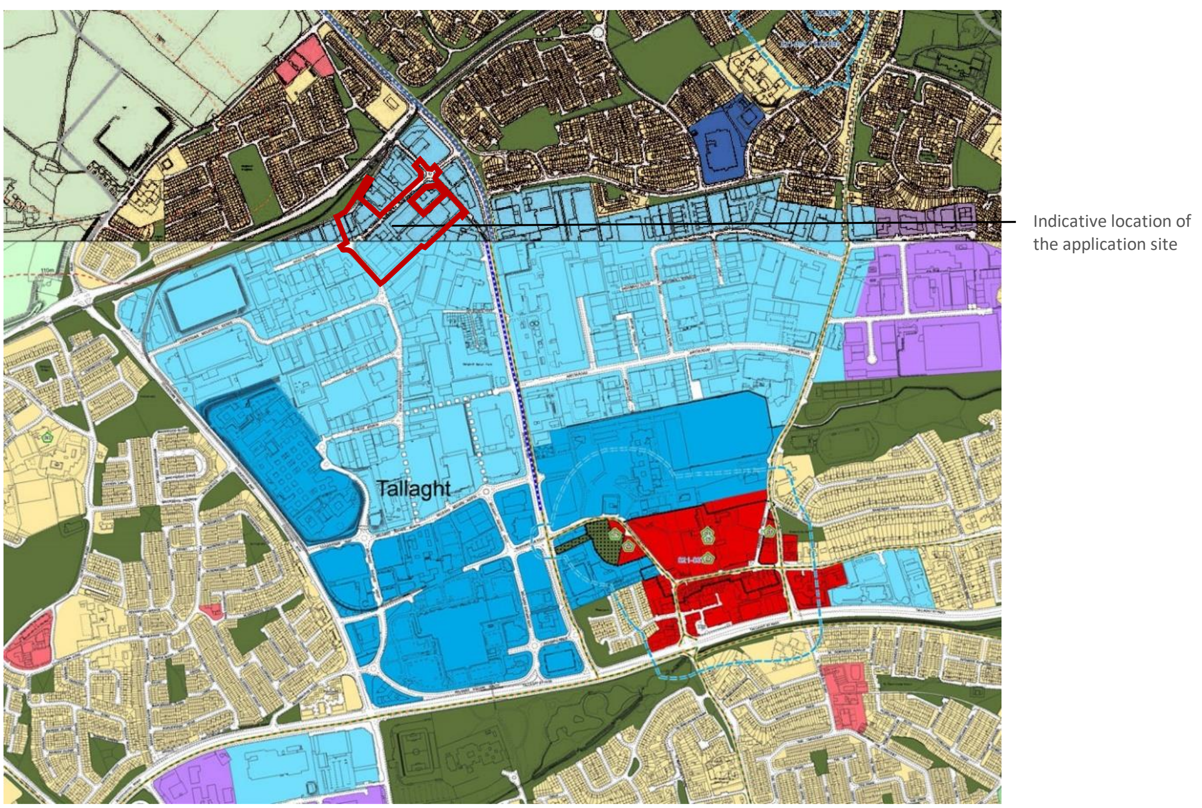


Figure 12.1 Extract of Zoning Map South Dublin Development Plan 2016-2022, detail location of proposed development highlighted in red).

Objective

TC: To protect, improve and provide for the future development of town centre.

REGEN: To facilitate enterprise and/or residential-led regeneration.

DC: To protect, improve and provide for the future development of District Centres.

LC: To protect, improve and provide for the future development of Local Centres.

RES: To protect and/or improve residential amenity.

RU: To protect and improve rural amenity and provide for the development of agriculture

OS: To preserve and provide for open space and recreational amenities.

Zoning

The application lands are zoned under the 'Regeneration' objective which aims to, "*facilitate enterprise and /or residential-led regeneration"*.

To the north-west of the application site, between the site boundary and the LUAS, there are lands zoned as 'Open Space' which aims to, "*preserve and provide for open space and recreational amenities"*.

The following information is in relation to SDDP OS zoning and is relevant to the proposed development, as 'Parcel 1' of the site sits adjacent to Open Space.

- In Chapter 11 – Implementation, 11.1.0 Land Use Zoning, SDDP, states that under OS zoned lands the following relevant classes of development (of relevance to this proposed development) are permitted in 'principle' include; *Open Space and Recreation Facility.*
- In Chapter 11 – Implementation, 11.1.0 Land Use Zoning, SDDP, states that under OS zoned lands the following relevant classes of development (of relevance to this proposed development) that are 'Open for Consideration' include; *Childcare facilities, Residential and Restaurant/Café.*

Housing

The SDDP makes reference to the National Housing Policy Statement, DECLG (2011), which states *'to enable each household to have access to good quality housing that is appropriate to its circumstances and in a community of it's choice'*. The SDDP states that new housing shall be delivered through sustainable intensification whilst respecting the amenity value of existing public open spaces. South Dublin is predominantly an urban county and the SDDP states core objectives and criteria for its future housing needs.

- In Chapter 2 – Housing, 2.2.1 Supply of Housing, SDDP, states the need for *'sustainable intensification and redevelopment on REGEN zoned lands'* to reach a capacity for approximately 40,150 housing units in the County by 2022.

- In Chapter 2 – Housing, 2.2.1 Sustainable Neighbourhoods, SDDP, states *'H7 Objective 2: To ensure that residential development provides an integrated and balanced approach to movement, place-making and streetscape design in accordance with the requirements of the Design Manual for Urban Road and Streets, DTTAS and DEHLG (2013)'.*

- In Chapter 2 – Housing, 2.2.1 Sustainable Neighbourhoods, SDDP, states *'H7 Objective 1: To ensure that residential development contributes to the creation of sustainable communities in accordance with the requirements of the Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas, DEHLG (2009) including the urban design criteria as illustrated under the Urban Design Manual – A Best Practice Guide, DEHLG (2009).*

- In Chapter 2 – Housing, 2.2.2 Residential Densities, SDDP, states *'H8 Objective 2: To consider higher residential densities at appropriate locations that are close to Town, District and Local Centres and high capacity public transport corridors.*

- In Chapter 2 – Housing, 2.2.2 Residential Densities, SDDP, states *'H8 Objective 4: To support proposals for more intensive enterprise and/or residential led development within areas designated with Zoning Objective 'REGEN'.*

- In Chapter 2 – Housing, 2.2.3 Residential Building Height, SDDP, states *'H9 Objective 1: To encourage varied building heights in new residential development to support compact urban form, sense of place, urban legibility and visual diversity.*

- In Chapter 2 – Housing, 2.2.3 Residential Building Height, SDDP, states *'H9 Objective 4: To direct tall buildings that exceed five storeys in height to strategic and landmark locations in Town Centres and approved Local Area Plans.*

- In Chapter 2 – Housing, 2.3.2 Public Open Space, states *'H12 Objective 2: To ensure that there is a clear definition between public, semi-private and private open space at a local and district level and that all such open spaces benefit from passive surveillance from nearby residential development.*

- Section 2.3.3 Private and Semi-Private Open Space, SDDP, states *'H13 Objective 2: To ensure that new apartment have access to high quality and integrated semi-private open space that supports a range of active and passive uses.*

Community Infrastructure

The planned provision of accessible community and recreational facilities of relevance to landscape and assessment, include parks, opens spaces and plazas. The SDDP illustrates the strategic provision of these amenities to foster and encourage sustainable communities.

The following is set out in Chapter 3 of the SDDP in relation to Community Infrastructure and is relevant to the proposed development.

- Section 3.9.0, Sports Facilities & Centres, states *'C7 Objective 1: To support the provision of new or improved sports and leisure facilities in the County'.*
- Section 3.13.0, Open Space Management & Use, states *'C12 Objective 1: To support a hierarchy of open space and recreational facilities based on settlement size and catchment.*
- Section 3.13.0 Open Space Management & Use, states *'C12 Objective 3: To develop parks and open/green spaces that cater for the diverse needs of the County's population, in particular different age groups and abilities, through the facilitation of both active and passive recreational activities and universal access'.*

Urban Centres & Retailing

Under the SDDP 2016-2022, it is the aim of the council to enhance and develop the fabric of development urban centres in accordance with the principles of good urban design and sustainable development. Under the development plan there is an encouragement for development densities that will promote vibrant communities.

The following is set out in Chapter 5 of the SDDP in relation to Urban Centres and is relevant to the proposed development.

- Urban Centres & Retailing, 5.1.0 Urban Centres, states *'UC 1 Objective 4: To promote a high standard of urban design in urban centres that contributes to the creation of safe and attractive* *streets and spaces and creates desirable places to work, live and visit.*

- Chapter 5 – Urban Centres & Retailing, 5.1.5 Building Height in Urban Centres, states *'UC6 Objective 1: To encourage varied building heights in town, district, village, local and regeneration areas to support compact urban form, sense of place, urban legibility and visual diversity while maintaining a general restriction on the development of tall buildings adjacent to two-storey housing'.*

Transport & Mobility

Under the SDDP 2016-2022 it is the policy of the council to support the enhancement of public-transport links in tandem with the sustainable development of mixed-use residential areas.

The following is set out in Chapter 6 of the SDDP in relation to Transport & Mobility and is relevant to the proposed development.

- *'TM6 Objective 2: To ensure that all streets and street networks are designed to passively calm traffic through the creation of a self-regulating street environment'.*

Infrastructure & Environmental Quality

In relation to landscape assessment the SDDP 2016-2022 sets out it's policies in relation to the protection, enhancement, management and safeguarding of surface water.

The following is set out in Chapter 7 of the SDDP in relation to Infrastructure & Environmental Quality and is relevant to the proposed development.

- '*IE2 Objective 3; To maintain and enhance existing surface water drainage systems in the County and to promote and facilitate the development of Sustainable Urban Drainage Systems (SUDS), including integrated constructed wetlands, at a local. District and County level, to control surface water outfall and protect water quality'.*
- *'IE2 Objective 4: To incorporate Sustainable Urban Drainage Systems (SUDS) as part of Local Area Plans Planning Schemes, Framework Plans and Design Statements to address the potential for Sustainable Urban Drainage at a site and/or district scale, including the potential for wetland facilities'.*
- *'IE2 Objective 5: To limit surface water run-off from new developments through the use of Sustainable Urban Drainage Systems'.*

Green Infrastructure

The SDDP describes green infrastructure as *'an interconnected network of waterways, wetlands, woodlands, wildlife habitats, greenways, parks and conservation lands, forests and other open spaces that adjoin and area threaded through urban areas'.*

The Plan notes that the County's Green Infrastructure network comprises an interconnected network of green spaces that possess a broad range of ecological elements including inter alia: core areas such as the County's three Natura 2000 sites; proposed Natural Heritage Areas (pNHA), the Liffey Valley, Dodder River Valleys and the Grand Canal; and individual elements such as watercourses, parks, hedgerows/ tree-lines and sustainable drainage features in park lands.

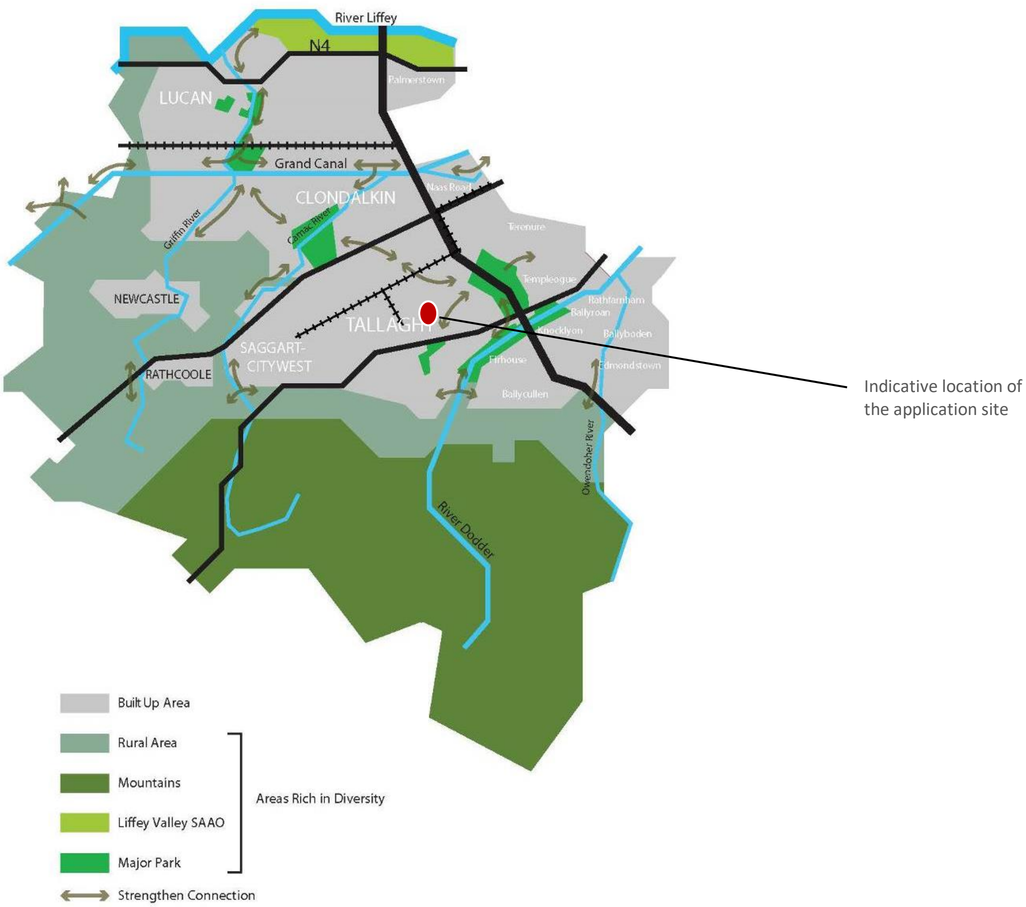


Figure 12.2 South Dublin County Council Strategic Green Infrastructure network

The following objectives are set out in Chapter 8 of the SDDP in relation to Green Infrastructure and is relevant to the proposed development;

- 'G1 Objective 1: *To establish a coherent, integrated and evolving Green Infrastructure network across South Dublin County with parks, open spaces, hedgerows, grasslands, protected areas and rivers and streams forming the strategic links and to integrate the objectives of the Green Infrastructure Strategy throughout all relevant Council plans, such as Local Area Plans and other approved plans'.*
- 'G2 Objective 1: *To reduce fragmentation of the Green Infrastructure network and strengthen ecological links between urban areas, Natura 2000 sites, proposed Natural Heritage Areas, parks and open spaces and the wider regional Green Infrastructure network.*
- 'G2 Objective 5: *To integrate Green Infrastructure as an essential component of all new development'.*
- 'G2 Objective 11: *To incorporate appropriate elements of Green Infrastructure e.g. new tree planting, grass verges, planters etc. into existing areas of hard infrastructure wherever possible'.*
- 'G4 Objective 1: *To support and facilitate the provision of a network of high quality, well located and multifunctional public parks and open spaces throughout the County and to protect and enhance the environmental capacity and ecological function of these spaces'.*
- 'G4 Objective 2: *To connect parks and areas of open space with ecological and recreational corridors to aid the movement of biodiversity and people and to strengthen the overall Green Infrastructure network'*
- 'G4 Objective 3: *To enhance and diversify the outdoor recreational potential of public open spaces*

and parks, subject to the protection of the natural environment'.

- 'G5 Objective 1*: To promote and support the development of Sustainable Urban Drainage Systems (SUDS) at a local, district and county level and to maximise the amenity and biodiversity value of these systems'.*
- 'G5 Objective 2: *To promote the provision of Green Roofs and/or Living Walls in developments where expansive roofs are proposed such as industrial, retail and civic developments.'*
- 'G6 Objective 1*: To promote and enhance existing ecological feature including tree stands, woodland, hedgerows and watercourses in all new development as an essential part of the design process'.*
- 'G6 Objective 2*: To require new development to provide links into the wider Green Infrastructure network, in particular where similar features exist on adjoining sites.'*
- 'G6 Objective 3: *To require multifunctional open space provision within all new developments that includes provision for ecology and sustainable water management.'*
- In Chapter 8 – Green Infrastructure, *'G6 Objective 2: To require new development to provide links into the wider Green Infrastructure network, in particular where similar features exist on adjoining sites'.*
- 'G6 Objective 3*: To require multifunctional open space provision within all new development that includes provision for ecology and sustainable water management'.*

Heritage, Conservation & Landscapes

The SDDP chapter on Heritage, Conservation and Landscapes sets-out a range of policies and objectives to protect and conserve the built, cultural and natural heritage of the county. With regards to the proposed development, there are no protected monuments, archaeology or built heritage affected by the development.

A Landscape Character Assessment of South Dublin was completed in 2015. The proposed site is located in *'Landscape Character Area 5 - Suburban South Dublin'*. The built-up nature of the area is noted and the presence of major transport routes, housing areas, grassy spaces, industrial areas and parks, as well as the backdrop of rural and upland views. In general prospects of the Dublin Mountains are to be preserved however no specific viewpoints or scenic routes are identified in close proximity to or with any relevance to the site. The site itself is located approximately 3km from the foothills of the Dublin Mountains.

The views out to the Dublin Mountains and rural hinterland are of particular importance here. Key mitigation measures cited in the write up of the character area are that;

- *Grassland and other amenity area open spaces should be managed for the dual benefits of public access and biodiversity.*
- *Tree and shrub planting should be an integral component of amenity grasslands (schools recreational grounds, golf courses and playing fields).*
- *The development of green infrastructure to connect different habitats within the urban context.*
- *Tree planting on streets and open spaces – particularly on 'miscellaneous 'open space in housing areas- to improve their character.*
- *Enhance connectivity between open spaces as a means of enhancing biodiversity while providing off road connections for pedestrian and cyclists.*
- *Proposed developments should be audited for their impact on views particularly those to the rural hinterland of the county* (2015 p.90).

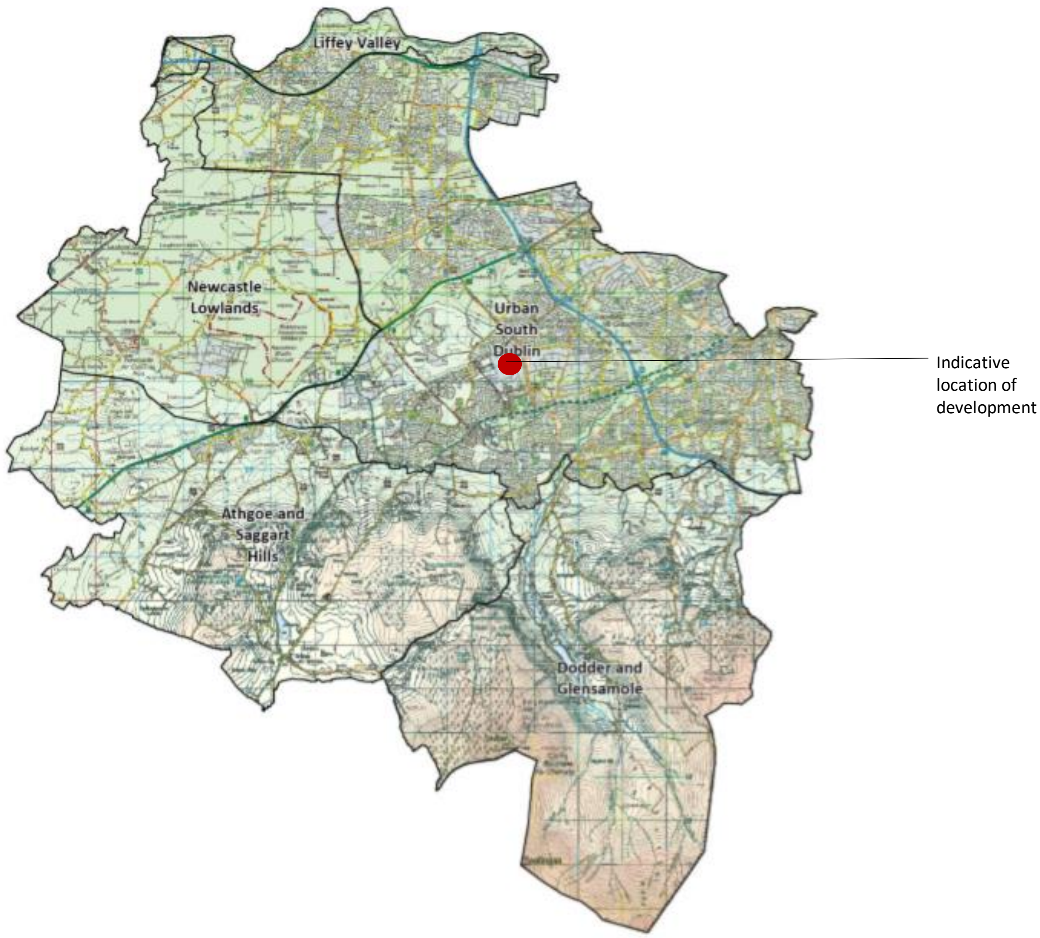


Figure 12.3 South Dublin Landscape Character Areas.

Tallaght Town Centre – Local Area Plan 2020-2026

In July 2020 the Tallaght Town Centre – Local Area Plan 2020-2026 was published.

The purpose of the Local Area Plan (LAP) is to provide a strategic framework for the sustainable development of Tallaght Town Centre. This LAP seeks to deliver high quality housing and well-connected neighbourhood areas with a strong sense of community and social cohesion. It seeks to promote prosperity and opportunity in terms of employment, economic development and tourism, while ensuring the conservation and enhancement of green infrastructure and built heritage.

Indicative location of the application site

Figure 12.4 Extent of LAP area

The LAP sets out a number of overarching objectives:

- Deliver a quality built environment: Create a built form that will shape the future spatial development of Tallaght Town Centre, while fulfilling the future potential of the Town Centre using best practice urban design principles.
- Deliver a network of connected neighbourhoods: To provide a vision for each of the neighbourhood areas and provide guidance on future building form in these areas, in terms of land use, building frontage, access and movement, green infrastructure and building height.
- Promote Tallaght's role as the Capital of the County: To maintain Tallaght's pivotal role in ensuring that South Dublin County maintains a strong and diverse economic base in terms of employment, retailing, transportation, industry and professional/financial services and to ensure Tallaght will enhance and contribute to the County through investment in the tourism, entertainment and leisure sectors.
- Deliver sustainable residential communities: To strengthen Tallaght's appeal in terms of residential and community facilities and ensure the balanced provision of residential tenures, community facilities and services for the existing and future residents in order to promote health and wellbeing, social inclusion and quality of life.
- Respect and promote our heritage and architectural features: To recognise and protect Tallaght's heritage and cultural identity attributes in terms of Archaeological Heritage, Protected Structures, Architectural Conservation Areas and the integration of new development.
- Proactively plan for climate change: To realise the importance of existing and future green infrastructure provision and sufficient open space for the future population and to ensure that the landscape of Tallaght continues to contribute to its identity into the future, while having the potential to play a major role in climate change adaptation and flood risk measures.

- Implementation: To provide clear guidance on the implementation of policies and objectives of the Local Area Plan.

The LAP sets out an Urban Structure for the area and divides the area into a series of distinctive new neighbourhoods, each with its own design objectives and guidance. The application site falls within the Cookstown area.

Cookstown forms its own distinctive neighbourhood within the LAP and will see the current industrial charcater change to "*An attractive mixed use residential neighbourhood with distinctive urban qualities and high levels of access to public transport and the urban centre".*

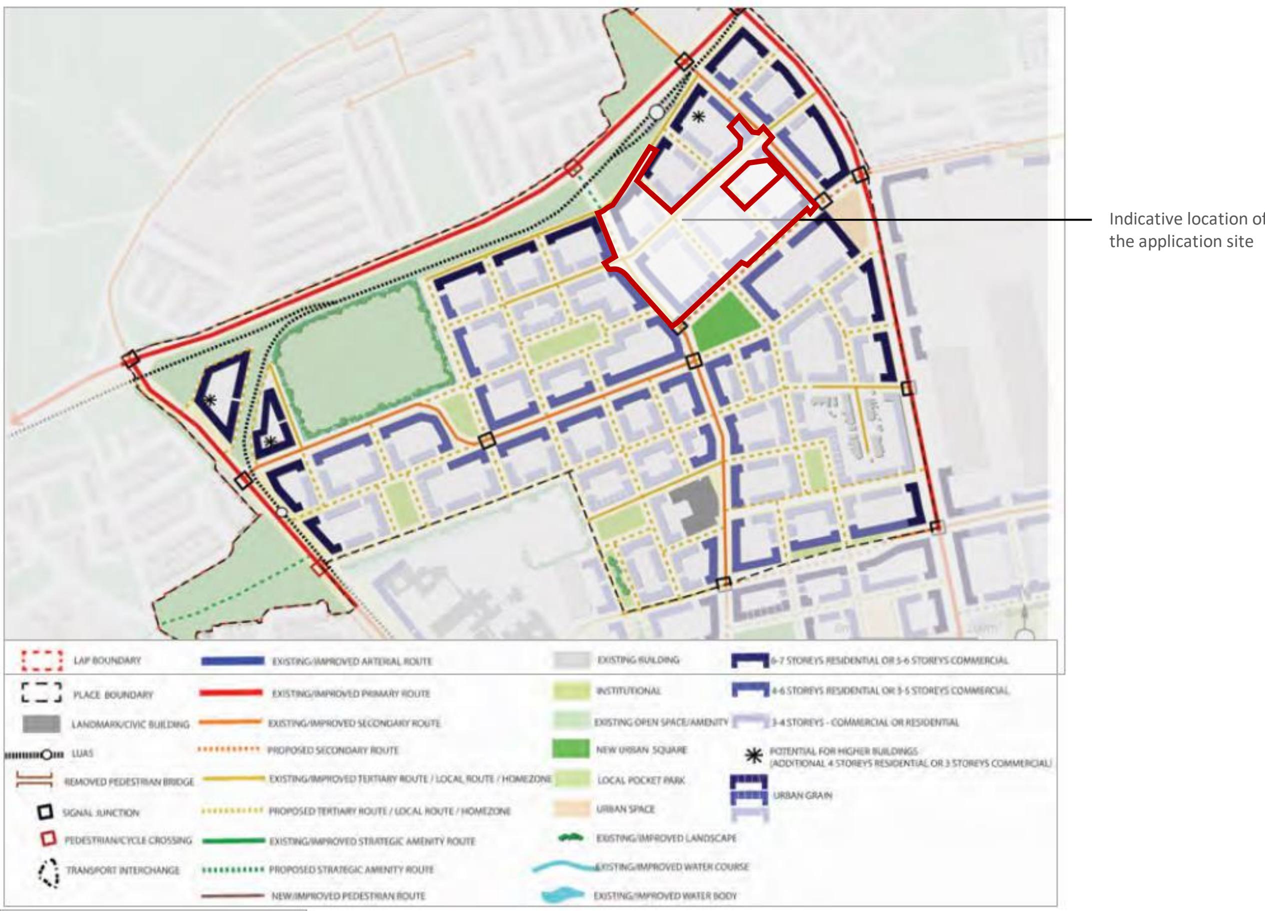


Figure 12.5 Excerpt from Tallaght LAP 2020-2026

Relevant Key Objectives for Cookstown (CK):

- CK1: Emergence of a vibrant mixed use residential neighbourhood.
- CK2: Create new urban block structure.
- CK4: Improve legibility throughout the area and provision of new streets linking to nearby hubs and The Centre.
- CK5: Delivery of a variety of building types around Luas stops*.*

Guidance as to building height is provided as follows:

- Primary Frontage – 6-7 storeys + 1 recessed fpr residential. 6-6 storeys + 1 recessed for non-residential.
- Secondary Frontage – 4-6 storeys residential, 3-5 storeys noon-residential
- Other frontages – 3-4 storeys non-residential
- Landsmark Buildings – Belgard and Coostown LUAS stps

The Chief Executives report on Public Consultation in December 2019 stated that "*The proposed urban structure is a guide for future development in the area and is not intended to be rigidly adhered to. Flexibility in relation to the proposed urban structure will be considered where it is demonstrated that the overarching objectives of the urban framework and key elements of the proposed urban structure are achieved in any alternative layout."*

Summary of Planning Policy and Objectives

- The site is located within 500m catchment of a LUAS stop.
- The site is zoned for REGEN – residential-led regeneration and supports the development of the lands, '*to facilitate enterprise and/or residential-led regeneration',* SDDP 2016-2022.
- The potential of the land to deliver high-density and high-rise residential development
- The potential to contribute towards the deliver of LAP vision and objectives such as;
    - Delivery of 3,000-5,000 homes
    - Provision of cycling and pedestrian links
    - Creation of network of public open spaces.

12.3.2 Description of Receiving Environment

The Existing Site

The site and its environs are described below in terms of:

- Location
- Site and Immediate environs
- Land Use
- Topography
- Built and Cultural Heritage;
- Access
- Landscape character;
- Landscape and visual amenity;
- Landscape Value and Susceptibility
- Visibility

Location

The site is located in Cookstown, Tallaght, north-west of Tallaght village and is located along Cookstown Road at the intersection with First Avenue. The proposed development is approximately 100 meters from Belgard Luas Station, local shops and the Katherine Tynan collector road which links Ballymount and the Citywest Business Campus.

Public services such as South Dublin County Council, Library, Civic Theatre and other public spaces are located approximately 800m to the south. Local regional parks are Sean Walsh Memorial Park (located approximately 1.2kms to the south), Kilnamanagh Park (located approximately 500m to the north-east) and Bancroft Park (located approximately 1.1km to south-east).

The existing regional parks at Sean Walsh Park and Bancroft Park have attractive landscaping and facilities to provide for a wide range of active and passive recreational activities, including sporting infrastructure such as an athletics field (Bancroft Park) and Tallaght Stadium (Sean Walsh Park). There is a children's playground at Sean Walsh Park and Kilnamanagh Park.

Figure 12.6 Site Location and Context. (Curtesy of Imagery@2019Google Map Data)

The Site and Immediate Environs

The application lands are currently occupied with premises for a mix of uses including light-industry, offices and indoor sports (such as gymnastics and skateboarding). The lands span Cookstown Road and take in parts of Old Belgard Way. There are views of the Dublin Mountains to the south visible along Cookstown Road and between buildings.

To the north of Cookstown Road, the lands comprise a two-storey unit with an asphalt hardstanding area. The boundary to Cookstown Road is a low blockwork wall with timber panel fencing along all other edges. To the north-west of the site there several mature trees and a mature native hedgerow along the boundary perimeter, which is likely to provide valuable habitat for biodiversity. Adjacent to the north-western site boundary there is a metalled access road leading towards Belgard Station, which has the potential to provide a direct future connection. The land then rises steeply towards a pylon which is sited on a mounded grassy meadow containing wildflowers and plants. Together with the mature hedgerow, the mounded land prevents passive surveillance from surrounding buildings, roads and the LUAS. There is evidence of fly tipping there.

Plate 1. View North-East from Cookstown Road North

Plate 2. View North from Cookstown Road North

Plate 3. View South-west from the end of Belgard

Plate 4. View North-East from the northern site boundary

The lands south of Cookstown Road consist of several two-three storey premises. The boundaries consist of brick-walls with heavy, black, rusting and sometimes chained bollards along Cookstown Road, which itself has high kerbs of industrial proportions. The remaining boundaries differ across the site. The boundaries around the four-storey office building north of the application lands and the dark grey brick wall on Old Belgard Road are the only boundaries that are likely to remain unchanged as part of this application.

Plate 5. View South from Cookstown Road intersection with First Avenue

Plate 6. View Southwest along Cookstown Road

Plate 7. View North along Cookstown Road

Plate 8. View North Through the site across the PFS

Plate 8. View south-east between the PFS and existing office building (off-site)

Plate 9. View south-east along the south-east access road into the site

There is a fuel station located on the Old Belgard Road and within the site boundary. Between the fuel station and the office building (off-site) there is an access road and then a high concrete rendered wall separating the site from a driveway leading to an underground office carpark. The ground level of the south-eastern façade of this building is located approximately 1.5m above the access road north of the fuel station. There is a row of mixed mature trees further along this boundary. To the south of the fuel station in the adjacent lands, there is a row of mature Aspens. Within the site itself, metal palisade fences separate plots.

In summary, the site presents many opportunities for change in the move towards creating a new Tallaght. The views towards the Dublin Mountains and potential direct links to the LUAS should be maximised. Constraints and sensitivities are minimal and are limited to the existing pylon and existing mature trees. The existing hedgerow and the ecological richness of the mound have the potential to be replaced. There is there is little or no topsoil on the site and poor-quality subsoil.

Land Use

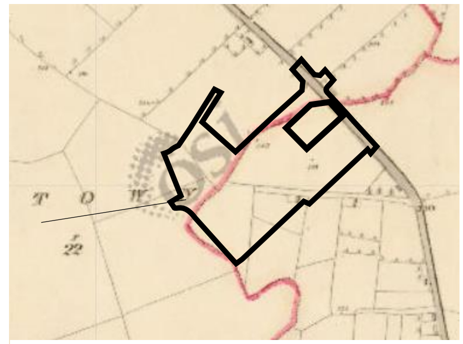
The application lands are currently occupied with premises for a mix of uses including light-industry, offices and indoor sports (such as gymnastics and skateboarding). The lands span Cookstown Road and take in parts of Old Belgard Way. There is a fuel station located on the Old Belgard Road and within the site boundary.

Topography

The land falls gradually from the north-west of the site boundary to the south-east. There are some minor variances within the site with raised grass and shrub areas. There are some very high, industrial scale kerbs along existing roads. To the north east of the site, there is a raised mound between the site boundary and Katherine Tynan Road and then the land rises further still to Belgard Heights. Views towards the site from Belgard Heights are considered in this assessment.

Built and cultural heritage

There are no historical or cultural features present on the site and no recorded monuments present. Cookstown Road approximately follows an old townland boundary, which is discernible when overlaying the site boundary onto the Ordnance Survey 1st edition six-inch map, 1843.



Indicative location of development

Figure 12.7 Ordnance Survey 1st edition six-inch map, 1843

Landscape and visual amenity

The site is visible from a close-range to the east, west and south of the development lands and along adjacent roads. From the slopes to the north, the application lands are visible in some views as a backdrop to the existing LUAS station, pylons, boundary structures and hedgerows.

From the site itself, the only notable views are;

- Glimpses south towards the Dublin between existing buildings and at key junctions – looking South along existing roads.
- Views north-west towards the existing pylon and trees located to the north-west of the site.

A detailed description of visual influence and the views themselves will be provided in the full Landscape and Visual Impact Assessment.

Landscape Character

Site Context

The character of the Cookstown Industrial Estate includes a mix of light industrial, recreational and office uses with industrial sized buildings ranging between approximately 1 and 6 stories high. This industrial character continues west over the Belgard Road between Kilnamanagh and TU Dublin and associated educational lands.

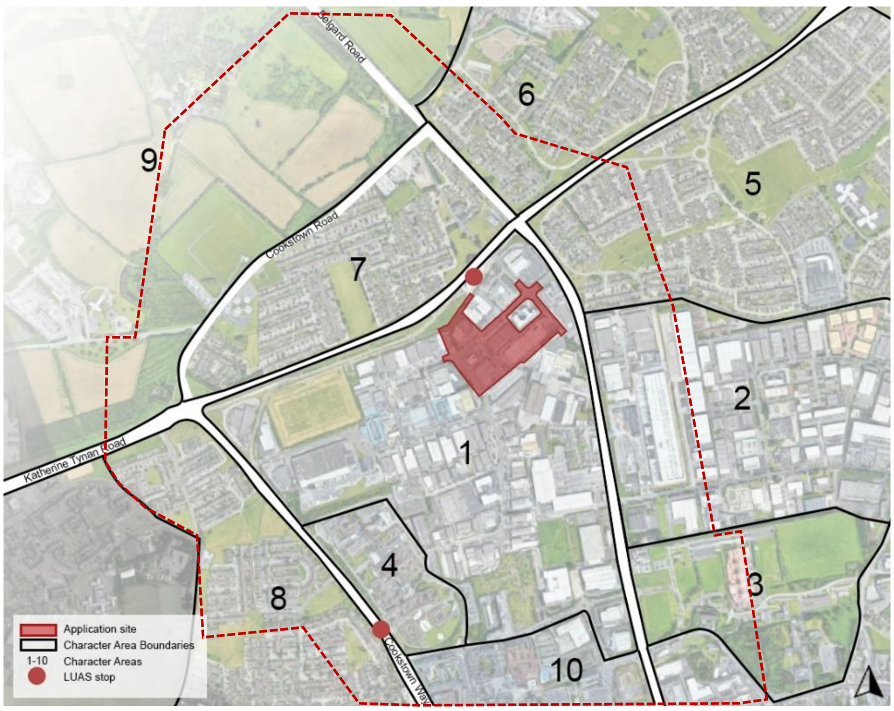
There are four areas to the north as west of Cookstown which have a suburban character with predominantly two-storey residential buildings with scattered grassed open spaces, shops, schools and community buildings. There are some street and parkland trees present. North of Katherine Tynan Road, the land rises towards Kingswood. Further North, the hilly hinterland of Dublin separates Tallaght from Newlands Cross and Clondalkin. Remnant woodland, agricultural fields, a quarry and a golf course all exist here. Tallaght town centre, to the south of Cookstown is the most mixed area in terms of land use, in contrast to the other landscape character areas described, which are predominantly single use. This new urban town centre is high density and has adopted a contemporary style of architecture with well-defined public plazas. Associated with the Town Centre is Tallaght University Hospital, located to the south-west.

Although much of Tallaght is perceived as the extensive suburbs and industrial areas developed around the village from the 1960's onwards, the core historical village is still present and legible and has been enhanced by recenbt heritage initiatives. The village dates back to the foundation of St Maelraun's monastery in 769 AD, and consists of a cluster of vernacular buildings around a triangular road junction close to the historic remains of the monastery which in the 19th Century became St Mary's Abbey. This part of Tallaght maintains a distinctive heritage character with its limestone walls and mature trees.

The modern Technological University Tallaght was established on lands north of St Mary's Priory and bordering Belgard Road, thus extending and emphasising the institutional and educational land use in this area dating back to the original monastery. The modern campus reflects and attractive parkland character with contemporary buildings.

Cookstown Industrial Area

Cookstown Industrial Area consists of a mix of light industrial, recreational and office uses with industrial sized buildings ranging between approximately 1 and 6 stories high. The surfaces are predominantly hard and there are very few valuable landscape features except for a few playing pitches and some distinct rows of mature trees. Streets all have the same width and hierarchy and have the same high, carriage kerbs to prevent parking on pavements. The quality and style of the buildings is functional, and materiality is changeable, functional and incoherent. There are many barriers and boundaries which prevent permeability through blocks. There are good vies to the Dublin Mountains looking south along streets.



Character Areas
1. Cookstown Industrial Estate
2. Broomhill Industrial Estate
3. Tallaght University and educational lands
4. Tallaght university hospital
5. Kilnamanagh
6. Kingswood Heights
7. Belgard Heights
8. Springfield
9. Kingswood hinterlands
10. Tallaght Town Centre.

Site context character area.

Figure 12.8 Site Context and Local Landscape Character Areas (Curtesy of Imagery@2019Google Map Data)

Subject Lands

The landscape character of the subject lands is of an industrial urban landscape. It is defined by its;

- Existing, generally low-rise buildings of an industrial footprint and generic style and materiality
- Use of bold colours associated with different companies
- The existing petrol filling station which is well-used.
- Relationship with Cookstown Road, which runs adjacent and through the site and is industrial in character, and Old Belgard Road, which traverses the north-eastern edge of the site and is more commercial in character with wider pavements.
- Proximity to the LUAS and Tallaght Town Centre which represents the potential townscape character achievable here.

- The existing industrial streetscape treatment of Cookstown Road, with its high kerbs and black, chained bollards which discourage access and permeability.
- Series of access roads cutting into the centre of the site - but in general, very limited access and permeability due to private ownership and boundaries
- Functional boundary treatments that range in generic styles and types.
- Extensive areas of hard-standing surfaces.
- Very limited vegetation present on the site itself and that in existence has been planted and is of low quality.
- Proximity to the lands between the north-western site boundary and the LUAS, which are zoned as Open Space and contain some mature trees, a native hedgerow and grassland communities – although have no features or facilities present except for an access road surfaced in poor quality tarmac. There has been fly-tipping along the access road.
- Proximity to existing pylons which are visual focal points – urban as they area in character.
- Proximity to existing rows of trees which are visible over the existing buildings and suggest urban structure.
- Gradually sloping topography from the north-west down to the south-east.
- Views south to the Dublin Mountains.

There are very few valued elements present in the industrial landscape at present except for;

- the successful petrol filing station
- the existing views south to the Dublin Mountains; and,
- the potential to take inspiration from the colour palettes and industrial character present.

In general, there are very few valued elements, features or characteristics present within the subject lands and the character is generic and of poor quality. The character of the landscape is such that it has high capacity for change. The lands are zoned as regeneration lands and so will be changing over time, according to the Tallaght Local Plan.

Around the site, the existing trees and vegetation has some value which has the potential to make a positive contribution to the site itself. The proximity to the LUAS station and other commercial and community land uses help to provide purpose and can inform site structure.

12.3.3 Summary of Landscape Characteristics and Values

The values and characteristics of the site are listed below and can be categorised in two ways – values which should be conserved, and those that provide opportunity for enhancement.

Conservation Values

The values to be conserved indicate those aspects of the receiving environment which are valued and sensitive and could be negatively impacted on by the proposed development. The only notable sensitivity to be conserved here are:

- the views to the Dublin Mountains and agricultural hinterland from the site
- the potential impact of the development on views from Belgard Heights
- the potential to have regard of the old Townland boundary

Enhancement Values

The values to be enhanced represents the site's capacity to accommodate change and therefore reflects landscape susceptibility. These include:

- A significant body of policy and zoning supports the development of the lands, *'to facilitate enterprise and/or residential-led regeneration'*, SDDP 2016-2022.
- A draft LAP providing guidance on the form, structure, height and use of the lands and environs in Cookstown that is supporting of significant local change.
- The existing old-style industrial character of the area (Brownfield) leading to generally poor landscape and visual quality
- The potential to instate green infrastructure.
- Proximity to major transport routes.
- Proximity to an established and growing town centre and county town.

12.4 Characteristics of the Proposed Development

The proposal relates to a mixed-use development on a site of c. 4.99 hectares comprising;

- 1,104 no. Build to Rent dwellings
- 4 no. commercial units at ground floor level of Blocks B and D
- 1,500sqm of office space across first to sixth floor levels of Block D
- A crèche, with associated outdoor play area, at ground floor level of Block C
- Road, junction and streetscape upgrade works along First Avenue, Cookstown Road and Old Belgard Road, including the installation a signalized junction at the intersection of First Avenue and Cookstown Road and Old Belgard Road and Cookstown Road;
- Construction of 3 no. new roads and 1 no. pedestrian/cycle link to the Belgard Luas Stop;
- Construction of a public plaza in the south-western corner of the site; and
- Associated site and infrastructural works are also proposed which include: foul and surface water drainage; attenuation tanks; lighting; landscaping; boundary fences; plant areas; ESB substations; internal hard landscaping, including footpaths and street furniture; and all associated site development works.

The proposed development is described in Section Two of the EIAR. The proposed landscape characteristics are defined by:

- A new urban green plaza with an outdoor flexible events space 'Cookstown Squared'
- A strong network of linear parks
- A new, active, pedestrian route to the LUAS
- A series of pocket plazas
- High quality streets with integrated SuDs features and raised tables
- 5 semi-private courtyards (4 at podium level and 1 at ground level).

12.5 Potential Impact of the Proposed Development

This section identifies potential impacts of the construction and operational phases of the development on the landscape and visual resource study area.

12.5.1 Construction Phase

Potential Landscape Impacts

The potential construction impacts on the landscape include the:

- Extensive change of the townscape from industrial lands to a construction site and the resultant change in landscape character
- Retention and safeguarding any boundary vegetation and trees
- Removal of the omission of selected mature trees and existing vegetation
- Resurfacing and widening of the road to the north of the site and the reestablishment of vegetation
- Movement of soil and storage of materials

Potential Impacts on Views

The potential construction impacts on views include the:

- Gradual erection of buildings and all engineering, building and landscape works required with associated site infrastructure, fencing and plant.
- Visibility of site plant and machinery, which will be both still and moving. Cranes will be visible over the roofs of existing buildings.
- Removal of surfaces which may result in the visibility of bare earth and the stockpiling of materials
- Omission of a single mature tree and section of an existing hedgerow along the northern boundary of the site.

12.5.2 Operational Phase

Potential Landscape Impacts

The potential operational impacts on the landscape include the:

- Change in character from industrial lands to a mixed-use development comprising 5 apartment blocks with a series of public spaces and semi-private courtyards.
- Construction of new movement infrastructure, roads, cycle paths and pedestrian paths, including a new, landscaped pedestrian link to the LUAS.
- The introduction of a landscape structure which includes a network of trees along streets and in the public and semi-private spaces, structure planting, habitat planting and planted swales.

Potential Impact on Views

The potential operational impacts on views include the:

- Introduction of new apartment buildings into the view
- Introduction of new movement infrastructure – roads, cycle paths and pedestrian paths into the view.
- Introduction of tree planting
- Introduction of more amenity lighting within public and semi-private spaces.
- Potential change in the skyline
- Potential screening of more expansive views
- Introduction of a more designed landscape
- Gradual establishment of new vegetation and planting in the streets, open spaces, gardens and along sections of the site boundary.

12.6 Potential Cumulative Impacts

The proposed development is one of several currently in train all required to deliver the proposed Tallaght Area Masterplan. Cumulatively, the following impacts are predicted:

- The proposed development will be a part of a wider re-developed area which will include taller, high-density, mixed-use buildings interspersed with high quality open spaces. It will change the existing land use of the site and bring with it, new streets, links and associated grey and green infrastructure. This will mean a change in the composition of views towards the site in general which will include a greater proportion of taller, high-density development, which will be interspersed with more trees. A number of developments within the wider area have planning approval or are going through the planning process. Once constructed, the character of the Cookstown industrial estate will change as envisaged and specified in Local policy.
- The application site will be viewed in context of the development described above.

12.7 Do-Nothing Approach

The '*do-nothing'* impact refers to the non-implementation of the proposed development. The primary effect of this would be that the impacts and effects identified would not directly occur. In this regard the following issues are relevant.

In the absence of this development this site would continue to operate or depreciate within a commercial/wholesale capacity. Its landscape, biodiversity and recreative values would continue to remain very limited. Depreciation and reduced activity could see the increase of antisocial behaviour and fly tipping on the site.

Subsequently the opportunity for significant positive change in the landscape and visual quality of the environs would be limited.

12.8 Remedial or Reduction Measures: Mitigation

The following recommendations are put forward to mitigate against the negative impacts mentioned above and to reinforce the positive impacts of the proposed development. Mitigation measures are proposed and considered only on the lands of the subject site.

12.8.1 Construction Phase

During construction there will be a change to the landscape and there will be negative visual impacts for residents and visitors to the areas adjacent to the site associated with construction activity.

The remedial measures proposed revolve around the implementation of appropriate site management procedures – such as the control of site lighting, storage of materials, placement of compounds, delivery of materials, car parking, etc. Visual impact during the construction phase will be mitigated somewhat through appropriate site management measures and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that public areas are kept free from building material and site rubbish.

Site hoarding will be appropriately scaled, finished and maintained for the period of construction of each section of the works as appropriate. To reduce the potential negative impacts during the construction phase, good site management and housekeeping practices will be adhered to. The visual impact of the site compound and scaffolding visible during the construction phase are of a temporary nature only and therefore require no remedial action other than as stated above.

Existing trees adjacent to the site will be retained and protected in accordance with Arboricultural Recommendations. With regard to the protection of the retained trees on site during proposed construction works, reference should be made to BS5837: Trees in relation Design, Demolition and Construction – Recommendations (BSI, 2012).

Adverse impacts both during construction and at operation phases could be mitigated through undertaking tree planting along the north of the site as early on in the construction process as possible to soften and screen views from the north.

12.8.2 Operational Phase

The scheme design reflects the planning objectives for the area and in general a positive transformation from a declining poor quality industrial character to a positive and modern new residential area that is an extension of the growing Tallaght Town Centre. The development incorporates significant consideration and of design features to enhance the quality of amenity for new residents as well as to mitigate any potential adverse impacts on nearby existing residents. These include;

- The retention of the existing adjacent rows of trees.
- The construction of a large landscape earthwork to the north of the site to soften views from the north and capture views from the LUAS against the backdrop of high quality, contemporary apartment buildings.
- The careful placement buildings, trees, artwork and features to create features and focal points in the views available.
- The softening of the existing predominantly hard landscape with lawns, tree planting, vegetation and planted swales. A mix of planting types and habitats create a varied landscape structure throughout the scheme. The extensive planting of additional trees will reduce the visual mass of the buildings, soften and partially screen the development over time from various viewpoints, as identified in the assessment, thereby minimising the visual impacts.
- The inclusion landscape works, which are proposed to reduce and offset the minimal impacts generated due to the proposed development, where possible. The planting of substantial numbers of new trees and other planting in the open spaces and along internal roads will enhance the overall appearance of the new development and compensate for the removal of the hedgerow to the north of the site.
- The design of public open spaces as part of an overall design strategy that focuses on creating a ‘sense of place’ and individual character for the development area. The quality of the public realm scheme is of a high standard and the quality of materials proposed is similarly high and robust.
- The introduction of colour and texture into the urban landscape through the use of materials and planting.
- The planting of native and appropriate species for biodiversity has been incorporated into the scheme in accordance with the advice of the Project Ecologist.
- The application of best practice horticultural methods to ensure that mitigation measures establish and grow appropriately.
- The proposal of additional planting between the noethern site boundary and Katherine Tynan road to mitigate habitat loss and create a softer transition between the residential areas north and south of Katherine Tynan Road.
- The design of public open space that forms part of a network of spaces that includes areas for passive and active recreation, social / community interaction and play facilities catering for all ages.
- The retrofitting of the surrounding roads infrastructure to suit the residential use of the development – removing high kerbs and installing cycle paths and planting trees in generous verges.

12.9 Landscape Assessment

12.9.1 Landscape Sensitivity

The subject lands directly affect the physical character of;

- LCA5 Suburban Dublin
- The site context, which includes all the character areas identified in Figure 12.8
- The Cookstown Industrial Estate and
- the subject lands itself.

LCA 5 Suburban Dublin is a large landscape character, which will not in its entirety be affected by the development application. Therefore, the assessment will rely on the local landscape character areas of;

- The site context
- The Cookstown Industrial Estate as identified in Figure 12.8; and
- the subject lands.

A review of the extent to which the development will affect the views experienced from adjacent landscapes are examined in section 12.10.

Assessments are made during the construction stage of the project and at operation. Effects are considered under the following headings:

- temporary effects (construction phase up to five years),
- short-term effects (operation phase up to seven years),
- medium-term effects (operation phase, seven to fifteen years) and
- long-term effects (operation phase, fifteen years and beyond).

Landscape Sensitivity Assessments

Descriptions of all landscape character areas can be found in Section 12.3.2.

Landscape Sensitivity: Site Context

The site context contains some valued elements such as the views towards the wider Dublin Mountains and agricultural hinterlands and the presence of homes and local greens, community buildings and schools. The 'Kingswood Hinterlands' local landscape character area contains the highest concentration of more valuable landscape features such as woodland, hedgerows, meadows and fields. Further south. the character is more incoherent and segregated with predominantly single uses present in the more established developed areas – such as the Cookstown Industrial Estate. Landscape features are limited in diversity and are not connected. Tallaght Town Centre has been more recently developed as is a mixed-use area designed to integrate with its immediate context.

As such, the landscape has capacity for change and development. This is recognised in landscape policy at local and county level. As such the landscape sensitivity of this landscape character area is <u>Medium.</u>

Landscape Sensitivity: Cookstown industrial Estate

Cookstown Industrial Estate is an area with few valued elements, features or characteristics with the exception of the views to the mountains and agricultural hinterland, a few localised playing pitches and rows of mature trees and the presence of some urban sports and businesses. The character of the landscape is such that its capacity for accommodating change is high; where development would make no significant change or would make a positive change. The principle management objective for the area is to facilitate change in the landscape through development, repair or restoration and this is stated in local policy. Therefore, the landscape sensitivity of Cookstown Industrial Estate is Low.

Landscape Sensitivity: Subject Lands

The subject lands contain very few valued elements, features or characteristics with the exception of the views to the mountains and agricultural hinterland, the proximity to the LUAS and Tallaght Town Centre which represents the potential townscape character achievable here, proximity to existing rows of trees and relationship with Cookstown Road which roughly follows the old townland boundary. The character of the landscape is such that it has capacity for change; where development would make no significant change or would make a positive change. The principle management objective for the area is to facilitate change in the landscape through development, repair or restoration and this is stated in local policy. Therefore, the landscape sensitivity of Cookstown Industrial Estate is Low.

12.9.2 Predicted Landscape Impact and Effects

Construction Impacts and Effects on the Landscape

The construction stage will result in ongoing infrastructure, building and related works for approximately 5 years as phased. This will entail:

- The protection of the trees around the site.
- The minimal removal of selected semi-mature trees.
- The temporary movement and stock piling of earth and materials.
- The temporary movement of machinery in and out of the site.
- All engineering, building and landscape works required with associated site infrastructure, fencing and plant.

Overall, the impacts described are generally short-term, destructive and visually adverse in nature.

Construction Effects on the Site Context (Medium sensitivity)

The effects during construction would relate to a small geographical extent of this LCA. Development works are to be expected in such an urban environment and are not out of keeping with the expected character of the wider area. Tall site plant may have a temporary adverse effect on some views, which are noted in the visual assessment. The magnitude of change to this character area, during construction is expected to be Low which generates a Slight adverse, temporary effect.

Construction Effects on Cookstown Industrial Estate (Low sensitivity)

The effects during construction would relate to a moderate geographical extent of this LCA resulting in partial loss of the existing industrial character and land use. The change would introduce some elements that are uncharacteristic with the LCA such as the movement of materials and destruction and rebuilding of buildings. But these are not unexpected and are present in local policy and planning. The presence of machinery (albeit smaller in scale than cranes and the tallest site plant) is in keeping with the industrial nature of this character area. The magnitude of change to this character area, during construction is expected to be Medium which generates a Slight adverse, temporary effect.

Construction effects on the Subject Lands (Low sensitivity)

The effects during construction would impact the entire geographical extent of this LCA resulting in the change of all elements in it from an industrial character to a building site as works progress to developing a new neighbourhood. There are planned changes, in keeping with local planning policy and development works are expected in an urban area. The presence of machinery (albeit smaller in scale than cranes and the tallest site plant) is in keeping with the industrial nature of this character area. The overall magnitude of change to the subject lands is considered High which generates a Moderate-slight, adverse, temporary effect.

Operational Impact and Effects on the Landscape

The site's Enhancement Values reflect a significant body of policy that is supportive of major landscape change at this location to form a new, high density, mixed use but predominantly residential community. This change in land use is more reflective of the context of the site and the scale of the development is in keeping to that already complete to the south, towards Tallaght Town Centre. However, the proposed scale of development contrasts with the predominantly two storey residential buildings to the north of Katherine Tynan Road. This contrast would be softened with proposed tree and shrub planting along the northern site boundary of the subject lands. There is also potential to extend this approach off site on the open space lands between the application site boundary and Katherine Tynan Road.

The site's Conservation Values predominantly reflect the views to the Dublin Mountains and agricultural hinterland and from Belgard Heights. The old townland boundary is roughly expressed through the presence and route of Cookstown Road. The alignment of the road will be retained. The treatment of the road and streetscape will be improved. New street trees, surfacing and kerbs will improve its perceived status. The introduction of green spaces into the urban landscape will go some way to turning the tide against the hard, built environment associated with the Industrial Estate. The inclusion of pocket parks, tree planting and vegetation will provide urban green infrastructure and allow the evolution of urban ecology in a place where it was not previously possible.

The impact of the development is the change of the site from an industrial urban area to a mixed use but predominantly residential, high density urban area. Existing block structures are retained and permeability through the blocks is improved by connecting all the way through blocks. Views towards the Dublin Mountains will be retained and increased by providing more north-south streets aligned to the views. More people will experience the views from the apartments and roof gardens proposed. The visual impact on Belgard Heights will be assessed in 12.10 of this report.

The proposed development has been prepared in accordance with best practice national guidelines local guidance in the South Dublin Development Plan 2016-2022 and Draft Tallaght Town Centre – Local Area Plan 2020-2026 and National Guidance – Urban Design Guide 2009 by the Department of Environment, Heritage and Local Government and the Design Manual for Urban Roads and Streets by the Department of Transport, Tourism and Sport. The site layout has been sensitive to the landscape elements of value on the site, incorporating them into the development, adding value to them and enhancing their role.

The effects of this in terms of alteration of the landscape character are assessed below.

Operational Effects on the Site Context (Medium sensitivity)

The effects of the development at operation would relate to small geographical extent of this LCA. The introduced elements may be prominent but are not uncharacteristic in terms of the context of the site, physically and in planning terms. The character of the immediate site will be altered, and the change will result in a better integrated, more usable and greener townscape. The new architecture, streetscape and open space network will improve the townscape and result in an urban area that better compliments the LUAS station, the residential areas to the north and Tallaght Town Centre to the South than the existing industrial lands.

Immediately post-construction, the new development is likely to contrast with its immediate surroundings but over time, as vegetation matures and as other plots within the industrial estate are developed up, edges will be softened, and contrasts will be diminished. The planting to the north of the site and along streets will play an important role in connecting green infrastructure and softening views.

As such, in the short term, the Magnitude of Change relative to the whole character area is considered Medium which generates a Moderate effect. Qualitatively, the landscape effect is Beneficial because the change in the landscape achieves policy objectives and will improve the townscape and its character. It will enable the creation of valued features and will introduce green infrastructure which was previously very limited. In the medium and long term, the effect of green infrastructure would be improved as it matures but not to an extent that would change this assessment.

Operational Effects on Cookstown Industrial Estate (Low sensitivity)

The effects of the development at operation would relate to a moderate geographical extent of this LCA. The scheme would introduce large elements resulting in the complete change of character to the application lands in a way that complement the envisaged scale, landform and pattern of the landscape and townscape described within the Draft Tallaght Local Plan, already realized in Tallaght Town Centre. Change is moderate in scale in relation to the whole LCA and results in the introduction of elements that are more characteristic of the context than existing land uses and characteristics.

Immediately post-construction, the new residential use is likely to contrast with the existing established adjacent industrial townscape character. However, over time, as vegetation becomes established and the Tallaght Local Plan is realised and other developments are completed and contrasts will be diminished. The maturity of the vegetation will play an important role in connecting green infrastructure and softening views.

As such, in the short term, the Magnitude of Change relative to the whole character area is considered High which generates a Moderate-Slight effect. Qualitatively, the landscape effect is Beneficial because the change in the landscape achieves policy objectives and will improve the townscape and its character. It will enable the creation of valued features and will introduce green infrastructure which was previously very limited. In the medium and long term the effect of green infrastructure would be marginally improved as it matures but not to an extent that would change this assessment.

Operational Effects on The Subject Lands (Low sensitivity)

The effects of the development at operation would relate to the entire geographical extent of this LCA. The scheme would introduce large elements resulting in the complete change of character to the application lands in a way that complement the envisaged scale, landform and pattern of the landscape and townscape described within the Draft Tallaght Local Plan. Change is extensive in scale and results in the introduction of elements that are fundamentally different to the existing landscape character.

Immediately post-construction, the new neighbourhood is expected to improve the townscape quality, fit well with the proposed scale and development patterns envisaged for the areas and introduce an energetic urban character. Green spaces and vegetation will be planted and provided but their true benefit will not be fully experienced until they have matured. Upon maturity, the urban landscape here is expected to be of a very high quality providing green links, spaces, SuDs solutions and streets.

As such, in the short term, the Magnitude of Change expected to the subject lands is considered Very High which generates a Moderate effect. Qualitatively, the landscape effect is Beneficial because the change in the landscape achieves policy objectives and will improve the townscape and its character. It will enable the creation of valued features and will introduce green infrastructure which was previously very limited. In the medium and long term the effect of green infrastructure would be improve the quality of the proposed townscape further as it matures but not to an extent that would change this assessment.

12.9.3 Summary of Effects on the Landscape

The following table summarises the results of the assessment of the effects of the proposed development on the landscape resource.

Landscape Character Area	Sensitivity	Significance, Term and Quality				
		Assessment Categories	Construction Phase – temporary effects	Operational Phase		
				Short-term effects (up to 7 years)	Medium-term effects (7-15 years)	Long term effects (15 years and beyond)
Site Context	Medium	**Magnitude of Change**	Low	Medium	Medium	Medium
		Significance of Effect	Slight	Moderate	Moderate	Moderate
		Qualitative Assessment	Adverse	Beneficial	Beneficial	Beneficial
Cookstown Industrial Estate	Low	**Magnitude of Change**	Medium	High	High	High
		Significance of Effect	Slight	Moderate-Slight	Moderate-Slight	Moderate-Slight
		Qualitative Assessment	Adverse	Beneficial	Beneficial	Beneficial
Subject Lands	Low	**Magnitude of Change**	High	Very high	Very high	Very high
		Significance of Effect	Moderate-Slight	Moderate	Moderate	Moderate
		Qualitative Assessment	Adverse	Beneficial	Beneficial	Beneficial

Table 12.6 Summary of Landscape Effects

The proposed development is expected to have a temporary adverse effect on the landscape resource during construction. Upon operation and into the future, the development is expected to have a beneficial long term / permanent effect on the landscape and townscape resource in the area.

12.10 Predicted Visual Effects

Based on the assessment of the landscape characteristics, values and sensitivities, 13 representative viewpoints were selected to assess visual impact and effects. These are scheduled and mapped below. Existing photographs and proposed photomontages are provided by 3D Design Bureau.

Verified views for viewpoints 1-11 were captured in December 2019 when the trees were not in leaf. Viewpoints 12-13 were captured in June 2020. The landscape architect's site survey was conducted in May 2020. As such, the description of existing views provided in this section reflects summer and winter scenarios.

The assessed viewpoints are shown on Figure 12.9 overleaf and are listed in Table 12.7 overleaf. A sensitivity rating has been ascribed to each visual receptor based on the definitions provided in table 12.4. A rationale for the sensitivity rating is provided under the description of each existing view overleaf.

No.	Receptor and views	Rationale for selection	Viewpoint sensitivity ratings.	Approx. distance from site boundary
VP01.	View S from Belgard Community Centre / Old Belgard Road	Representative of views experienced from the community center, amenity space and from the rear of properties on Kingswood View and Garrynisk Square	Medium	240m
VP02.	View W from Parkhill Road.	Representative of views from front elevations of residential receptors located on Parkhill Road.	High	220m
VP03.	View W from Redwood and Parkhill Road Public open space.	Representative of views experienced from the public open space	High	285m
VP04.	View W from the corner of Mayberry Road and Belgard Road.	Representative of views experienced by road users and pedestrians approaching Tallaght from the west.	Medium	520m
VP05.	View NW from Institute of Technology Tallaght.	Representative of views experienced from the campus drive.	High	770m
VP06.	View N from Belgard Square North.	Representative of views experienced from Tallaght town Centre	High	1030m
VP07	View N from intersection of Cookstown Road and Second Avenue.	Representative of close-range views experienced from by road users and pedestrians	Negligible	90m
VP08.	View NE from Lanndale Lawns public open space	Representative of views experienced by pedestrians from the public open space	Medium	800m
VP09.	View E along Katherine Tynan Road	Representative of views experienced by road users	Low	675m
VP10	View S from The Meadows West	Representative of views from front elevations of residential receptors located on The Meadows West	High	105m
VP11	Viewed SE from The Dale	Representative of views from front elevations of residential receptors located on The Dale	High	360m
VP12	View SW from Belgard Luas stop looking SSW	Representative of views experienced from the LUAS stop	Medium	45m
VP13	View NE from Cookstown Way / Tallaght Hospital LUAS stop.	Representative of views experienced from the LUAS stop	Medium	775m

Table 12.7 Schedule of assessed visual receptors

Figure 12.9 Map of Viewpoints

Visual effects are assessed initially in the Construction phase and thereafter in the Operational Phase. Effects are considered under the following headings:

- temporary effects (construction phase up to five years),
- short-term effects (operation phase up to seven years),
- medium-term effects (operation phase, seven to fifteen years) and
- long-term effects (operation phase, fifteen years and beyond).

Photography and presentation of viewpoints

Each Viewpoint is illustrated by a photograph showing the existing view and the photomontage, or technical visualisation, showing the proposed development.

Photographs and photomontages have been produced by 3DDesign Bureau and are presented in a separate booklet with a map of their locations. Verified photographs and photomontages have been taken with a wide angle focal length (FL) and prime lens to allow representation of the development within its context. In all visualisations, the extent of the 50mm FL view has been indicated for reference, which is broadly equivalent to the c.40 degree Horizontal Field of View (HFoV) and is representative of what the human eye perceives and reflects the requirements of the Landscape Institute Technical Guidance Note on Visual Representation 2019.

Each viewpoint is described below in two parts, firstly its existing (baseline) condition, and secondly to describe the predicted effects or change brought about by the proposed development. The descriptions, including the change / effects, focus primarily on the extent of the 50mm view but refers also to the wider context provided by the visualisation, as appropriate, to inform analysis.

To correctly view the photomontage at the appropriate scale the extents of the 50mm FL lens or 40 degree HFoV should be extended to A3 in size and viewed at arm's length. This can be done by printing a hard copy or, more easily, digitally on screen, allowing reference back to the wider angle visualisation to help understand the context.

12.10.1 Construction Impacts and Effects on Visual Receptors

The construction phase is expected to be phased over five years, which will limit the extent of impact at any given time which is associated with construction.

There will be moderate negative impacts associated with the construction works over a phased basis for this development. This will be due to the substantial site clearance and building processes required to construct the proposed development. Effects on visual receptors are tabulated according to the representative viewpoints below, but by their nature are predominantly adverse in nature, varying in magnitude and significance. All effects on visual receptors resulting from the construction stage are expected to last under five years and are all therefore considered temporary effects.

No.	Receptor and views	Viewpoint sensitivity rating	Magnitude of change	Significance, Quality and Longevity
VP01.	View S from Belgard Community Centre / Old Belgard Road	Medium	Partial visibility of the construction works in a small part of the view in the mid-ground. Tall site plant would be visible as well as the developing buildings. In summer, the works would be well-screened by existing vegetation. Works not out of character along the urban edge and visual amenity retained = Medium	*Moderate Adverse, Temporary effect*
VP02.	View W from Parkhill Road.	High	Partial visibility of phased construction works which would be visible in the mid-background of the view. No alteration of visual amenity or overall character = Medium	*Significant Adverse, Temporary effect*
VP03.	View W from Redwood and Parkhill Road Public open space.	High	Partial intrusion of phased construction works – resulting in a slight change in composition but no change in visual amenity = Medium	*Significant Adverse, Temporary effect*
VP04.	View W from the corner of Mayberry Road and Belgard Road.	Medium	Partial intrusion of phased construction works resulting in minor alteration to the composition and character of the view but no change to visual amenity = Medium	*Moderate Adverse, Temporary effect*
VP05.	View NW from Institute of Technology Tallaght.	High	Barely discernible intrusion of phased construction works – resulting in a slight change in composition but no change in visual amenity = Negligible	*Slight-Not Significant Adverse, Temporary effect*

VP06.	View N from Belgard Square North.	High	Barely discernible intrusion of phased construction works – resulting in a slight change in composition but no change in visual amenity = Low	*Moderate-Slight Adverse, Temporary effect*
VP07	View N from intersection of Cookstown Road and Second Avenue.	Negligible	Extensive intrusion of phased construction works in the view but in keeping with the industrial character of the view = High.	*Not Significant Adverse, Temporary effect*
VP08.	View NE from Lanndale Lawns public open space	Medium	Not visible = Negligible	*Not Significant Adverse, Temporary effect*
VP09.	View E along Katherine Tynan Road	Low	Minor intrusion of phased construction works resulting in minor alteration to the composition and character of the view but no change to visual amenity = Low.	*Not Significant Adverse, Temporary effect*
VP10	View S from The Meadows West	High	Minor intrusion of phased construction works which would be visible as part of the backdrop of the view over rooftops – more so in winter when trees are not in leaf. No alteration of visual amenity or overall character = Low.	*Moderate - Slight Adverse, Temporary effect*
VP11	Viewed SE from The Dale	High	Partial intrusion of phased construction works which are not uncharacteristic given the industrial nature of the development site = Medium	*Significant Adverse, Temporary effect*
VP12	View SW from Belgard Luas stop looking SSW	Medium	Intrusion of phased construction works which are not uncharacteristic given the industrial nature of the development site = High	*Significant Adverse, Temporary effect*
VP13	View NE from Cookstown Way / Tallaght Hospital LUAS stop.	Medium	Not visible = Negligible	*Not Significant Adverse, Temporary effect*

Table 12.8 Summary of Visual Effects – Construction Stage

12.10.2 Operational Impacts and Effects on Visual Receptors

Viewpoint 1 – Belgard Community Centre / Old Belgard Road

Existing view

This view from Old Belgard Road looks south towards the site, which is approximately 240m away. The view is representative of views experienced from Old Belgard Road, the community centre, amenity space and from the rear of properties on Kingswood View and Garrynisk Square.

Plate 11: View from the rear of Belgard Community Centre

The view is mostly accommodated by the Old Belgard Road and the adjacent green. Large, specimen trees and roadside screening vegetation provide interest in the mid-ground of the view. Views towards the LUAS line and Cookstown Industrial Estate are visible through the trees over a 2m high blockwork wall. These elements suggest a change in character from a suburban area to a place which is likely to be more urbanised. The Dublin Mountains forms a backdrop to the view in places. The view is interspersed with road signs, street-lights and telecommunications wires.

Overall, although this view contains some urban elements, the trees in the mid-ground of the view are the most distinctive and attractive features.

The **Sensitivity of the Visual Receptor is <u>Medium</u>** reflecting the presence of residential receptors but also that people using the amenity spaces and road would be more focused on activities unrelated to the landscape and the view (e.g. playing sports).

Visual Impacts and Effects

The view would change to include northern elevations of the development which would be visible behind, below and through the canopies the existing trees and over the existing industrial buildings (which will themselves be developed in time). The development would be visible much screened by existing trees, which although would lose their leaves in winter, are planted so closely and in such a number that they would still screen the development and interest to the view although to a lesser extent. The proposed development would create a high-quality urban edge and a new visual feature in the view. Although the new buildings would be prominent and would contrast with the low-rise development currently visible, the line of urban development already present would be retained and the buildings would reduce the impact of the existing detractors. The visual amenity of this receptor would be mostly unaltered although the long-distance views to the mountains will be obscured. Whilst there is some erosion of the prospect of the Dublin Mountains the development is also part of the beneficial change of the middle ground view from industrial to urban / residential, and, like the LUAS station and tram line part of urban place-making and improved infrastructure occurring for the area. Over time, new tree planting associated with the development would be visible, which would further filter views to the apartments.

The magnitude of change would be <u>Medium.</u> *(Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context)* and would remain so in the **<u>Short, Medium and Long Term.</u>**

The Significance of the effect is <u>Moderate.</u>

Qualitatively the effect would be <u>Neutral</u> *(Scheme complements the scale, landform and pattern of the landscape(townscape)/view and maintains quality).*

Whilst there is some erosion of the prospect of the Dublin Mountains the development is also part of the beneficial change of the middle ground view from industrial to urban / residential, and, like the LUAS station and tram line part of urban place-making and improved infrastructure occurring for the area.

Viewpoint 2 – Parkhill Road

Existing View

This view from Parkhill Road looks west towards the site, which is approximately 220m away over The Belgard Road. The view is representative of views experienced from the frontages of homes located on Parkhill Road.

Plate 12: View from Parkhill Road

Parkhill Road is located at a lower elevation than Belgard Road and the site, which means that immediate views from front doors towards this busy road and Cookstown industrial Estate, which is visible in the mid ground of the view are partially screened by a grassy verge, shrub planting and railings.

The centre of the view contains the east-facing edge of the Cookstown Industrial Estate. The CPM offices located on the intersection of Cookstown Road and Old Belgard Road is notable atop existing carparks in the middle of this view. From this particular viewpoint, there is a gap between the existing buildings through which the Dublin Mountains are glimpsed to the very rear of the view. The visibility of the Dublin Mountains changes along Parkhill. The skyline of the view is punctuated throughout with high lighting poles, pylons and overhead wires.

Overall, the view is not particularly attractive, contains many incoherent and unvalued elements and contrasts with the residential character of Parkhill.

The sensitivity of the receptor is <u>High</u> to reflect everyday views from the front elevations of residential properties.

Visual Impacts and Effects

The view would change to include the development which would form a partial intrusion in the middle of this view with the proposed apartment blocks located to the rear of the existing CPM office building on Old Belgard Road. This will prevent the glimpse to the Dublin Mountains from this particular viewpoint. It should be noted that views to the Dublin Mountains change along Parkhill Road and are not always visible. The new buildings would be of high quality and the development would better complement existing residential uses west of Belgard Road. However, there would still be much incoherence in the view due to the existing treatment of Belgard Road. This incoherence would diminish over time as the Tallaght Local Plan is realised and the Belgard Road frontage becomes more street-like. Although the proposed development adds to this view and strengthens townscape character, the level of visual amenity will remain unchanged.

The magnitude of change would be <u>Medium</u> *(Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context)* and would remain so in the **<u>Short, Medium and Long Term.</u>**

The effect is <u>Significant.</u>

Qualitatively the effect would be Beneficial *(The scheme improves townscape quality and character, fits with the scale, landform and pattern and enables the restoration of valued characteristic features).*

Viewpoint 3 – Redwood Public Open Space

Existing View

This view from the public open space within Parkhill Road and Redwood Drive and Way looks west towards the site, which is approximately 285m away. The view is representative of views experienced from the public open space and from frontages of homes located on Redwood Way (located 400m away from the site boundary).

Plate 13: View west from the POS adjacent to Redwood Drive

The foreground of the view is largely dominated by the grassed public open space itself. The public open space is mediocre in quality with few landscape features present except for a cluster of trees planted around a junction of pathways. The topography appears flat.

To the left-hand side of the view are the two storey homes located along Parkhill Road. There are few street trees and garden trees present. To the right-hand side of the view are the bungalows along Parkhill Drive which contain the public open space. An existing pylon sited between Parkhill Road and Old Belgard Road is prominent in the centre of the view. Slightly left of this and to the rear, the pylon sited between the application site and the LUAS is visible. The existing CPM offices located on the intersection of Old Belgard Road and Cookstown Road is visible over the houses and garden vegetation on Parkhill Road.

Overall, the open view over the green and low-density residential townscape is attractive but is somewhat featureless and lacks character.

The sensitivity of the receptor is High to reflect everyday views from the front elevations of residential properties.

Visual Impacts and Effects

The view would change to include the upper two stories of blocks D and A which are a minor intrusion in the view behind and slightly protruding above the existing buildings on Belgard Road and Old Belgard Road. Block B would be visible above the homes on the left-hand side of the wide angled view. The extent that Block A protrudes into the view is equivalent to the existing garden tree located in the rear garden to the left of Block A, indicating the potential impact of further tree planting on streets and within the green itself. The development would be more visible behind existing trees in winter. The presence of the development in the view suggests the existence of a town centre, which would positively contribute to the sense of neighbourhood and place for people living in this area. This effect would be strengthened by the full realisation of the Tallaght Local Plan. Until then, there is a variance of scale between the existing housing and Block A.

Over time, young trees, recently planted on the Belgard Road will have matured and these will filter views towards the development.

The magnitude of change in the short-term would be Medium. *(Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context).* In the **medium and long-term, the magnitude of change would reduce to Low** as existing young trees on Belgard Road mature to obscure views towards the development.

The effect is <u>Significant</u> and qualitatively **<u>Adverse</u>** in the **<u>short term</u>** (*Scheme at variance with scale).*

The Significance of the effect would improve to <u>Moderate-Slight</u> in the **<u>Medium and Long term</u>** which is qualitatively **<u>Beneficial</u>** *(The scheme improves quality)* due to the positive urban place-making effect of the scheme.

Over time, as the Tallaght Town Centre Local Area Plan is realised, further development is likely to obscure much of the development described above. There is likely to be a more street-like character along Belgard Road, which is likely to provide more of a transition in scale between Block A and the existing housing at Redwood.

Viewpoint 4 – Mayberry Road and Belgard Road intersection

Existing View

This view from the intersection of Mayberry Road and Belgard Road looks west towards the site, which is approximately 520m away. The view is representative of views experienced by road users.

Plate 14: View west from the Mayberry Road and Belgard Road intersection

The foreground of the view is largely dominated by the Belgard Road Corridor, which at this point has 4 road lanes and an on-street cycle paths with a grassed central median and verges between the cycle path and adjacent pavements.

Few landscape features are present in the views over the public open space opposite this junction except for a cluster of trees planted around a junction of pathways. A medium height brick wall marks the boundary of Cookstown industrial Estate which is visible along the centre of the view. The CPM office block is visible to the rear of the retail / industrial red-brick buildings visible to the right-hand side of the view. The existing Poplars adjacent to the south-eastern application site boundary are clearly visible in the centre of the view. To the fore and to the left of these trees, a cluster of mixed planted trees in and around a small public open space at intersection of Old Belgard Road and Belgard Road are visible. The trees are the most important landscape features in the view.

Overall, this is a view overlooking a busy urban movement corridor. Its most prominent visual features are the existing trees but the architecture and buildings are incongruous and provide little spatial definition.

The sensitivity of the receptor is <u>Medium</u>. People viewing their surroundings from this viewpoint are primarily engaged in travelling and will be moving at slow to moderate speeds. They are partly but not entirely focused on the landscape.

Visual Impacts and Effects

The view would change to include Block D, which would be partially visible in the backdrop of the view, protruding above the existing development along Belgard Road. In winter, when trees in the middle ground of the view drop their leaves, the development would be more visible. This intrusion would be prominent but not uncharacteristic in the context of the view. The development would appear to be of a much higher quality than the existing industrial estate currently occupying the landscape and visible in the foreground of the view. The development is in keeping with the scale of the Belgard Road movement corridor and provides a better sense of enclosure.

Over time, as the Tallaght Town Centre Local Area Plan is realised, further development is likely to obscure much of the development described above. The frontage along the Belgard Road is likely to appear more street-like and young trees recently planted on the Belgard Road will have matured and these will filter views towards the development.

The magnitude of change would be <u>Medium</u> *(Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context)* and would remain so in the **<u>Short, Medium and Long Term.</u>**

The Significance of the effect is <u>Moderate.</u>

Qualitatively the effect would be <u>Beneficial</u> *(The scheme improves townscape quality and character, fits with the scale, landform and pattern and enables the restoration of valued characteristic features).*

Viewpoint 5 – Institute of Technology Tallaght.

Existing View

This view from the Institute of Technology's driveway looks northwest towards the site, which is approximately 770m away. The view is representative of views experienced from the campus drive and playing pitches. The campus itself was inaccessible at when baseline photography was undertaken.

Plate 15: View north-west from the Institute of Technology Tallaght.

The foreground of the view is largely dominated by the roundabout. Buildings to the right-hand side of the view are more visible form within the campus itself. The treeline along Belgard Road is well-established. From the campus, developments and buildings on Belgard and Airton Roads are visible in the middle distance. These are interspersed with small groups and short rows of mature deciduous trees. The topography appears flat.

Overall, the open view over this part of the campus towards the surrounding town is green and attractive.

The sensitivity of the receptor is <u>High</u> because it is valued by people who use it regularly and frequently.

Visual Impacts and Effects

The indicative view represented by the verified view photography and montages would not change because the development is mostly screened by existing vegetation and buildings located between the viewpoint and the application lands. From within the campus itself, very minor intrusions of the development may be discernible through and over buildings and vegetation however these would be perceived as part of a broader higher density development already beginning to emerge in Cookstown.

The magnitude of change would be <u>Negligible</u> *(Barely discernible intrusion of the development into the view)* and would remain so in the **<u>Short, Medium and Long Term.</u>**

The Significance of the effect is <u>Slight-Not Significant.</u>

Qualitatively the effect would be <u>Neutral</u> *(Maintains quality).*

Viewpoint 6 – Belgard Square North.

Existing View

Plate 16: View north from Belgard Square North.

This view from Belgard Square North looks north towards the site, which is approximately 1030m away. The view is representative of views experienced from Tallaght town Centre.

From this viewpoint, the existing apartments are the most prominent feature in the foreground. However, this viewpoint is representative only and more open views would be experienced from the upper floors of apartments facing the site. It was not possible to access such locations from the public realm.

At present, Cookstown Industrial estate is visible to the mid-centre of this view over flat edgelands. It is not possible to identify any buildings located upon the application lands from this viewpoint however the site would be visible from high elevations looking north.

Overall, the views over the Cookstown Industrial Estate are unattractive, contain few trees and are incongruous with the developing character of Tallaght Town Centre.

The sensitivity of the receptor is <u>High</u> because it represents potential residential receptors.

Visual Impacts and Effects

The view would change to include the upper floors of the development which would initially be visible, to a minor extent over low-lying industrial sheds and buildings. The development contrasts with Cookstown Industrial Estate as is but is highly representative of the future proposed character of the Tallaght Town Centre Local Area Plan and this development will achieve a much high urban quality and character than is currently present in Cookstown Industrial Estate. Over time, as this is realised, the landscape between the viewpoint and the application lands will all be re-developed and all views towards the proposal site are likely to be obscured. New tree planting associated with future planned developments will also soften, screen and filter views further.

The magnitude of change would be <u>Low</u> *(Minor intrusion of the development into the view)* and would remain so in the **<u>Short, Medium and Long Term.</u>**

The Significance of the effect is <u>Moderate-Slight</u>

Qualitatively the effect would be <u>Beneficial</u> *(The scheme improves townscape quality and character, fits with the scale, landform and pattern and enables the restoration of valued characteristic features).*
Over time, additional development between the application site and the viewpoint is likely to obscure most of the development and so the Magnitude of Change to this view caused by the development would diminish.

Viewpoint 7 – Cookstown Road and Second Avenue intersection.

Existing View

This view from the Belgard Square North looks north towards the site, which is approximately 90m away. The view is representative of close-range views experienced from by road users and pedestrians.

Plate 17: View north from Cookstown Road (South)

The foreground on the view is currently dominated by Cookstown Road with its high, oversized carriage kerbs and barrier railings. These elements, combined with the industrial buildings, the expansive areas of hard surfacing and the security style boundary treatments all combine to create a functional, unwelcoming, industrial character. The row of Poplar trees to the left-hand side of the view is the strongest landscape feature present. It is also possible to see the pylon and the open space it is located within between buildings in the background, aligned with Cookstown Road.

Overall, this view is of a flat, industrial landscape containing few attractive features except for the row of existing Poplar trees.

The sensitivity of the receptor is <u>Negligible</u> reflecting that people involved in activities here are not focused on the landscape e.g. people at their place of work. The view has no relevance and is of poor quality and not valued. There is no evidence that this view is valued or regarded as an important element in this landscape.

Visual Impacts and Effects

The view would change to include much of the south-western edge of the development within the centre of the view above the roundabout and existing low-lying industrial units. The proposed south-west corner block of Block A would become a distinctive building on the corner of Cookstown Way. All existing tree planting will be retained, and new tree planting will begin to add landscape structure to the streets.

The existing infrastructure, buildings and street furniture of the remaining industrial estate all detract from the quality of the urban development proposed, which will continue to dominate the foreground of the view until the Tallaght Town Centre Local Area Plan is realised.

The magnitude of change would be <u>High</u> *(Extensive intrusion of the development into the view affects the character of the view)* and would remain so in the **<u>Short, Medium and Long Term.</u>**

The Significance of the effect is <u>Slight-Not Significant.</u>

Qualitatively the effect would be <u>Beneficial</u> *(The scheme improves townscape quality and character, fits with the scale, landform and pattern and enables the restoration of valued characteristic features).*

Viewpoint 8 - Lanndale Lawns public open space

Existing View

This view from the Belgard Square North looks north towards the site, which is approximately 800m away. The view is representative of views experienced by pedestrians from the public open space.

Plate 17: View north Lanndale Lawns Public open space

The foreground on the view is largely taken up with the grassed public open space which generally open and featureless except for several small groups of ornamental trees and lighting poles. To the right-hand side of the view, the houses along Birchwood Heights and Close are visible.

Along the centre-line of the view the hedgerows and trees along Cookstown Way and the LUAS screen much of Cookstown Industrial Estate which visible in the midground. There are very few vertical features present and the topography is flat. It is not possible to identify any buildings or features located upon the application lands from this viewpoint at present.

Overall, this view over a flat, residential amenity landscape is somewhat attractive but is indistinct.

The sensitivity of the receptor is <u>Medium</u>. People using the public open space here will value the presence of the vegetation and while may not be consciously engaged with viewing the landscape, it forms an attractive backdrop to the open views experienced.

Visual Impacts and Effects

The indicative view represented by the verified view photography and montages would not change because the development is mostly screened by existing vegetation and buildings located between the viewpoint and the application lands

The magnitude of change would be <u>Negligible</u> *(Barely discernible intrusion of the development into the view)* and would remain so in the **<u>Short, Medium and Long Term.</u>**

The effect is <u>Not Significant.</u>

Qualitatively the effect would be <u>Neutral</u> *(Maintains quality).*

Viewpoint 9 - Katherine Tynan Road

Existing View

This view from Katherine Tynan Square looks east towards the site, which is approximately 675m away. The view is representative of views experienced by road users.

Plate 18: View east along Katherine Tynan Road

The road itself is the most prominent feature in the view. The rear elevations of properties on The Lawn are visible on the left-hand side of the view. To the right, the vegetation separating Katherine Tynan road from the LUAS is visible. The row of power lines located within the verge are notable vertical features in the view. Power lines, road and infrastructure associated with the LUAS are also prominent and break up the sky. The pylon located north of the application boundary is visible in the centre of the view with the CPM building visible through existing trees to the right of this.

Overall, this view is functional in character. Vegetation softens the infrastructure but there a few features that make this particular stretch of road distinct or identifiable.

The sensitivity of the receptor is <u>Low</u>. People using the road here will mainly be travelling at medium to high speeds and will be mainly focussed on the road rather than the surrounding landscape, which forms a backdrop.

Visual Impacts and Effects

The view would change to include the upper stories of most of the development which would be partially visible in the mid-ground, protruding over existing boundary treatments and vegetation to the south of the road. The view would continue to be regularly broken by the row of pylons that flank the same boundary and are prominent in the fore-mid ground of the view.

The change would provide visual interest and a sense of the existence of an urban centre to the south of Katherine Tynan Road. In comparison to the existing Industrial Estate, this is regarded as an improvement to the view and aids urban place-making and one which better compliments the residential neighbourhoods to the north.

The magnitude of change would be <u>Medium</u> *(Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context)* and would remain so in the **<u>Short, Medium and Long Term.</u>**

The Significance of the effect is <u>Slight.</u>

Qualitatively the effect would be <u>Beneficial</u> *(The scheme improves townscape quality and character, fits with the scale, landform and pattern and enables the restoration of valued characteristic features).*

Viewpoint 10 – The Meadows West

Existing View

This view from The Meadows West looks southeast towards the site, which is approximately 105m away. The view is representative of views experienced by people using the public open space here and from the front facades of properties facing the site on The Meadows West.

Plate 19: View southeast from The Meadows West

The foreground on the view is largely taken up with the grassed public open space which generally open and featureless except for mature trees that are mainly planted around the edge of the green. The lands slope down towards Katherine Tynan Road. The southern hedgerow boundary of the green is visible to the right, centre. The lack of development along this edge allows open views to the Dublin Mountains which provide the backdrop of this view. It is not possible to identify any buildings of features located upon the application lands from this viewpoint however the pylon located to the north of the site is discernible over the top of the houses located on The Meadows East, visible along the middle of this view.

Overall, this is a residential view towards the Dublin Mountains.

The sensitivity of the receptor is <u>High</u> to reflect everyday views from the front elevations of residential properties.

Visual Impacts and Effects

The view would change to include the upper stories of the development which would be partially visible to the rear of the view slightly higher than the existing rooftops of the semi-detached houses but lower than the existing canopies of the semi-mature trees located around the green. The backdrop of the Dublin Mountains would be largely retained.

The presence of the development in the view has no effect on visual amenity but does urbanise the view from these receptors to a minor extent. This change is in keeping with local planning objectives and is not out of context on the edge of the city.

Over time, trees proposed along the northern edge of the scheme and planted around The Meadows would mature to filter views a little more

The magnitude of change would be <u>Low</u> *(Minor intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context)* and would remain so in the **<u>Short, Medium and Long Term.</u>**

The Significance of the effect is <u>Moderate-Slight.</u>

Qualitatively the effect would be <u>Neutral</u> *(Maintains quality).*

Viewpoint 11 – The Dale

Existing View

This view from Dale looks southwest towards the site, which is approximately 130m away. The view is representative of views experienced by people using the public open space here and from the front facades of properties facing the site on The Dale.

Plate 20: View southwest from The Dale

The foreground of the view partially contains the public open space and road. The public open space is unremarkable and is largely featureless. Dividing the view is a high rendered wall, partially covered in Ivy, which at street level screens Katherine Tynan Road. The Ivy does very little to screen Cookstown Industrial Estate, the LUAS stop and CPM offices, which are visible over it. The LUAS stop is particularly prominent due to its size and style, which contrasts with the existing surrounding townscape and is more reflective of the proposed Tallaght Town Centre Local Area Plan objectives. Vertical infrastructure such as overhead wires, pylons and lighting poles are visible over the wall. Tree canopies along the northern application site boundary are also visible as are the Dublin Mountains in the very rear of this incoherent view.

The properties located along The Dale are situated at a higher elevation than the street and Katherine Tynan Road, which affords a position where it is likely that residential receptors overlook Cookstown Industrial Estate and Belgard LUAS stop.

Overall, this view is over a transitional landscape between a low-density residential area, a movement corridor, and industrial lands. There is very little tree cover and the views to the Dublin Mountains appear almost incidental. The most distinctive feature in the view is the prominent LUAS stop canopy which breaks the horizon above the mountains.

The sensitivity of the receptor is <u>High</u> to reflect everyday views from the front elevations of residential properties.

Visual Impacts and Effects

The view would change to include the upper stories of the northern edge of the development which would be visible over the remaining industrial buildings located inbetween the development lands and the viewpoint. The strong verticality of the proposed architecture is particularly effective at breaking down the mass of the proposed blocks when viewed from this receptor. Glimpses of the Dublin Mountains would still be possible when looking south down the proposed streets. Over time, the tree planting along these streets would mature to soften the spaces between the buildings.

The changes in this view are limited to the middle third of the view and do not exceed the height of the LUAS stop canopy structure (in the 50mm view). Block A (visible in the wide-angle view), by law of proximity appears higher in the view but does not exceed the height of the LUAS overhead wires. The development signifies the beginnings of a strong piece of urban place-making and ties in with the character of the LUAS stop. The urban edge proposed here compliments the residential land uses north of Katherine Tynan Road better than the present Industrial estate and introduces sense of enclosure and coherence to this part of Tallaght.

Over time, the tree planting proposed along the northern edge of the scheme will mature to obscure views towards the apartments resulting in a greener outlook.

The magnitude of change would be High. *(Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features)* and would remain so in the **Short, Medium and Long Term.**

The effect is Significant.

Qualitatively the effect would be Neutral *(Scheme complements the scale, landform and pattern of the townscape and maintains quality.* Over time in the **long-term** as the proposed network of trees mature, this would improve to **Beneficial.**

Whilst there is some erosion of the prospect of the Dublin Mountains the development is also part of the beneficial change of the middle ground view from industrial to urban / residential, and, like the LUAS station and tram line part of urban place-making and improved infrastructure occurring for the area.

Over time, as the Tallaght Town Centre Local Area Plan is realised, only Block A would be visible to the right of the wide-angle view. The full façade of blocks C and D would be obscured by planned future development therefore reducing the magnitude of change effecting this receptor due to this development.

Viewpoint 12 – Belgard LUAS stop

Existing View

This view from the LUAS stop looks southwest towards the site, which is approximately 45m away. The view is representative of views experienced while waiting for, stepping off and travelling on LUAS trains. It also represents the views experienced walking from the LUAS stop to the proposed development.

Plate 21: View southwest from Belgard LUAS stop

The LUAS station and associated infrastructure is the most prominent feature in this view. The access road which connects through to the application site is visible to the left-hand side of the station. A scrubby verge flanks it to the left. Cookstown industrial Estate is clearly visible, at close proximity behind palisade security fencing to the left of the access road. Here, the buildings are one to two storeys high. The buildings located directly within the application site boundary are currently screened by tree planting, however, the lands to the north of the application site, around the existing pylon are clearly discernible to the right-hand side of the view at the end of the LUAS station. The connecting pylon is visible along the left-side of the view and overhead wires are visible between the structures. Lighting poles associated with the LUAS further break up the skyline. The Dublin Mountains can be seen in the far distance.

Overall, this is a view that contains two townscape characters – the new, smart and contemporary development around the LUAS and the industrial lands to the left. The visual quality of the industrial lands is notably poorer than the quality of the LUAS station.

The sensitivity of the receptor is Medium to reflect the slow speeds that people will be travelling at when using and approaching the LUAS stop. Although the landscape and views will not be the focus of daily activities here and the current outlook is poor, the landscape backdrop will have an effect of the quality of the experience here. The LUAS stop itself is a new land-mark feature, part of place-making as part of the expected enhancement of the area and therefore there would be expectations as to the visual quality of setting and sense of place.

Visual Impacts and Effects

The view would change to include the north-facing elevations of the scheme, which will be visible above the existing industrial units. These would remain until the remainder of the Tallaght Town Centre Local Area Plan is realised and until then, would, along with the unkempt landscape treatment around the existing pylon north of the development, detract from the quality of the proposed scheme. The proposed buildings would wrap around these units and form an urban edge, enclosing the view. The proposed buildings, while are higher than the existing built form, are in keeping with the character and quality proposed in the Tallaght Town Centre Local Area Plan and compliment the contemporary design of the LUAS stop.

The magnitude of change would be <u>High</u> *(Extensive intrusion of the development in the view),* and would remain so in the **<u>Short, Medium and Long Term.</u>**

The Significance of the effect is <u>Significant.</u>

Qualitatively the effect would be <u>Beneficial</u> *(The scheme– improves townscape quality and character, fits with the scale, landform and pattern and enables the restoration of valued characteristic features).*

Viewpoint 13 – Hospital LUAS stop / Cookstown Way

Existing View

This view from Cookstown Way looks northeast towards the site, which is approximately 775m away. The view is representative of views experienced while using the LUAS and road here.

Plate 22: View NE from Cookstown Way

Cookstown Way and LUAS corridor that dominate the foreground of this view. The movement corridor is well vegetated and there are few long-range views available. Tallaght University Hospital is visible through the trees, which are deciduous and so bare in winter. At present, there are no features located within or adjacent to the application site visible in this view.

Overall, the view is of an attractive and well-vegetated suburban movement corridor.

The sensitivity of the receptor is <u>Medium</u> to reflect the slow speeds that people will be travelling at when using and approaching the LUAS stop. Although the landscape and views will not be the focus of daily activities here the landscape backdrop will have an effect of the quality of the experience here. The LUAS stop itself is a new land-mark feature, part of place-making as part of the expected enhancement of the area and therefore there would be expectations as to the visual quality of setting and sense of place.

Visual Impacts and Effects

The indicative view represented by the verified view photography and montages would not change because the development is mostly screened by existing vegetation and buildings located between the viewpoint and the application lands.

The magnitude of change would be <u>Negligible</u> *(Barely discernible intrusion of the development into the view)* and would remain so in the **<u>Short, Medium and Long Term.</u>**

The effect is <u>Not Significant.</u>

Qualitatively the effect would be <u>Neutral</u> *(Maintains quality).*

12.10.3 Summary of Effects on Visual Receptors

The following table summarises the results of the assessment of the effects of the proposed development on the visual resource.

Landscape Character Area	Sensitivity	Significance, Term and Quality				
		Assessment Categories	Construction Phase – temporary effects	Operational Phase		
				Short-term effects (up to 7 years)	Medium-term effects (7-15 years)	Long term effects (15 years and beyond)
VP01. Belgard Community Centre	Medium	**Magnitude of Change**	Medium	Medium		
		Significance of Effect	Moderate	Moderate		
		Qualitative Assessment	Adverse	Neutral		
VP02. Parkhill Road	High	**Magnitude of Change**	Medium	Medium		
		Significance of Effect	Significant	Significant		
		Qualitative Assessment	Adverse	Beneficial		
VP03 Redwood Public Open Space	High	**Magnitude of Change**	Medium	Medium	Low	
		Significance of Effect	Significant	Significant	Moderate-Slight	
		Qualitative Assessment	Adverse	Adverse	Beneficial	
VP04 Mayberry Road and Belgard Road intersection	Medium	**Magnitude of Change**	Medium	Medium		
		Significance of Effect	Moderate	Moderate		
		Qualitative Assessment	Adverse	Beneficial		
VP05 Institute of Technology Tallaght.	High	**Magnitude of Change**	Negligible	Negligible		
		Significance of Effect	Slight-Not Significant	Slight-Not Significant		
		Qualitative Assessment	Adverse	Neutral		
VP06 Belgard Square North.	High	**Magnitude of Change**	Low	Low		
		Significance of Effect	Moderate-Slight	Moderate-Slight		
		Qualitative Assessment	Adverse	Beneficial		
VP07 Cookstown Road and Second Avenue intersection	Negligible	**Magnitude of Change**	High	High		
		Significance of Effect	Slight-Not Significant	Slight-Not Significant		
		Qualitative Assessment	Adverse	Beneficial		

VP08 - Lanndale Lawns public open space	Medium	**Magnitude of Change**	Negligible	Negligible	
		Significance of Effect	Not Significant	Slight-Not Significant	
		Qualitative Assessment	Adverse	Neutral	
Medium Moderate Beneficial	Low	**Magnitude of Change**	Low	Medium	
		Significance of Effect	Not Significant	Slight	
		Qualitative Assessment	Adverse	Beneficial	
VP10 - The Meadows West	High	**Magnitude of Change**	Low	Low	
		Significance of Effect	Moderate-Slight	Moderate-Slight	
		Qualitative Assessment	Adverse	Neutral	
VP11 - The Dale	High	**Magnitude of Change**	High	High	
		Significance of Effect	Significant	Significant	
		Qualitative Assessment	Adverse	Neutral	Beneficial
VP12 - Belgard LUAS stop	Medium	**Magnitude of Change**	High	High	
		Significance of Effect	Significant	Significant	
		Qualitative Assessment	Adverse	Beneficial	
VP13 – Cookstown Way / Hospital Luas stop	Medium	**Magnitude of Change**	Negligible	Negligible	
		Significance of Effect	Not Significant	Slight-Not Significant	
		Qualitative Assessment	Adverse	Neutral	

Table 12.9 Summary of Visual Effects

The proposed development is expected to have a temporary adverse effect on the visual resource during construction. Upon operation and into the future, the development is expected to have a neutral or beneficial long term / permanent effect on the visual resource.

12.11 Monitoring

12.11.1 Construction Phase

Landscape tender drawings and specifications will be produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect.

The planting works will be undertaken in the next available planting season after completion of the main civil engineering and building work.

12.11.2 Operational Phase

This will consist of weed control, replacement planting, pruning etc. All landscape works will be in an establishment phase for the initial three years from planting. The company responsible for site management of the scheme will be responsible for the ongoing maintenance of the site after this three-year period is complete.

12.12 Reinstatement

The proposed landscape development works in the form of tree and shrub planting will be used to re-instate the site, post-construction. These works will be carried out by an appointed landscape contractor and will be supervised by a suitably qualified landscape architect or manager

12.13 Conclusion

This LVIA has assessed the impact of the proposed residential development at the application site on Cookstown Road, Tallaght, County Dublin. The subject lands are zoned for redevelopment and the proposed application meets that need. A high-quality proposal has been submitted that adheres to local planning policy and has been developed with the aim of the provision of an excellent place to live. The design process has incorporated into it several mitigative measures (see section 12.8) that have contributed towards the positive conclusions reached within the assessments included in sections 12.9 and 12.10.

Landscape Effects

The predicted landscape effects on both the site context, Cookstown industrial landscape and the subject lands themselves have been assessed as ‘Beneficial’ at operation and in the long-term once the landscape proposals have matured. See section 03 for a summary table (table 6) of the predicted landscape effects.

Visual Effects

The proposed development is expected to have a temporary adverse effect on the visual resource during construction. Upon operation and into the future, the development is expected to have a neutral or beneficial long term / permanent effect on the visual resource. See section 03 for a summary table (Table 12.9) of the predicted visual effects.

13.0 WIND AND MICROCLIMATE

13.1 Introduction

B-Fluid Limited has been commissioned to carry out a Wind and Micro-climate Modelling Study for Cookstown Castle Development in Cookstown, Tallaght, Dublin 24.

This Chapter is completed by Dr. Cristina Paduano, Dr. Eleonora Neri and Dr. Arman Safdari.

Dr. Cristina Paduano is a Chartered Engineer (CEng) and member of Engineers Ireland who specialises in computational fluid dynamics applications for urban environment and the con-struction industry with over 10 years experience. She holds a PhD in Mechanical Engineering from Trinity College Dublin, with M.Eng and B.Eng in Aerospace Engineering.

Dr. Eleonora Neri is a Chartered Engineer (CEng) and member of Engineers Ireland who specialises in computational fluid dynamics applications for the urban environment and in wind tunnel measurements for the aerospace industry. She holds a PhD in Aeroacoustics from Trinity College Dublin, a M.Sc. and B.Sc. in Aeronautical Engineering.

Dr. Arman Safdari is a CFD Moelling Engineer who specialises in computational fluid dynamics applications. He is an expert in airflow modeling, heat and mass transfer and multi-phase flow simulations. He holds a PhD in Mechanical Engineering from Pusan National University, a M.Sc. and B.Sc. in Mechanical Engineering.

Wind and Micro-climate study identifies the possible wind patterns around the existing environment and proposed development, under mean and peak wind conditions typically occurring in Dublin.

This assessment is performed through Advanced Computational Fluid Dynamics (CFD) which is a numerical method used to simulate wind conditions and its impact on the development and to identify areas of concern in terms of downwash/funneling/downdraft/critical flow accelerations that may likely occur. The Advanced CFD numerical algorithms applied here are solved using high speed supercomputing computer clusters.

These results will be utilized by Hughes Planning and Development Consultants design team to configure the optimal layout for Cookstown Castle Development for the aim of achieving a high-quality environment for the scope of use intended of each areas/building (i.e. comfortable and pleasant for potential pedestrian) and not to introduce any critical wind impact on the surrounding areas and on the existing buildings.

The next sections describes in details the wind and microclimate modelling performed, it’s methodology and assumptions which B-Fluid Ltd. has adopted for this study, together with impacts of the proposed development on the existing environment.

13.1.1 Objective of Wind and Microclimate Modelling

CFD wind modelling is adopted to identify areas of concern in terms of critical flows and areas where pedestrian safety and comfort could be compromised. Pedestrian Wind Comfort and Safety Studies are conducted to predict, assess and, where necessary, mitigate the impact of the residential development on pedestrian level wind conditions. The objective is to maintain comfortable and safe pedestrian level wind conditions that are appropriate for the season and the intended use of pedestrian areas. Pedestrian areas include side-walks, street frontages, pathways, building entrance areas, open spaces, amenity areas, outdoor sitting areas, and accessible roof top areas among others.

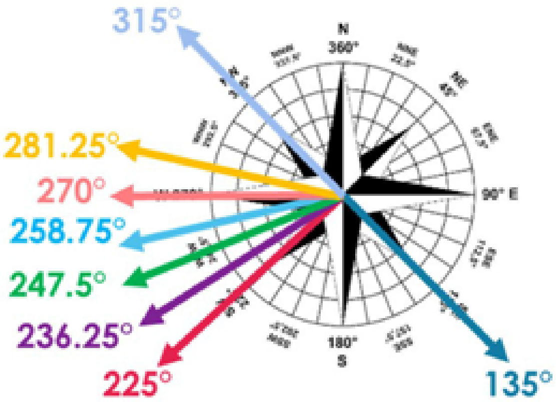
For this purpose, 18 different wind scenarios and directions have been modelled as shown in Table 1.1 in order to take into consideration all the different relevant wind directions. In particular, a total of 18 compass directions on the wind rose are selected. For each direction, the reference wind speed is set to the 5%

exceedance wind speed for that direction, i.e. the wind speed that is exceeded for over 5% of the time whenever that wind direction occurs.

DUBLIN WIND SCENARIOS AND DIRECTIONS		
Velocity (m=s)	Direction (deg)	Frequency
5.601	225	11.233
4.626	135	6.849
5.847	236.25	6.792
6.049	258.75	6.747
6.034	247.5	6.689
5.888	270	5.662
4.994	315	4.338
5.503	281.25	3.904
4.974	292.5	3.436
5.357	213.75	3.288
4.736	123.75	3.105
4.406	146.25	2.751
5.101	303.75	2.648
5.246	112.5	2.500
4.121	157.5	2.386
4.581	101.25	2.340
4.169	45	2.180
3.558	90	2.135

Table 13.1 Summary of the 18 Wind Scenarios Modelled for Cookstown Castle Development

This modelling study focuses on reporting 8 worst case and most relevant wind speeds, which are the speeds and directions showing the most critical wind speeds relevant to the development. The 8 modelled scenarios reported in this study are presented in Figure 13.2.



Velocity (m/s)	Direction (°)	Frequency
5.601	225	11.233
4.626	135	6.849
5.847	236.25	6.792
6.049	258.75	6.747
6.034	247.5	6.689
5.888	270	5.662
4.994	315	4.338
5.503	281.25	3.904

Figure 13.2 Summary of 8 Wind Scenarios Reported

13.1.2 Regulations

Good wind microclimate conditions are necessary for creating outstanding public spaces. Adverse wind effects can reduce the quality and usability of outdoor areas, and lead to safety concerns in extreme cases.

Usually, the recommended approach to wind microclimate studies is based on the building height, as presented in Figure 13.3.

Building Height	Recommended Approach to Wind Microclimate Studies
Similar or lower than the average height of surrounding buildings **Up to 25m**	Wind studies are not required, unless sensitive pedestrian activities are intended (e.g. around hospitals, transport hubs, etc.) or the project is located on an exposed location
Up to double the average height of surrounding buildings **25m to 50m**	Computational (CFD) Simulations **OR** Wind Tunnel Testing
Up to 4 times the average height of surrounding buildings **50m to 100m**	Computational (CFD) Simulations **AND** Wind Tunnel Testing
High Rise **Above 100m**	**Early Stage Massing Optimization:** Wind Tunnel Testing OR Computational (CFD) Simulations **Detailed Design:** Wind Tunnel Testing **AND** Computational (CFD) Simulations to demonstrate the performance of the final building design

Figure 13.3 Recommended Approach to Wind Microclimate Studies based on Building Height, as prescribed by the Wind Microclimate Guidelines for Developments in the City of London (August 2019)

Computational fluid dynamics (CFD) tools can create high quality output that provide a good understanding of fundamental flow features. The CFD models must include a detailed three-dimensional representation of the proposed development.

Maximum cell sizes near critical locations (e.g. entrances, corners, etc.) must be 0.3m or smaller. Sufficient cells should be also used between buildings with a minimum of 10 across a street canyon. However, the cell size of buildings away from the target can be larger to allow for modelling efficiency. The CFD models should represent all surrounding buildings that are within 400m from the centre of the site. Other taller buildings outside of this zone that could have an influence on wind conditions within the project site should be included for wind directions where they are upwind of the project site. The models must contain at least 3 prism layers below 1.5m height, to capture near-ground effects.

CFD analysis also reports conditions in areas away from the site where cumulative effects of a cluster of tall buildings could lead to adverse wind conditions.

13.2 Assessment Methodology

13.2.1 Study Methodology

Acceptance Criteria

Pedestrian Comfort

Pedestrian Wind Comfort is measured in function of the frequency of wind speed threshold exceeded based on the pedestrian activity. The assessment of pedestrian level wind conditions requires a standard against which measured or expected wind velocities can be compared.

Only gust winds are considered in the safety criterion. These are usually rare events but deserve special attention in city planning and building design due to their potential impact on pedestrian safety. Gusts cause the majority of cases of annoyance and distress and are assessed in addition to average wind speeds. Gust speeds should be divided by 1.85 and these ”gust equivalent mean” (GEM) speeds are compared to the same criteria as for the mean hourly wind speeds. This avoids the need for different criteria for mean and gust wind speeds.

The following criteria are widely accepted by municipal authorities as well as the international building design and city planning community:

- DISCOMFORT CRITERIA: Relates to the activity of the individual.
  Onset of discomfort:
  - Depends on the activity in which the individual is engaged and is defined in terms of a mean hourly wind speed (or GEM) which is exceeded for 5% of the time.
- DISTRESS CRITERIA: Relates to the physical well-being of the individual.
  Onset of distress:
  - ‘Frail Person Or Cyclist’: equivalent to an hourly mean speed of 15 m/s and a gust speed of 28 m/s (62 mph) to be exceeded less often than once a year. This is intended to identify wind conditions which less able individuals or cyclists may find physically difficult. Conditions in excess of this limit may be acceptable for optional routes and routes which less physically able individuals are unlikely to use.
  - ‘General Public’: A mean speed of 20 m/s and a gust speed of 37 m/s (83 mph) to be exceeded less often than once a year. Beyond this gust speed, aerodynamic forces approach body weight and it rapidly becomes impossible for anyone to remain standing. Where wind speeds exceed these values, pedestrian access should be discouraged.

The above criteria set out six pedestrian activities and notes that calm activity requires calm wind conditions, which are summarised by the Lawson scale, shown in Figure 2.1. The Lawson scale assesses pedestrian wind comfort in absolute terms and defines the reaction of an average person to the wind. Each wind type is associated to a number, corresponding to the Beaufort scale, which is represented in Figure 2.2. The Beaufort scale is an empirical measure that relates wind speed to observed conditions at sea or on land. A 20% exceedance is used in these criteria to determine the comfort category, which suggests that wind speeds would be comfortable for the corresponding activity at least 80% of the time or four out of five days.

These criteria for wind forces represent average wind tolerances. They are subjective and variable depending on thermal conditions, age, health, clothing, etc. which can all affect a person's perception of a local microclimate. Moreover, pedestrian activity alters between winter and summer months. The criteria assume that people will be suitably dressed for the time of year and individual activity. It is reasonable to assume, for instance, that areas designated for outdoor seating will not be used on the windiest days of the year.

Weather data measured are used to calculate how often a given wind speed will occur each year over a specified area. Pedestrian comfort criteria are assessed at 1.5m above ground level. Unless in extremely unusual circumstances, velocities at pedestrian level increase as you go higher from ground level.

A breach of the distress criteria requires a consideration of:

- whether the location is on a major route through the complex,
- whether there are suitable alternate routes which are not distressful.

If the predicted wind conditions exceed the threshold, then conditions are unacceptable for the type of pedestrian activity and mitigation measure should be implemented into the design.

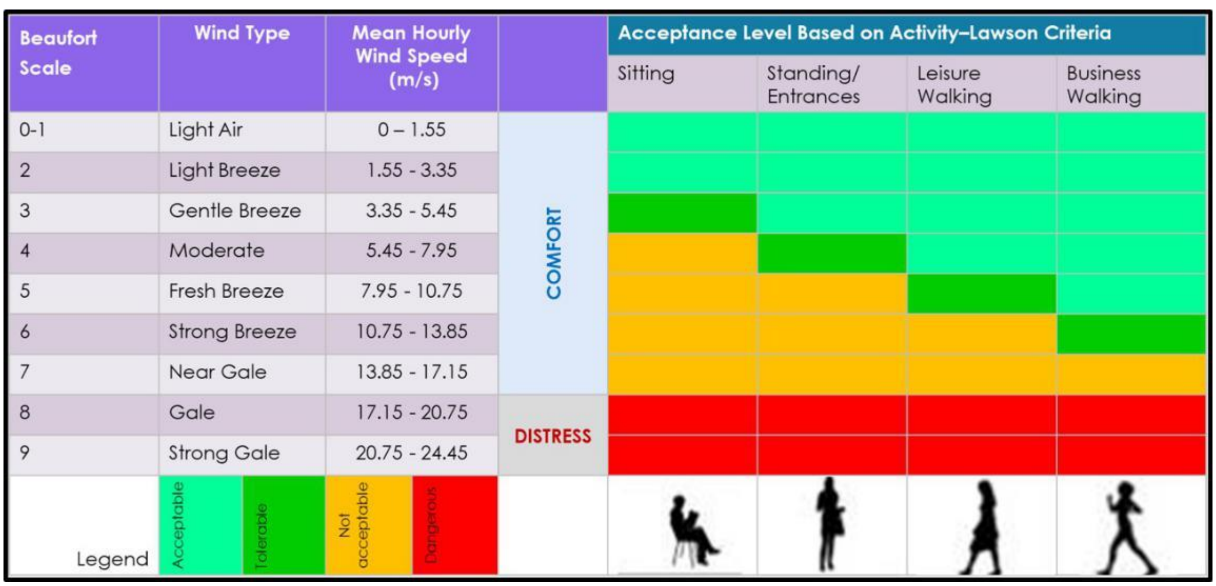
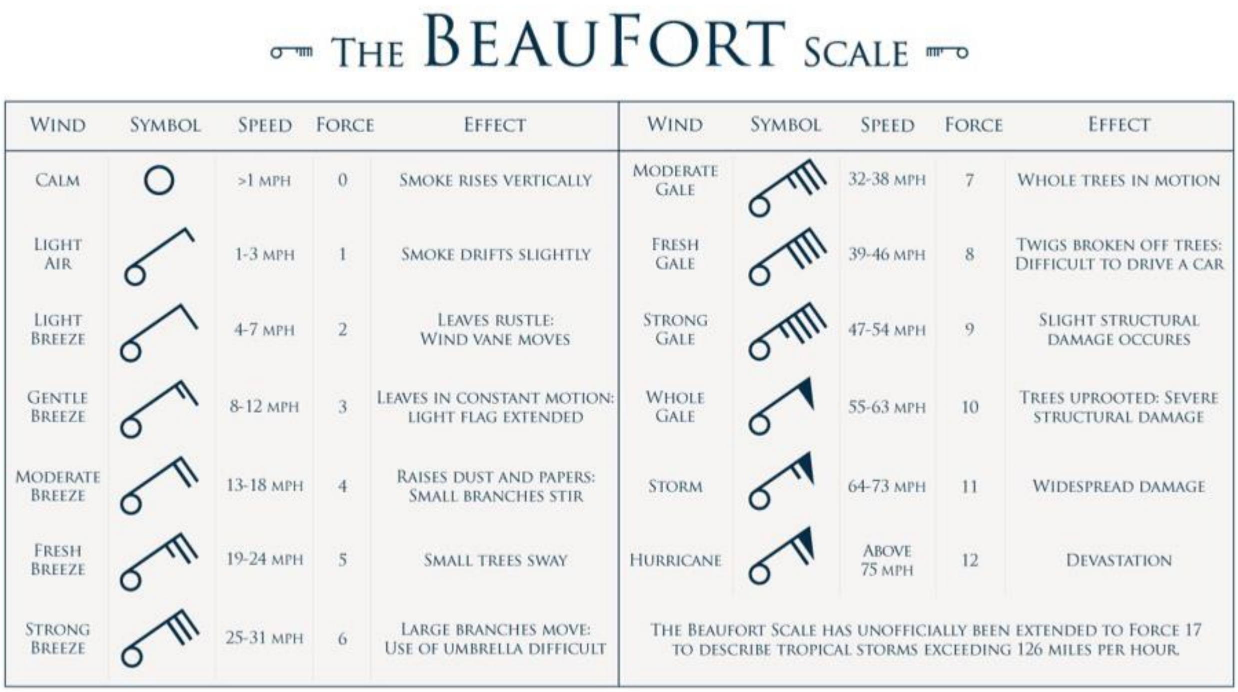


Figure 13.4 Lawson Scale



THE BEAUFORT SCALE

WIND	SYMBOL	SPEED	FORCE	EFFECT	WIND	SYMBOL	SPEED	FORCE	EFFECT
CALM		>1 MPH	0	SMOKE RISES VERTICALLY	MODERATE GALE		32-38 MPH	7	WHOLE TREES IN MOTION
LIGHT AIR		1-3 MPH	1	SMOKE DRIFTS SLIGHTLY	FRESH GALE		39-46 MPH	8	TWIGS BROKEN OFF TREES: DIFFICULT TO DRIVE A CAR
LIGHT BREEZE		4-7 MPH	2	LEAVES RUSTLE: WIND VANE MOVES	STRONG GALE		47-54 MPH	9	SLIGHT STRUCTURAL DAMAGE OCCURES
GENTLE BREEZE		8-12 MPH	3	LEAVES IN CONSTANT MOTION: LIGHT FLAG EXTENDED	WHOLE GALE		55-63 MPH	10	TREES UPROOTED: SEVERE STRUCTURAL DAMAGE
MODERATE BREEZE		13-18 MPH	4	RAISES DUST AND PAPERS: SMALL BRANCHES STIR	STORM		64-73 MPH	11	WIDESPREAD DAMAGE
FRESH BREEZE		19-24 MPH	5	SMALL TREES SWAY	HURRICANE		ABOVE 75 MPH	12	DEVASTATION
STRONG BREEZE		25-31 MPH	6	LARGE BRANCHES MOVE: USE OF UMBRELLA DIFFICULT	THE BEAUFORT SCALE HAS UNOFFICIALLY BEEN EXTENDED TO FORCE 17 TO DESCRIBE TROPICAL STORMS EXCEEDING 126 MILES PER HOUR.				

Figure 13.5 Beaufort Scale

CFD Modelling Method

Computational Fluid Dynamics (CFD) is a numerical technique used to simulate fluid flow, heat and mass transfer, chemical reaction and combustion, multiphase flow, and other phenomena related to fluid flows. CFD modelling includes three main stage: pre-processing, simulation and post-processing as described in Figure 2.3. The Navier-Stokes equations, used within CFD analysis, are based entirely on the application of fundamental laws of physics and therefore produce extremely accurate results provided that the scenario modelled is a good representation of reality.

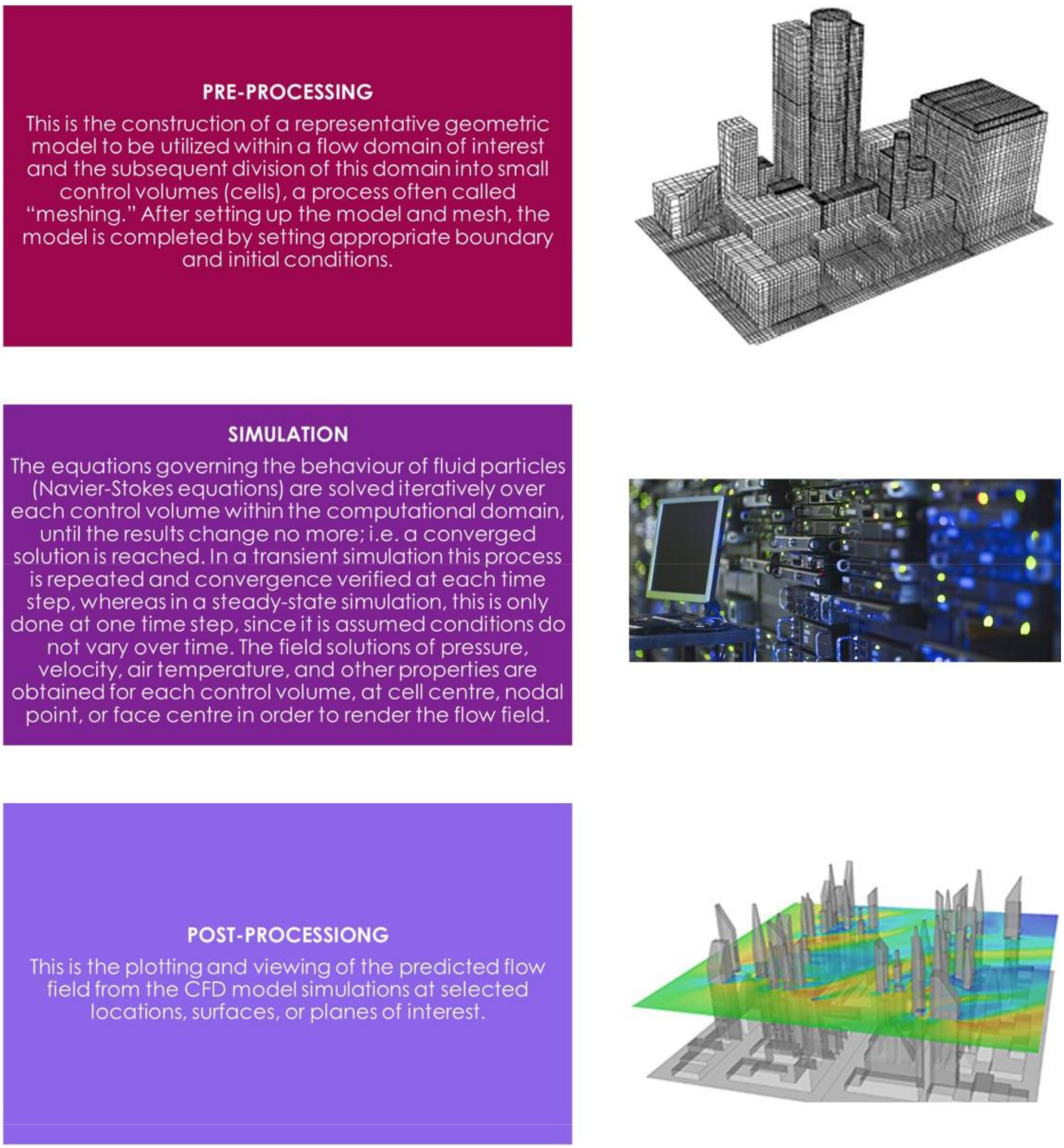


Figure 13.6 CFD Modelling Process Explanation

OpenFOAM Numerical Solver Details

This report employs OpenFoam Code, which is based on a volume averaging method of discretization and uses the post-processing visualisation toolkit Paraview version 5.5. OpenFoam is a CFD software code released and developed primarily by OpenCFD Ltd, since 2004. It has a large user base across most areas of engineering and science, from both commercial and academic organisations.

OpenFOAM CFD code has capabilities of utilizing a Reynolds Averaged Navier-Stokes (RANS) approach, Unsteady Reynolds Averaged Navier-Stokes (URANS) approach, Detached Eddy Simulation

(DES) approach, Large Eddy Simulation (LES) approach or the Direct Numerical Simulation (DNS) approach, which are all used to solve anything from complex fluid flows involving chemical reactions, turbulence and heat transfer, to acoustics, solid mechanics and electromagnetics. Quality assurance is based on rigorous testing. The process of code evaluation, verification and validation includes several hundred daily unit tests, a medium-sized test battery run on a weekly basis, and large industry-based test battery run prior to new version releases. Tests are designed to assess regression behaviour, memory usage, code performance and scalability.

The OpenFOAM solver algorithm directly solves the mass and momentum equations for the large eddies that comprise most of the fluid's energy. By solving the large eddies directly no error is introduced into the calculation.

To reduce computational time and associated costs the small eddies within the flow have been solved using the widely used and recognised Smagorinsky Sub-Grid Scale (SGS) model. The small eddies only comprise a small proportion of the fluids energy therefore the errors introduced through the modelling of this component are minimal.

The error introduced by modelling the small eddies can be considered of an acceptable level. Computational time will be reduced by modelling the small eddies (compared to directly solving).

13.3 Receiving Environment

13.3.1 Existing Receiving Environment Assessment

In this chapter, wind impact has been assessed on the existing receiving environment considered as the existing buildings and the topography of the site prior to construction of the proposed development. A statistical analysis of 30 years historical weather wind data has been carried out to assess the most critical wind speeds, directions and frequency of occurrence of the same. The aim of this assessment has been to identify the wind microclimate of the area that may cause critical conditions for pedestrians comfort criteria.

Site Location and Surrounding Area

Cookstown Castle Development will be located in Cookstown, Tallaght, Dublin 24. The development is in a very prominent position, close to the Belgard Road and to the M50 motorway, approximately 9km southwest of Dublin City Centre.

The Existing Environment site is shown in Figure 13.7. The area considered for the existing environment and proposed development assessment comprises a 3km² area around the Cookstown Castle Development as represented in Figure 13.8.

Figure 13.7 Cookstown Castle Development Site Location and Existing Environment

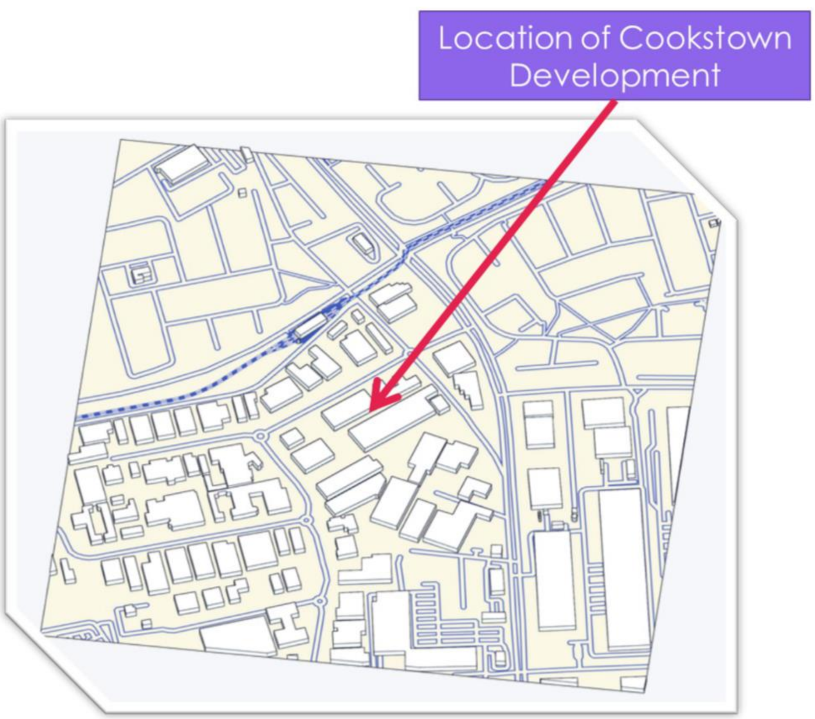


Figure 13.8 Extents of Analysed Existing Environment Around Cookstown Castle Development

Topography and Built In Environment

Figure 3.9 shows an aerial photograph of the terrain surrounding the construction site at Cookstown Castle Development.

The Cookstown Castle Site is located in Cookstown, Tallaght, Dublin 24, approximately 9km southwest of Dublin City Centre.

The area surrounding the site can be characterised as urban environment. Some shelter effect can be expected for wind approaching from directions within this sector. All the wind directions considered for this study are in this connection “urban winds” and no distinction will be made between them.

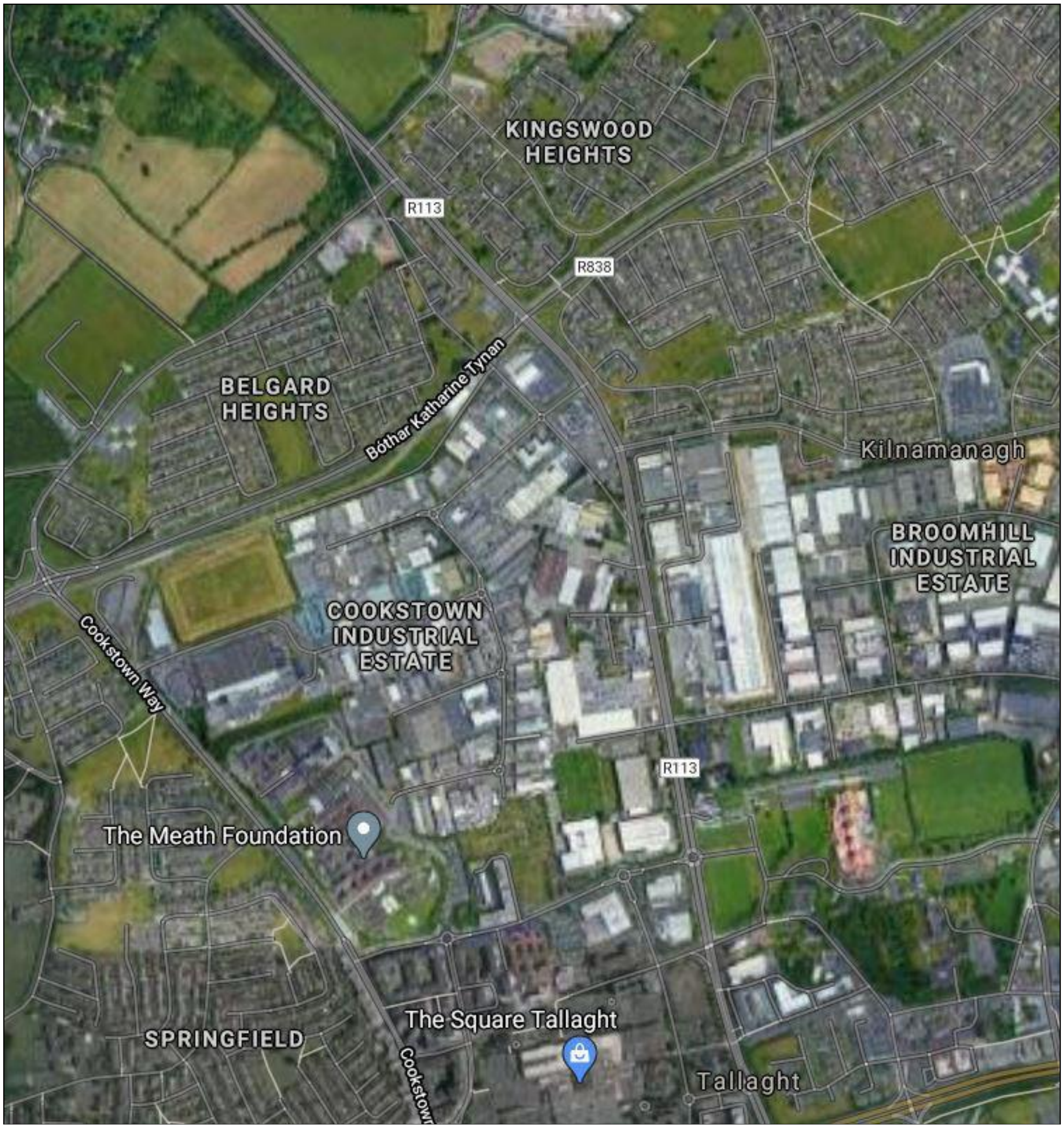


Figure 13.9 Built-in Environment Around Construction Site at Cookstown Castle Development

Wind and Microclimate Conditions

This analysis considers the existing environment being exposed to typical wind conditions of the site. The buildings are oriented as shown in the previous sections. The wind profile is built using the annual average of meteorology data collected at Dublin Airport Weather Station. Figure 3.10 shows on the map the position of Cookstown Castle Development and the position of Dublin Airport.

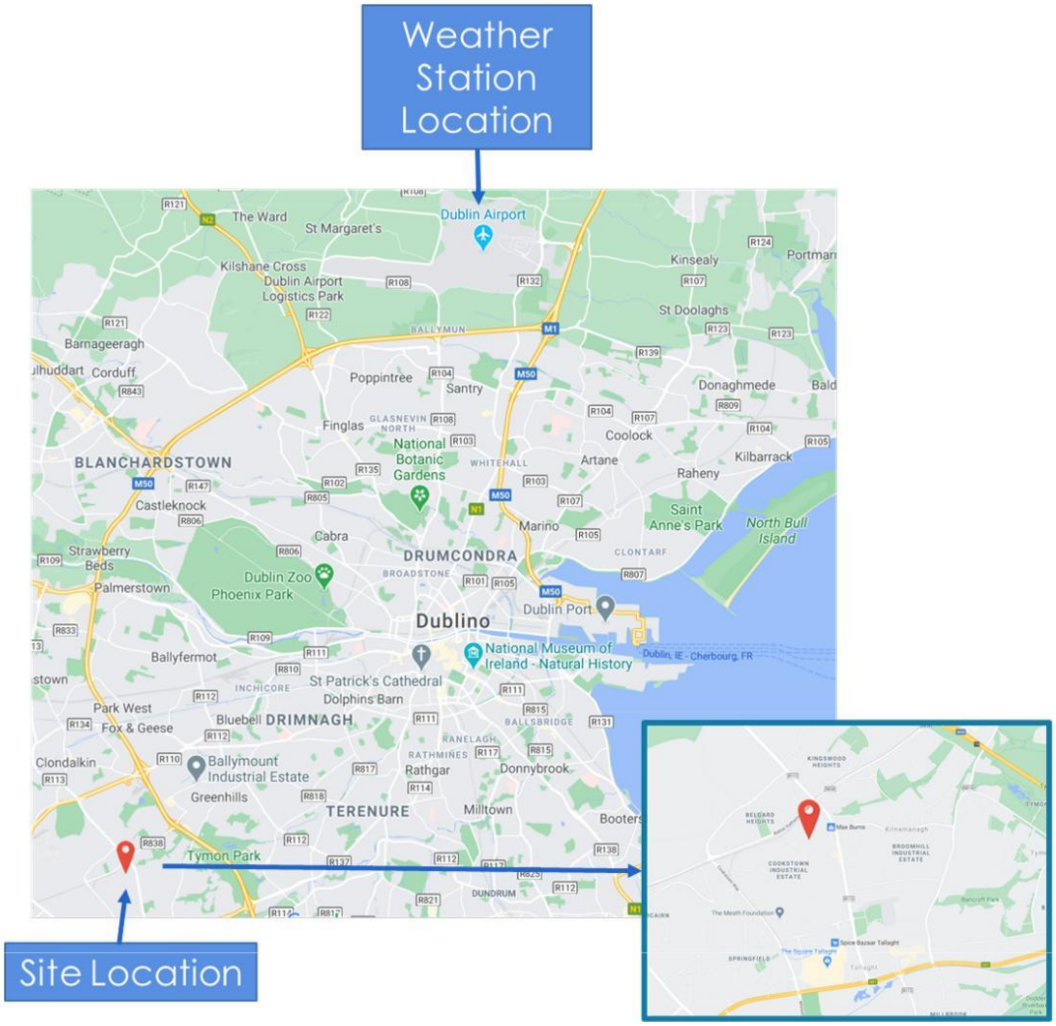


Figure 13.10 Map showing the position of Cookstown Castle Development and Dublin Airport

Regarding the transferability of the available wind climate data, the following considerations have been made:

- **Terrain:** The meteorological station is located in the flat open terrain of the airport, whereas the development site is located in urban area with dense built-in structure with buildings of at least 15m height in average.

- **Mean Wind Speeds:** Due to the different terrain environment, the ground-near wind speeds (at pedestrian level) will be lower at the construction site compared to the meteorological station at the airport.

- **Wind Directions:** The landscape around the development site can in principle be characterized as flat terrain. Isolated elevations in the near area of the development should have no influence on the wind speed and wind directions. With respect to the general wind climate no significant influence is expected. Based on the above considerations it can be concluded that the data from the meteorological station at Dublin Airport are applicable for the desktop assessment of the wind comfort at the development site.

Wind Conditions

The assessment of the wind comfort conditions at the new development will be based on the dominating wind directions throughout a year (annual wind statistic).

As stated above, the local wind climate is determined from historical meteorological data recorded at Dublin Airport. Two different data sets are analyzed for this assessment as follows:

- The meteorological data associated with the maximum daily wind speeds recorded over a 30 year period between 1985 and 2015 and,
- The mean hourly wind speeds recorded over a 10 year period between 2005 and 2015. The data is recorded at a weather station at the airport, which is located 10m above ground or 71mOD.

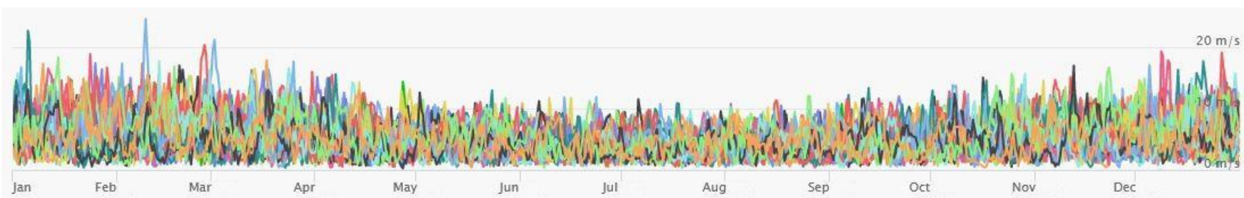


Figure 13.11 Local Wind Speed (10m) - 1985-2020

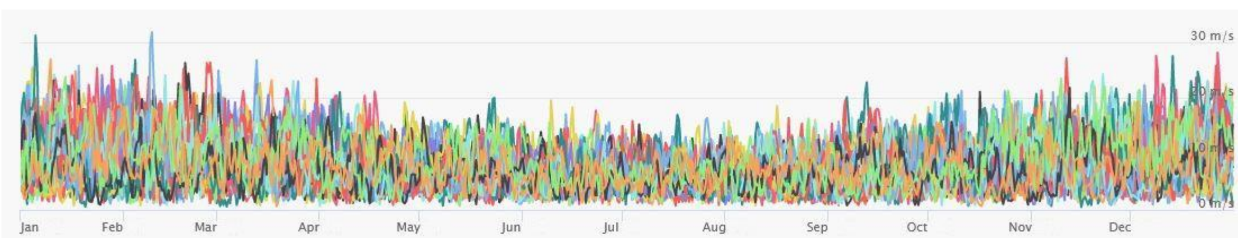


Figure 13.12 Local Wind Gust (10m) - 1985-2020

Figure 3.11, presenting the wind speed diagram for Dublin, shows the days per month, during which the wind reaches a certain speed. In Figure 3.12, the wind rose for Dublin shows how many hours per year the wind blows from the indicated direction, confirming how the predominant directions are WSW, W, and SW.

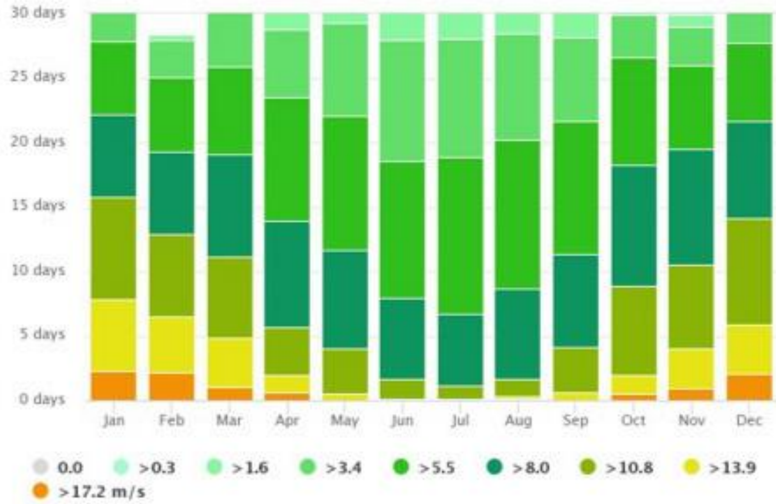


Figure 13.13 Dublin Wind Speed Diagram

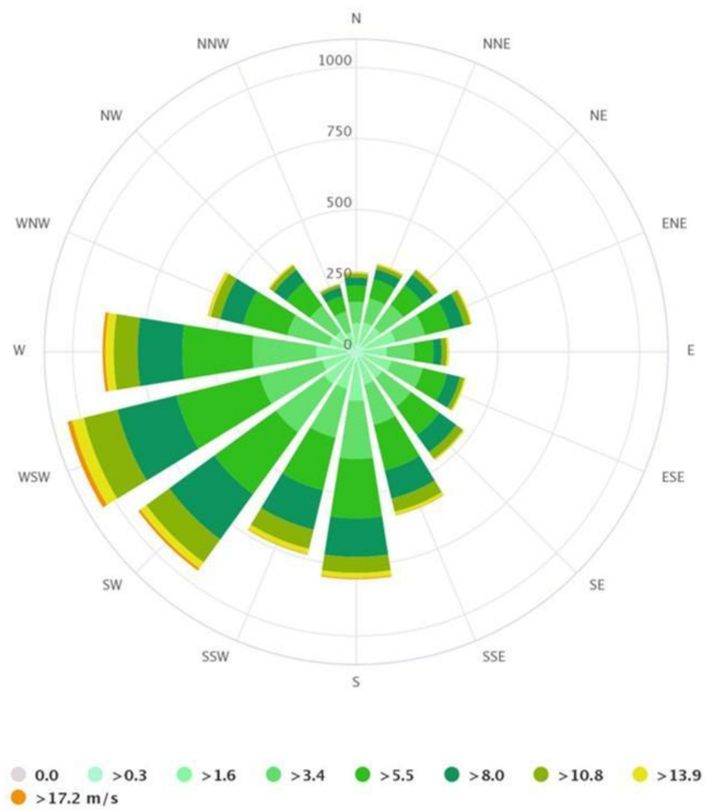


Figure 13.14 Dublin Wind Rose

Based on the criterion of occurrence frequency the main wind directions are presented in Figure 3.9 and listed below in descending order of dominance:

1. South-West with most frequent wind speeds around 6m/s (all year).
2. South-East
3. West-South-West.

The analysis will mainly focus on the large sector of prevailing wind directions of winds from above. Other wind directions will be discussed if deemed necessary for the study.

Velocity (m/s)	Direction (°)	Frequency
5.601	225	11.233
4.626	135	6.849
5.847	236.25	6.792
6.049	258.75	6.747
6.034	247.5	6.689
5.888	270	5.662
4.994	315	4.338
5.503	281.25	3.904
4.974	292.5	3.436
5.357	213.75	3.288
4.736	123.75	3.105
4.406	146.25	2.751
5.101	303.75	2.648
5.246	112.5	2.500
4.121	157.5	2.386
4.581	101.25	2.340
4.169	45	2.180
3.558	90	2.135
4.801	202.5	2.021
3.689	78.75	1.963
3.627	168.75	1.495
4.285	67.5	1.370
4.863	56.25	1.279
4.042	191.25	1.199
4.630	326.25	1.164
3.844	11.25	1.142
4.418	337.5	1.062
4.787	348.75	0.982
4.006	22.5	0.959
3.555	180	0.879
4.059	33.75	0.845
0.700	0	0.011
Selected Conditions : **32**	Total Coverage : **95.35 %**	

Figure 13.15 Main Wind Directions Occurrence Frequency

Mean and Maximum Wind Conditions

Examination of the daily wind data reveals that the wind predominantly blows from West and Southwest directions, however, there is a secondary wind from the Southeast. It is apparent that winds from other directions are rare. Maximum daily wind speeds of nearly 30 m/s were recorded in the past 30 years, however, the maximum daily winds are commonly found between 6 m/s and 15 m/s. the strongest winds arise from the West and Southwest.

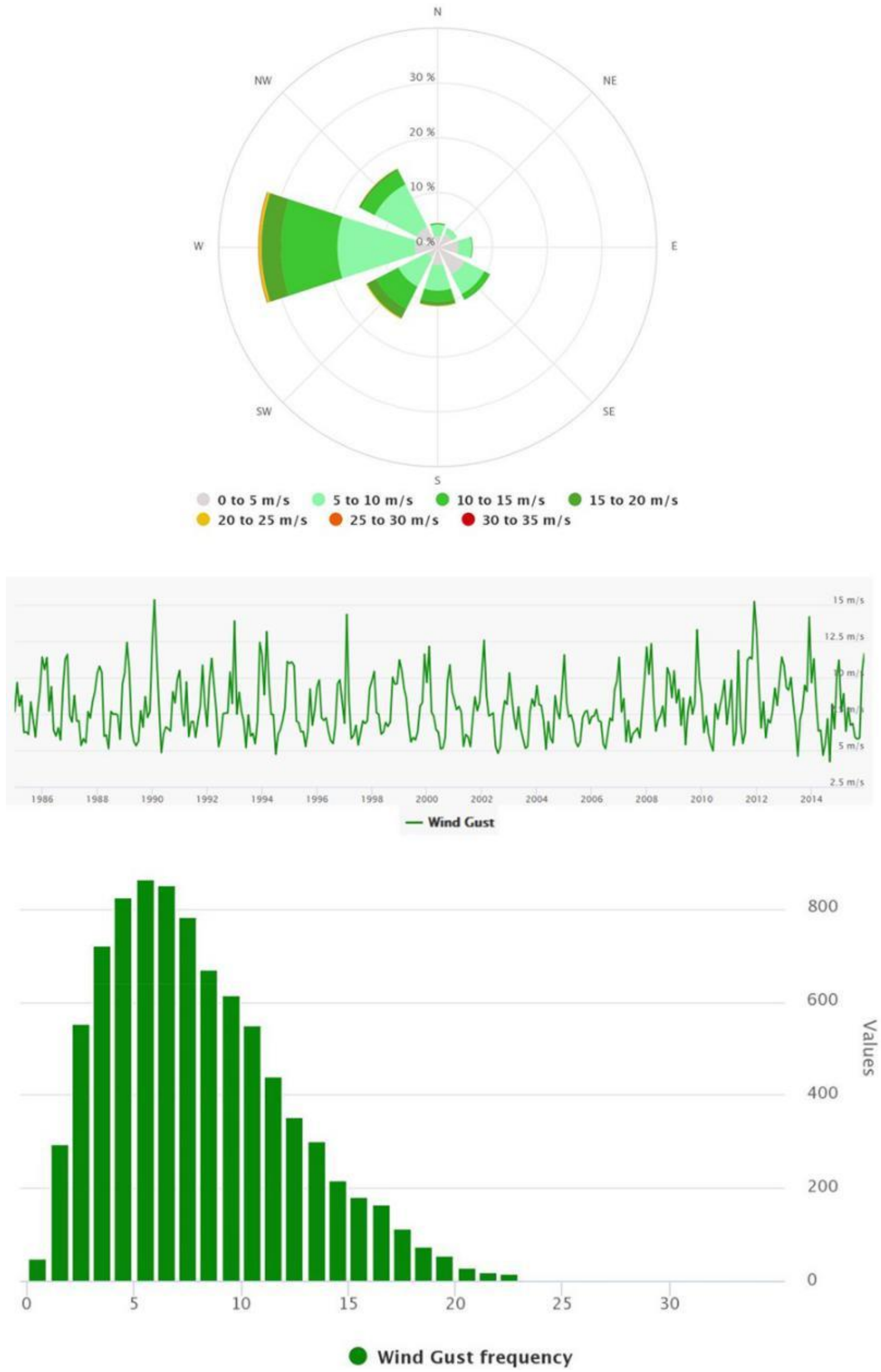


Figure 13.16 Maximum Wind Conditions

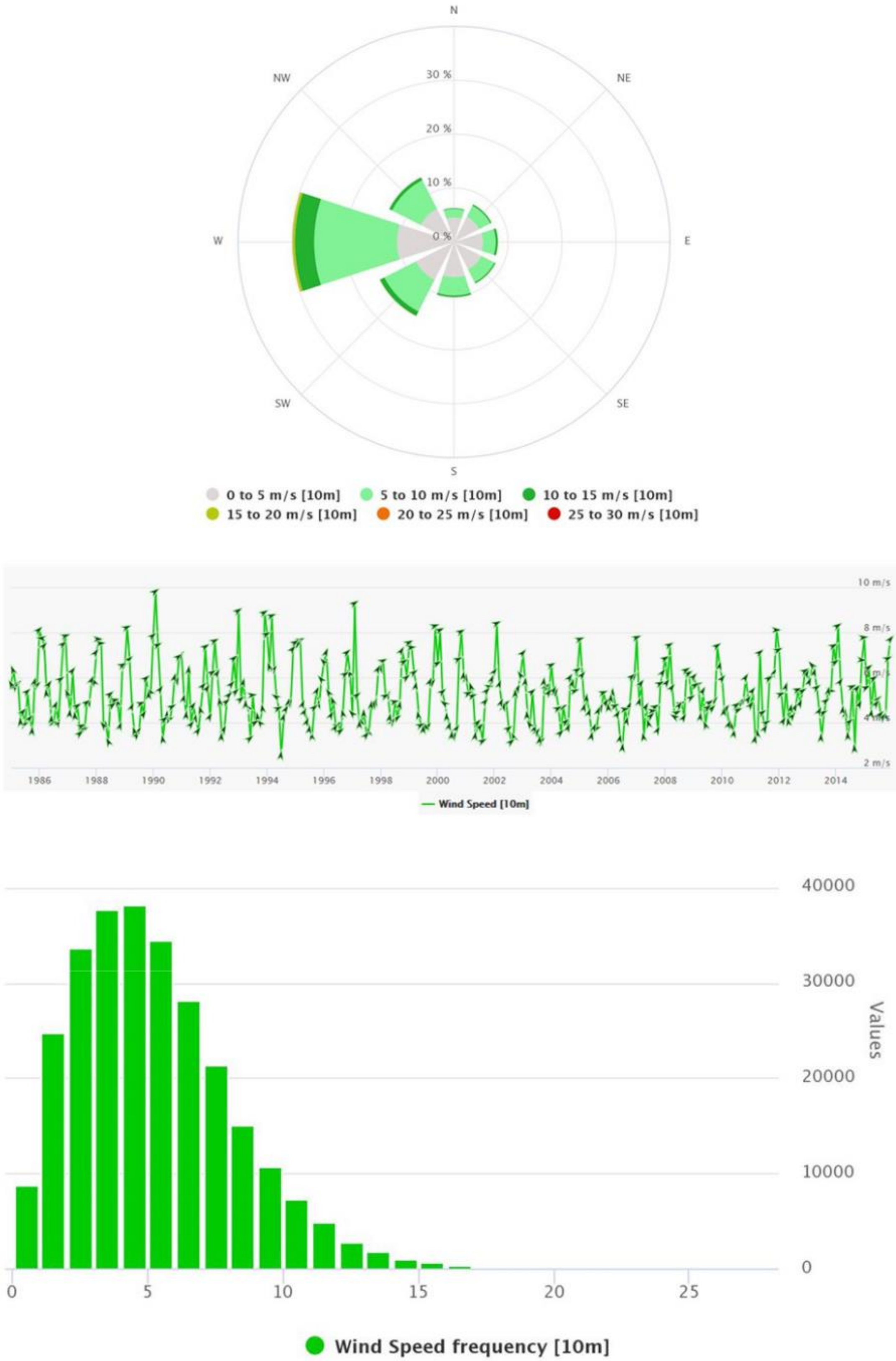


Figure 13.17 Mean Wind Conditions

Comparison with the on-site weather station

The wind profile built using the data from Dublin Airport, is also compared with the one obtained using the data collected on a nearby site in the period 2nd - 9th April 2020. Figure 13.18 shows B-Fluid weather station.

Figure 13.18 B-Fluid On-site Weather Station

Figures 13.19 and 13.20 respectively show the wind speed and direction and wind gust recorded by the on-site weather station. The green, blue and black data represent the wind speed/gust daily mean, max and min respectively.

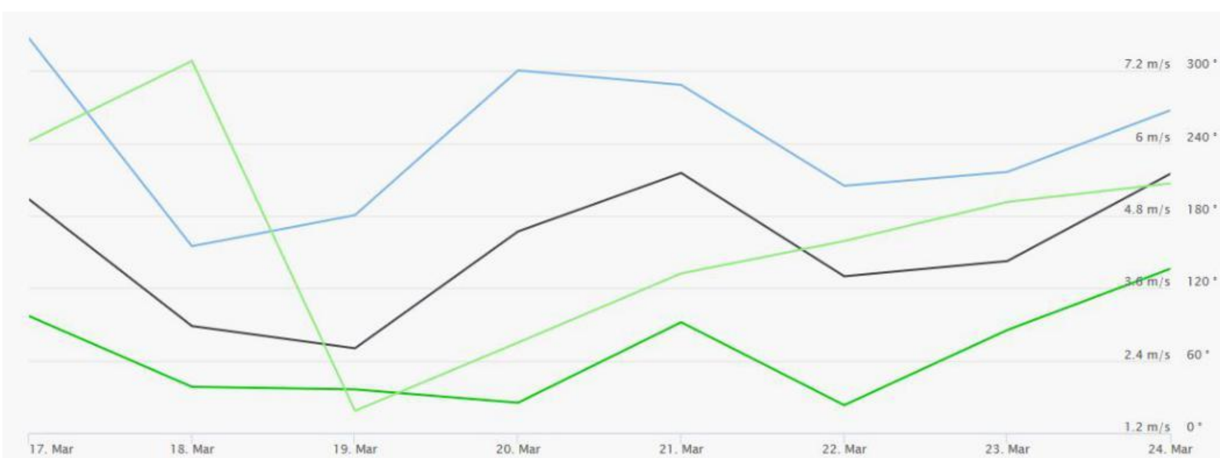


Figure 13.19 Wind speed and Direction recorded by B-Fluid nearby Weather Station

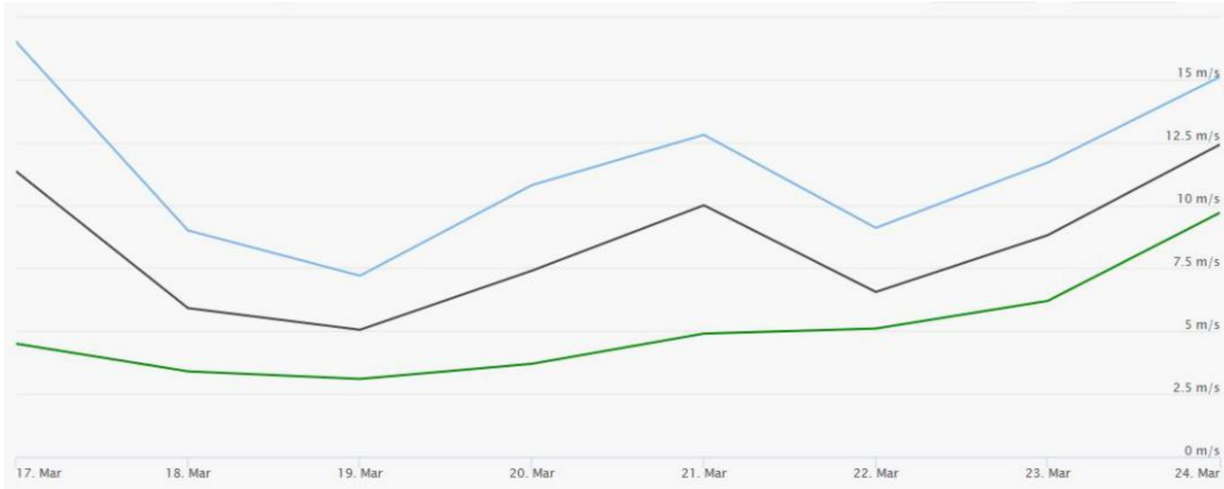


Figure 13.20 Wind gust recorded by B-Fluid nearby Weather Station

As it is possible to assess from the comparison between on-site and airport measurements, presented in Figure 13.21 and 13.22, it can be concluded that the wind speed daily mean and the wind gust daily mean recorded on site follow the same pattern as the one recorded at Dublin Airport. However, the trends of the wind speed levels and the gust wind speed levels registered on-site are slightly lower. This is due to the fact that the site is located close to the urban environment thus much more shielded if compared with Dublin Airport. This confirms that using wind data from Dublin Airport ensures a conservative analysis of the wind impact on the proposed Cookstown Castle Development.

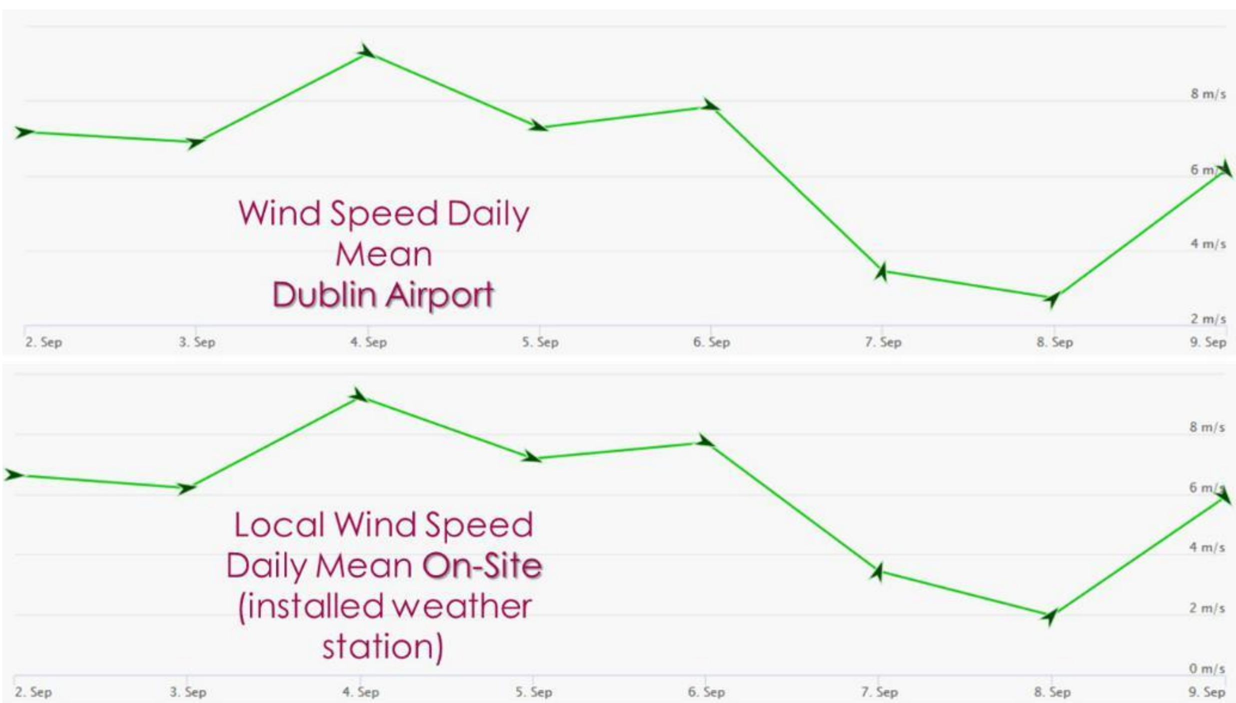


Figure 13.21 Wind Speed Daily Mean Comparison

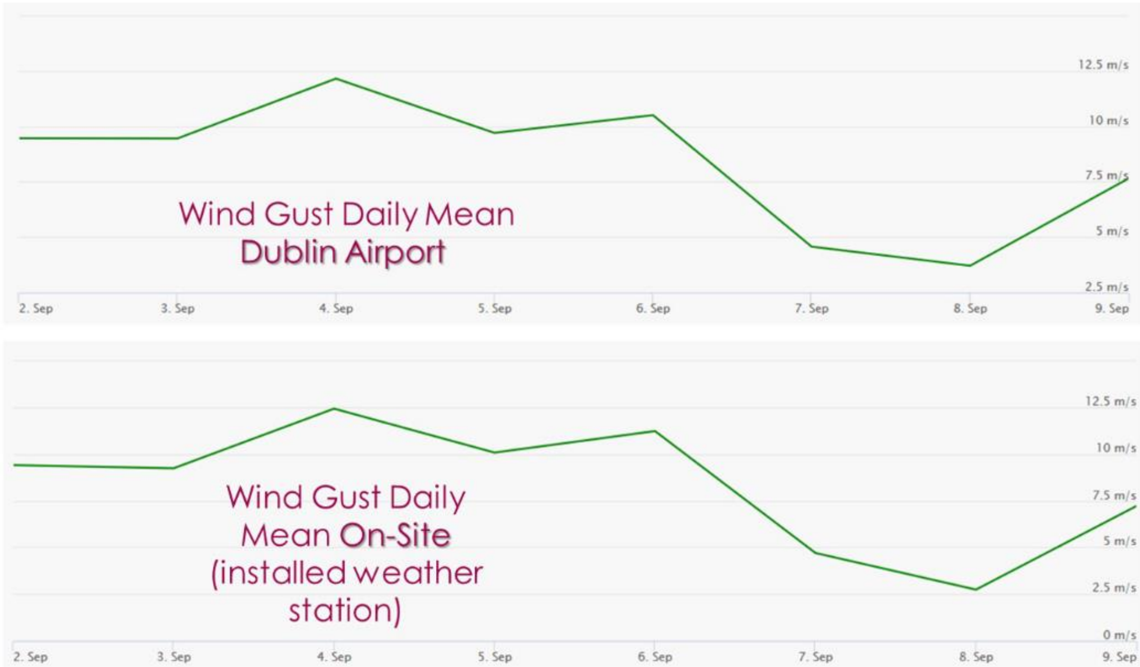


Figure 13.22 Wind Gust Daily Mean Comparison

Open Area Functions

The assessment of pedestrian wind comfort in urban areas focuses on activities people are likely to perform in the open space between buildings, which are in turn related to a specific function. For example the activity sitting a longer period of time is typically associated with the location of a street café or similar. Such combinations of activity and area can be grouped in four main categories:

A	Sitting for a long period of time; laying steady position; pedestrian sitting; *Terrace; street café or restaurant; open field theatre; pool*
B	Pedestrian standing; standing/sitting over a short period of time; short steady positions; *Public park; playing field; shopping street; mall*
C	Pedestrian walking; leisurely walking; normal walking; ramble; stroll *Walkway; building entrance; shopping street; mall*
D	Objective business walking; brisk or fast walking *Car park; avenue; sidewalk; belvedere*

Figure 13.23 Main Categories for Pedestrian Activities

Existing Receiving Environment Summary

The wind desktop study of the existing receiving environment showed that:

- The wind profile was built using the annual average of meteorology data collected at Dublin Airport Weather Station. In particular, the local wind climate was determined from historical meteorological data recorded 10 m above ground level at Dublin Airport.

- 18 different scenarios were selected in order to take into consideration all the different relevant wind directions. In particular, a total of 18 compass directions on the wind rose are selected. For each direction, the reference wind speed is set to the 5% exceedance wind speed for that direction, i.e. the wind speed that is exceeded for over 5% of the time whenever that wind direction occurs.

- The wind profile built using the data from Dublin Airport, is also compared with the one obtained using the data collected nearby the site. Except few differences, both the wind speed daily mean and the wind gust daily mean recorded on site follow the same patterns as the ones recorded at Dublin Airport. The speed levels registered on-site are in few cases slightly lower. This is due to the fact that the site is located close to the urban environment, thus much more shielded if compared with Dublin Airport. This confirms the fact that using wind data from Dublin Airport still ensures a conservative analysis of the wind impact on the development.

- The prevailing wind directions for the site are identified in the West, West South-West and South-East with magnitude of approximately 6m/s.

13.4 Characteristics of the Proposed Development

13.4.1 Description of Proposed Development

The development will consist of (i) Demolition of the existing industrial buildings (15,989sq.m); (ii) construction of a mixed-use development featuring: (a) 1104 no. 'build-to-rent' apartments in 4 no. blocks varying in height from four to eleven storeys; and (b) 4 no. commercial units, 1500sqm of office space and a crèche. The development is served by a total of 357 no. parking spaces and 1860 no. bicycle spaces; (iii) road, junction and streetscape upgrade works along First Avenue, Cookstown Road and Old Belgard Road, including the installation a signalized junction at the intersection of First Avenue and Cookstown Road and Old Belgard Road and Cookstown Road; (iv) construction of 3 no. new roads and 1 no. pedestrian/cycle link to the Belgard Luas Stop; (v) construction of a public plaza in the south-western corner of the site; and (vi) associated site and infrastructural works are also proposed which include: foul and surface water drainage; attenuation tanks; lighting; landscaping; boundary fences; plant areas; ESB substations; internal hard landscaping, including footpaths and street furniture; and all associated site development works. The image in Figure 13.24 shows the development plan view.

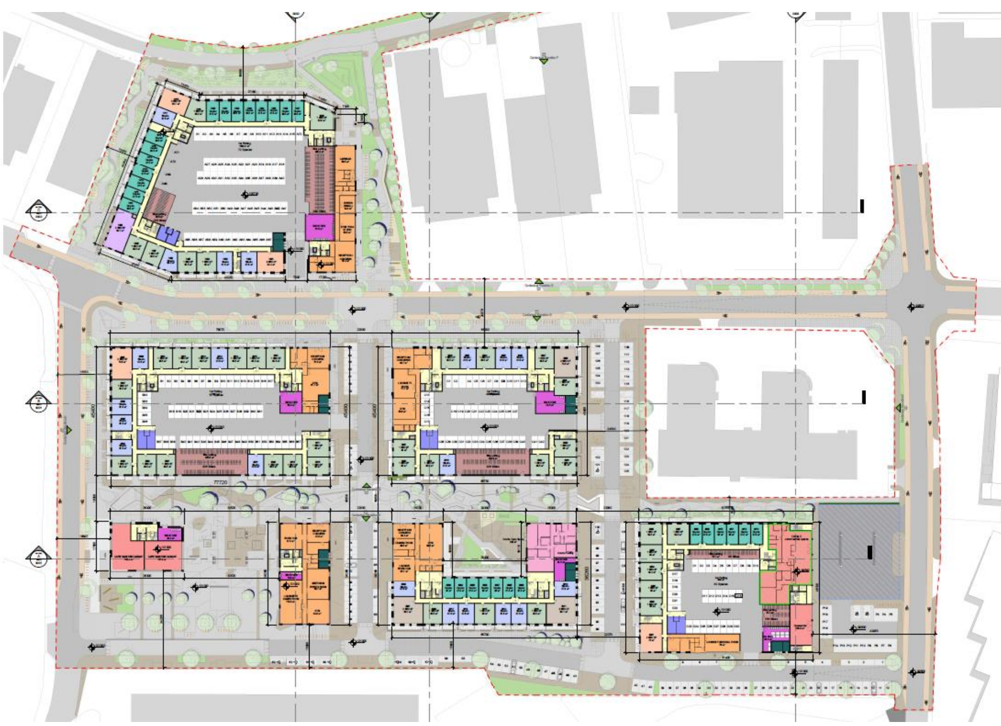


Figure 13.24 Cookstown Castle Plan View

13.5 Potential Impact of Proposed Development

Construction Phase

The effects on wind microclimate at the Site during the construction phase have been assessed using professional judgement. As construction of the Proposed Development progresses the wind conditions at the Site would gradually adjust to those of the completed development, and mitigation measures would need to be implemented before completion and operation.

Operational Phase

The construction of the development can potentially calm the existing wind condition in the area by providing further “urban context” to the existing topography, however, some areas can become more critical from a wind acceleration and re-circulation point of view and phenomena such as downwash, funnelling and downdraft can be experienced as well. The development, in principle, offer more drag to the incoming wind profile as detailed in the session that follow (see ”Planetary boundary layer and terrain roughness”). Consequently, the wind at lower level can reduce and modify its flow path directions. However, zones of re-circulations caused by the re-direction of the wind can also been expected, especially in the West South West direction where some funnelling can potentially occur. The potential impact of the development on the local wind microclimate have been quantify through the modelling of different wind scenarios and where areas of criticism have been detected, appropriate mitigation has been implemented and modelled to verify the reduction of the criticism and the suitability of the specific area to the designated pedestrian activity.

Cumulative Qualitative Assessment

It should be kept in mind that this preliminary analysis is only indicative and based on experience and fundamental fluid mechanical principles and does not reflect the real flow vector in magnitude and direction.

In general, this qualitative assessment is more conservative than the quantitative assessment resulting from the more detailed CFD analysis.

POTENTIAL DOWNDRAFT EFFECT

The downwash effect is localised in Figure 13.25 and the potential impact is discussed in the following text.

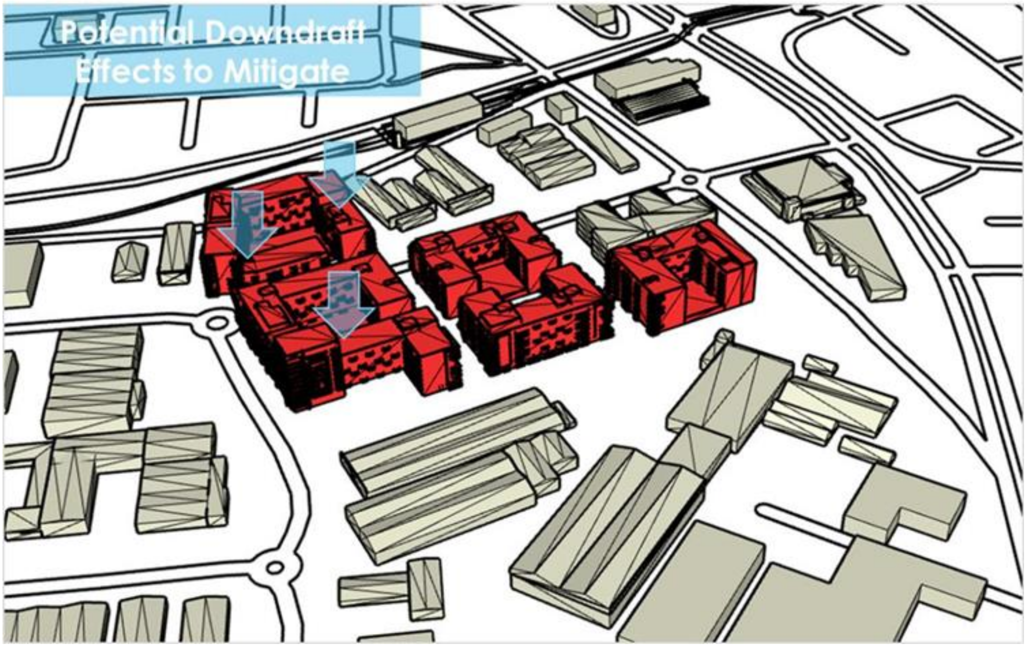


Figure 13.25 Downdraft Effects Localisation

The building heights varies across the site, this can create phenomena of downdraft in some areas. This can be seen when the leeward face of a low building faces the windward face of a tall building, it causes an increase in the downward flow of wind on the windward face of the tall building.

POTENTIAL FUNNELLING EFFECT

The funnelling effect is localised in Figure 13.26 and the potential impact is discussed in the following text.

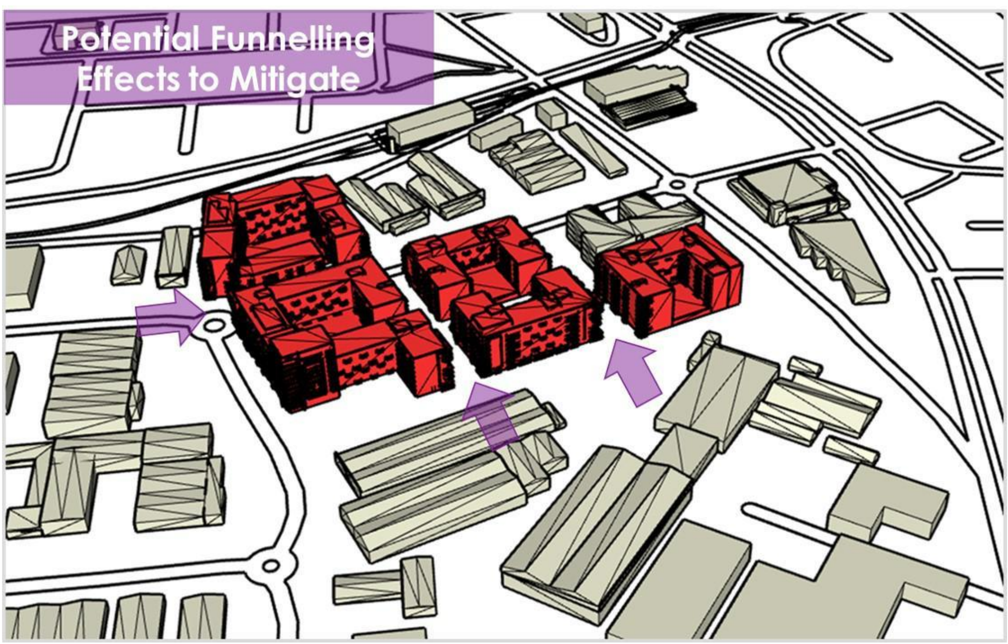


Figure 13.26 Funnelling Effects Localisation

Phenomena of funnelling/wind canyon between buildings cause acceleration of wind speeds. The intensity of this acceleration is influenced by the building heights, size of the facades, building separation distance and building orientation.

POTENTIAL DOWNWASH EFFECT

The downwash effect is localised in Figure 5.3 and the potential impact is discussed in the following text.

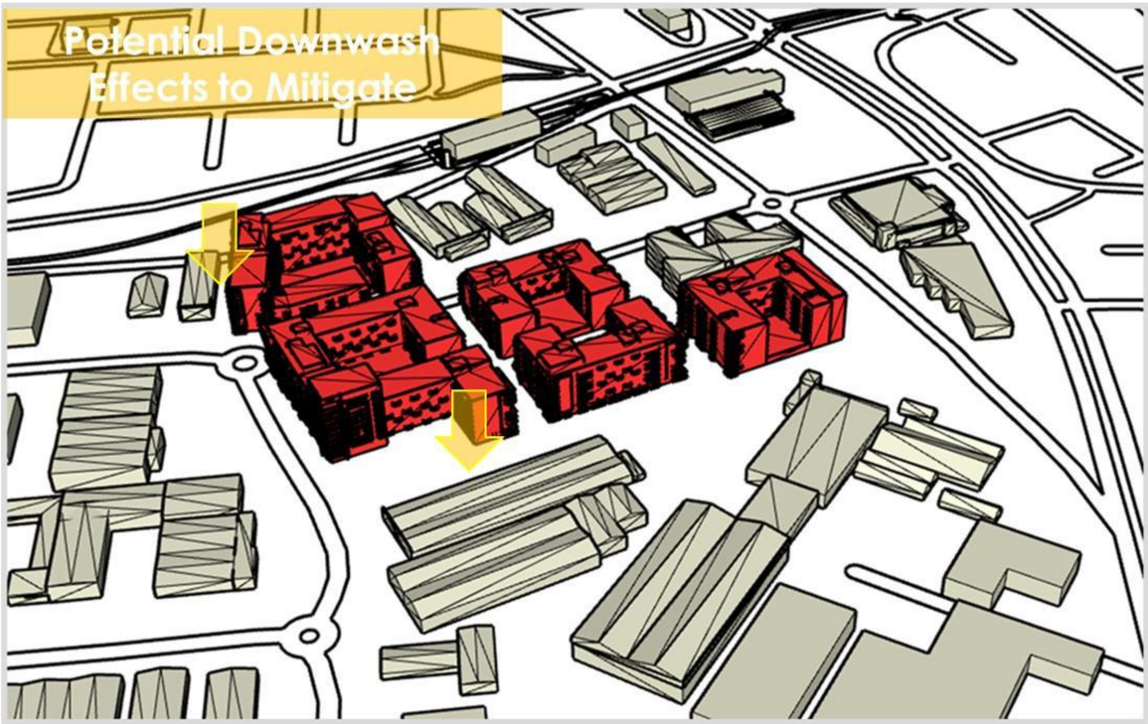


Figure 13.27 Downwash Effects Localisation

There is an intention of constructing tall buildings within the development. In this case, if the height ratio between the proposed tall buildings and their surrounding is increased significantly, a Downwash effect will be likely to occur. The tall buildings tend to deflect the wind downwards, causing accelerated wind speeds at pedestrian level and around the windward corners of the buildings.

Planetary Boundary Layer and Terrain roughness

Due to aerodynamic drag, there is a wind gradient in the wind flow just a few hundred meters above the Earth's surface – "the surface layer of the planetary boundary layer".

Wind speed increases with increasing height above the ground, starting from zero, due to the no-slip condition. In particular, the wind velocity profile is parabolic. Flow near the surface encounters obstacles that reduce the wind speed and introduce random vertical and horizontal velocity components. This turbulence causes vertical mixing between the air moving horizontally at one level, and the air at those levels immediately above and below it. For this reason, the velocity profile is given by a fluctuating velocity along a mean velocity value. Figure 13.28 shows the wind velocity profile, as described above.

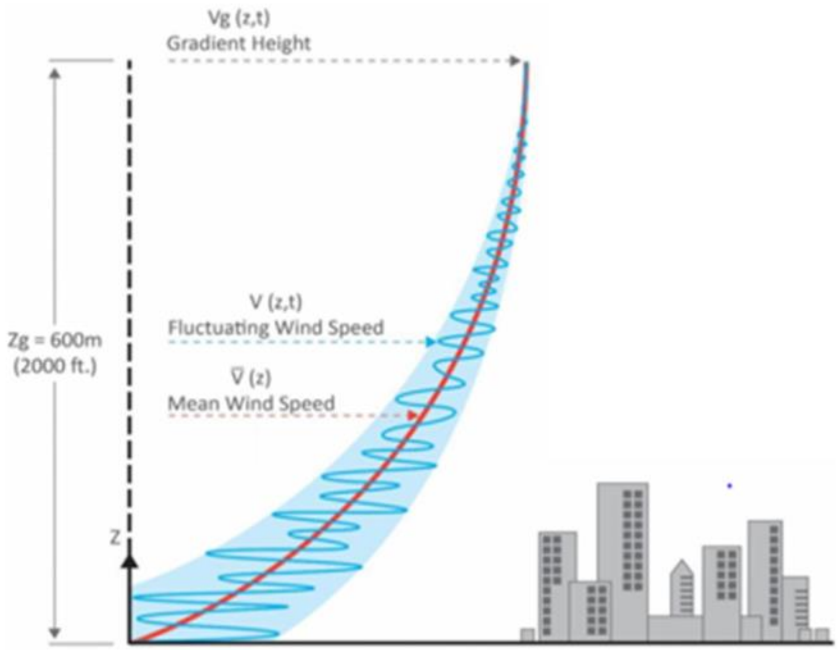


Figure 13.28 Wind Velocity Profile

Two effects influence the shape of the wind speed profile:

- Contours of the terrain: a rising terrain such as an escarpment will produce a fuller profile at the top of the slope compared with the profile of the wind approaching the slope.
- Aerodynamic 'roughness' of the upstream terrain: natural roughness in the form of woods or man-made roughness in the form of buildings. Obstructions near the ground create turbulence and friction, lowering the average wind speed. The higher the obstructions, the greater the turbulence and the lower the wind speed. As a general rule, wind speed increases with height.

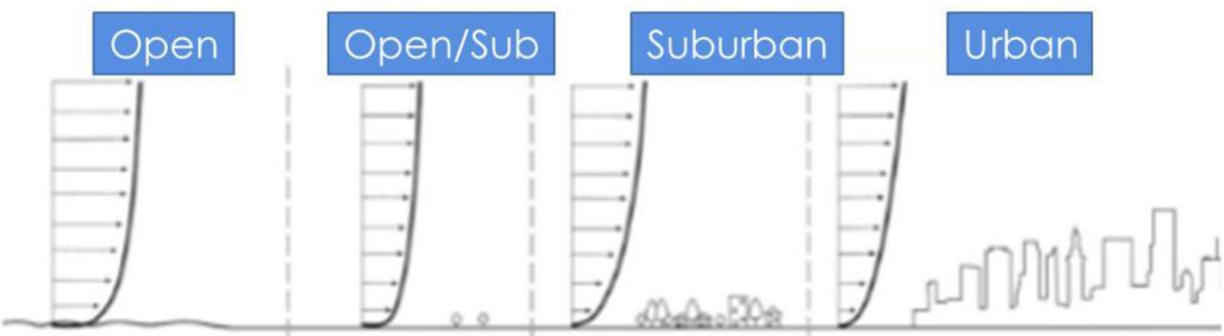


Figure 13.29 Wind Velocity Profile for different terrains

In order to assess the wind conditions in a particular area, it is important to know (Figure 5.6):

- Weather conditions in the area
- Location and orientation of the site
- Buildings distribution in the area
- Flow patterns at the building

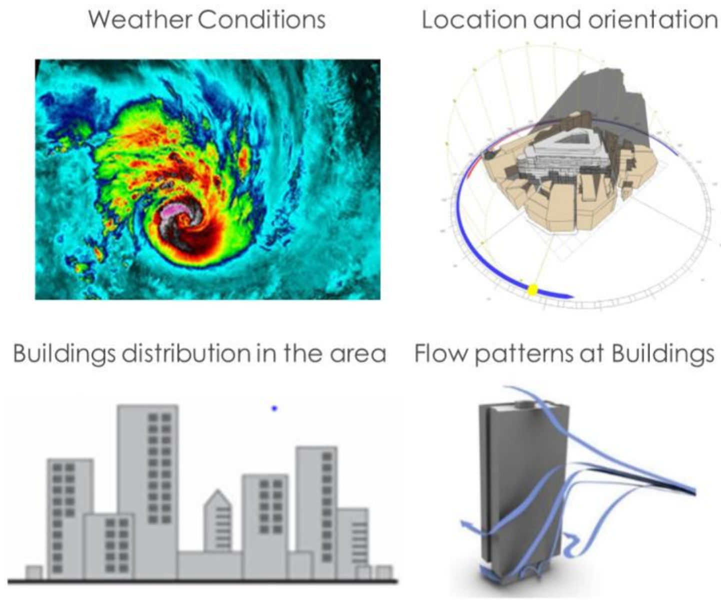


Figure 13.30 Parameters to know for Wind Conditions Assessment

Moreover, it is important to understand key flow features (Figure 5.7):

- Broad Building Face creates "DOWNWASH"
- Low Building Upwind Increases Wind Effects
- Gaps Between Buildings Increases Wind Velocity
- Low Building Upwind Increases Wind Effects

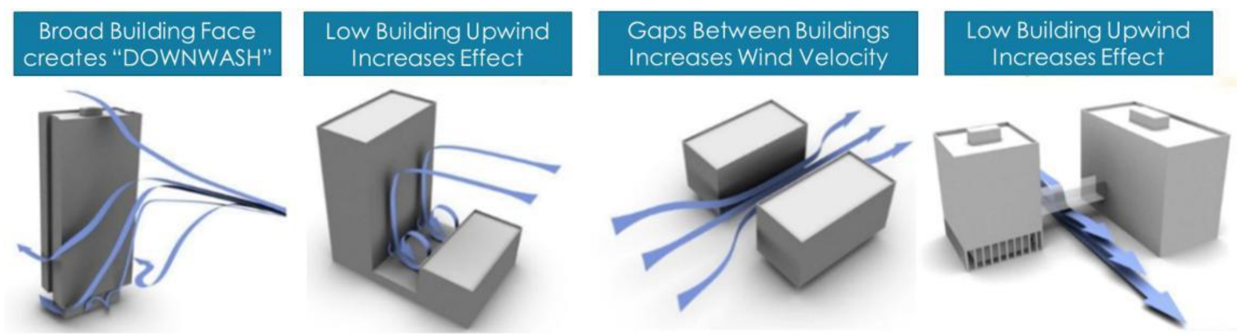


Figure 13.31 Parameters to know for Wind Conditions Assessment

13.6 Mitigation Measures

13.6.1 Construction Phase

The effects on wind microclimate at the Site during the construction phase have been assessed using professional judgement.

As construction of the Proposed Development progresses the wind conditions at the Site would gradually adjust to those of the completed development, and mitigation measures would need to be implemented before completion and operation.

13.6.2 Operational Phase

As stated above, if the wind conditions exceed the threshold, these conditions become unacceptable for favourable pedestrian activities and mitigation measure should be accounted for.

Mitigation measures include:

- **Landscaping**: the use vegetation to protect buildings from wind

- **Sculptural screening** (solid or porous): to either deflect the wind or bleed the wind by removing its energy.

- **Canopies and Wind gutters**: horizontal canopies are used to deflect the wind and redirect the wind around the building and above the canopy.

In particular, it is possible to summarise the different flow features and the corresponding mitigation option as follows (Figures 13.32 and 13.33):

- **Downwash Effects**: when wind hits the windward face of a tall building, the building tends to deflect the wind downwards, causing accelerated wind speeds at pedestrian level and around the windward corners of the building. This can occur when Tall and wide building facades face the prevailing winds.

- **Downdraft Effects**: When the leeward face of a low building faces the windward face of a tall building, it causes an increase in the downward flow of wind on the windward face of the tall building. This results in accelerated winds at pedestrian level in the space between the two buildings and around the windward corners of the tall building.

Example of Typical Mitigation Options:

- To mitigate unwanted wind effects it is recommended to introduce a base building or podium with a step back, and setting back a tower relative to the base building, the downward wind flow can be deflected, resulting in reduced wind speed at pedestrian level.
- Landscaping the base building roof and tower step back, wind speeds at grade can be further reduced, and wind conditions on the base building roof can improve.

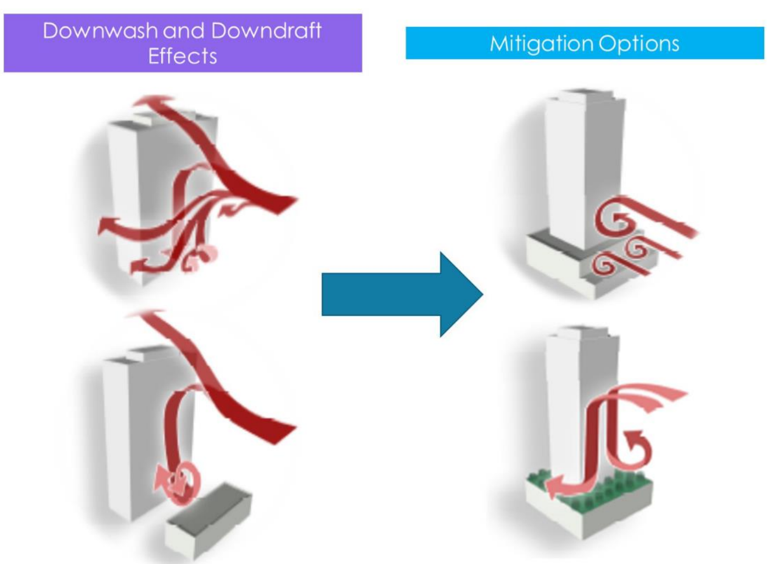


Figure 13.32 Mitigation Measures for Downwash and Downdraft Effects

- **Funneling Effects**: Wind speed is accelerated when wind is funneled between two buildings. This is referred to as the “wind canyon effect”. The intensity of the acceleration is influenced by the building heights, size of the facades, building separation distance and building orientation. Similar effect can be noticed when a bridge is connecting two buildings, the wind passing below the bridge is accelerated, therefore pedestrians can experience high uncomfortable velocities of wind.

Example of Typical Mitigation Options:

– A horizontal canopy on the windward face of a base building can improve pedestrian level wind conditions. Parapet walls around a canopy can make the canopy more effective.
– Sloped canopies only provide partial deflection of downward wind flow.
– A colonnade on the windward face of the base building provides the pedestrian with a calm area where to walk while being protected or a breeze walking space outside the colonnade zone.

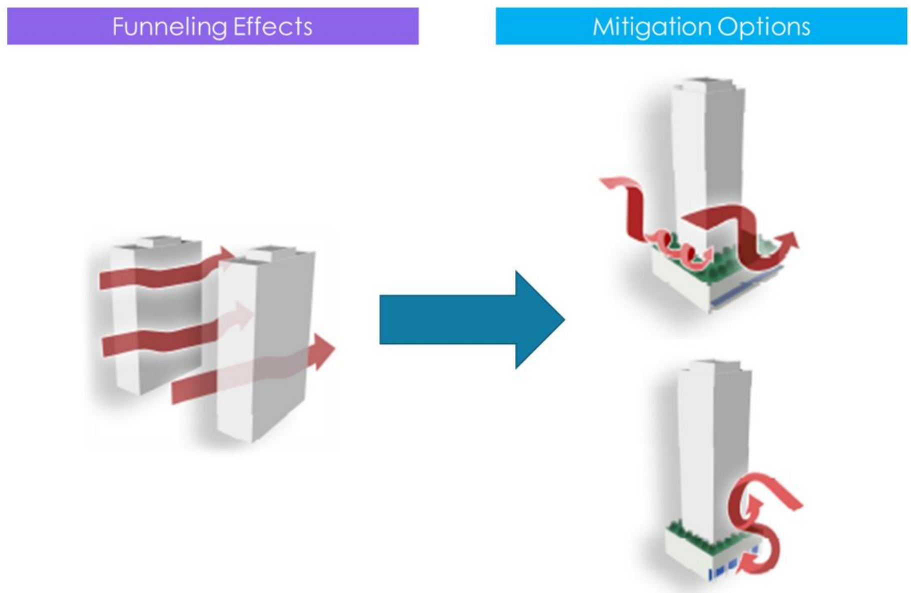


Figure 13.33 Mitigation Measures for Funnelling Effects

The mitigation measures utilized for this development is landscaping using tree plantings, which creates a reduced vorticity, making it possible to reduce incoming velocities, thus reducing wind impacts on the buildings, public spaces or pedestrian paths. Small particles randomly distributed within an area are normally used in numerical modelling to model trees, as shown in Figure 113.34. These introduce a pressure drop in the model and therefore causes the wind to reduce its speed when passing through the trees, as expected in reality. The CFD plot shown in Figure 13.34 demonstrate this effect.

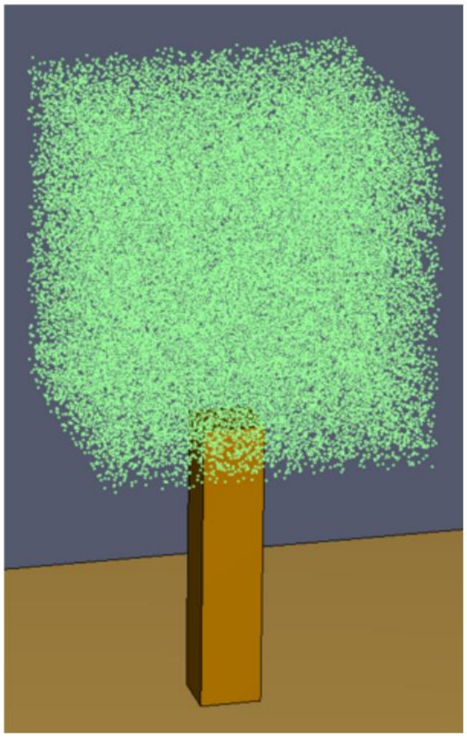


Figure 13.34 CFD Modelling of a tree

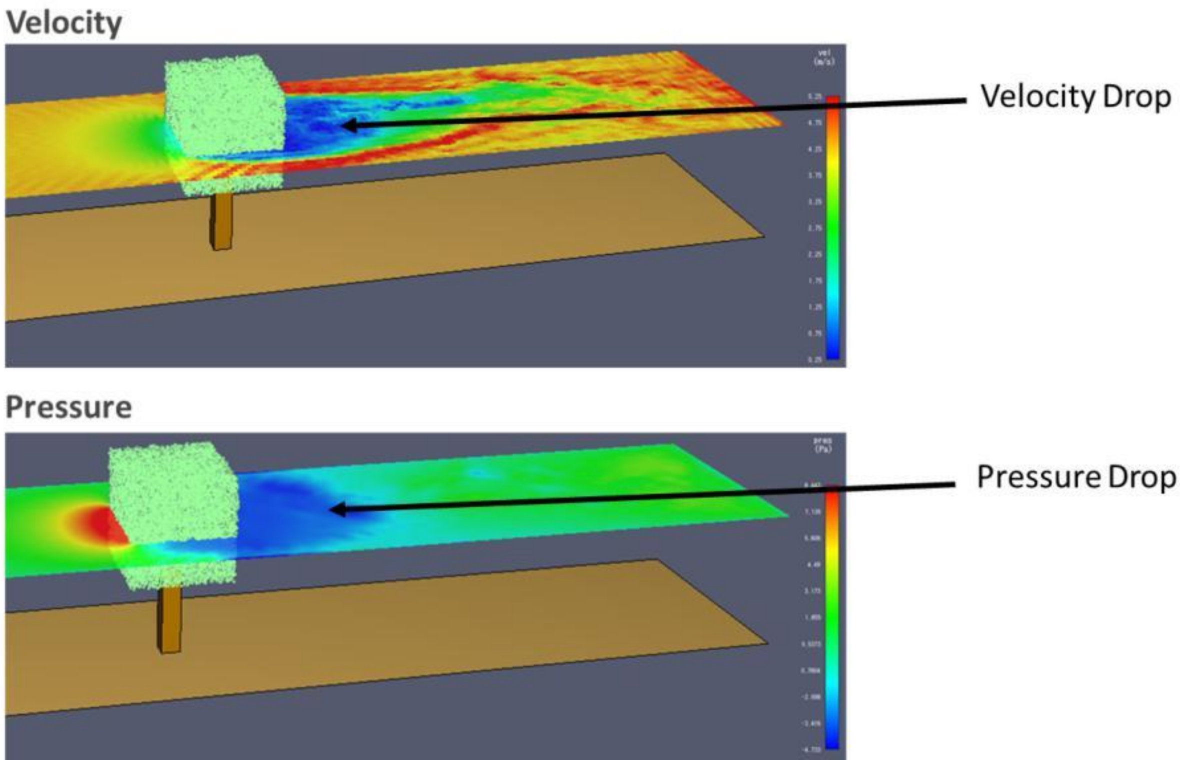


Figure 13.35 Generic Result of Wind Impacting on a Tree

13.7 Predicted Impact of the Proposed Development

This section assessed the potential impact of the proposed development on the already existing environment, and the suitability of the proposed development to create and maintain a suitable and comfortable environment for different pedestrian activities.

CFD Model Details of the Proposed Development

This subsection describes all features included in the geometrical and physical representation of Cookstown Castle Development CFD model. Any object which may have significant impact on wind movement and circulation are represented within the model. To be accurate, the structural layout of the building being modelled should include only the obstacles, blockages, openings and closures which can impact the wind around the building. It is important to remember that a CFD simulation approximates reality, so providing more details of the geometry within the model will not necessarily increase the understanding of the bulk flows in the real environment.

Modelled Geometry

Cookstown Castle Development Model is shown in Figures 13.36 and 13.37.

The modelled layout and dimensions of the surrounding environment are outlined in the table below (Table 13.2).

In order to represent reality and consider the actual wind impacting on the site, the modelled area for the wind modelling study comprises a wider urban area of 2km² around the Cookstown Castle Development, as shown.

	MODELLED CFD ENVIRONMENT DIMENSIONS		
	Width	Length	Height
CFD Mesh Domain	2000m approx	2000m approx	250m approx

Table 13.2 Modelled Environment Dimensions

Figure 13.36 Cookstown Castle Development - Extents of Modelled Area

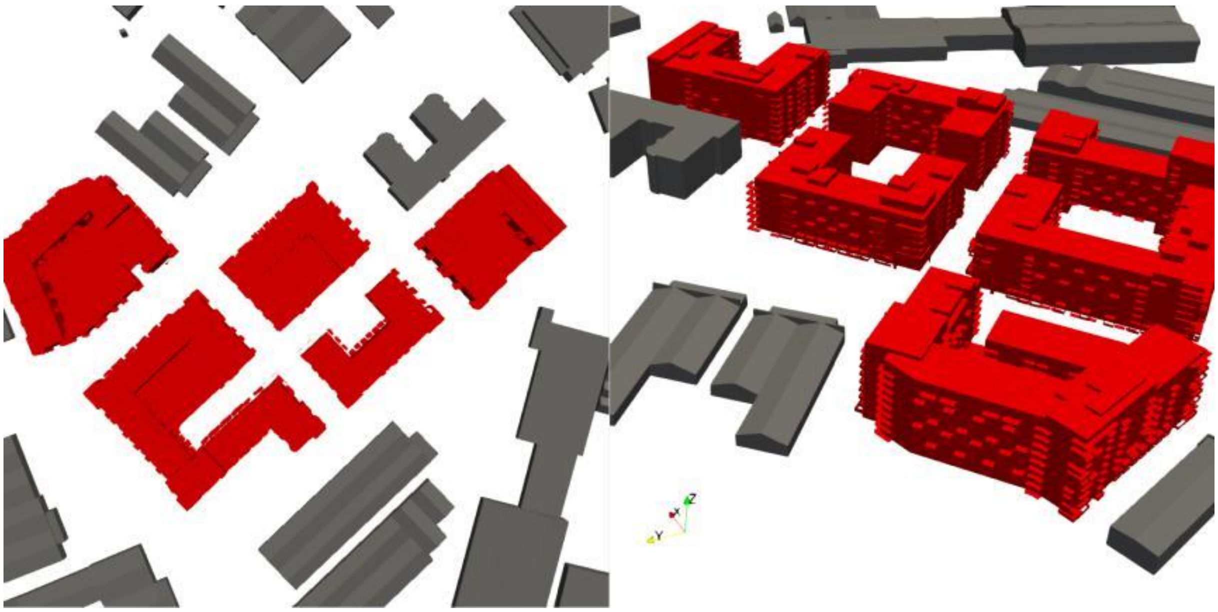


Figure 13.37 Cookstown Castle Development

Boundary Conditions

A rectangular computational domain was used for the analysis. The wind directions were altered without changing the computational mesh. For each simulation scenario, an initial wind velocity was set according to the statistical weather data collected in order to consider the worst case scenario. Building surfaces within the model are specified as 'no slip' boundary conditions. This condition ensures that flow moving parallel to a surface is brought to rest at the point where it meets the surface. Air flow inlet boundaries possess the 'Inlet' wind profile velocity patch boundary condition with its appropriate inflow turbulence intensity and dissipation rates. Air exits the domain at the 'pressure outlet' boundary condition.

The wind velocity data provided by the historical data collection and by the local data measuring are used in the formula below for the logarithmic wind profile to specify the wind velocity profile (wind velocity at different heights) to be applied within the CFD model:

$$v_2 = v_1 \cdot \frac{ln\frac{h_2}{z_0}}{ln\frac{h_1}{z_0}} \tag{7.1}$$

where:

- v_1 = wind speed measured at the reference height h_1
- h_1 = reference height to measure v_1
- h_2 = height of the wind speed v_2 calculated for the wind profile
- z_0 = 0.4 [m] roughness length selected (see table in Figure 7.3 below)

Roughness Classes and Lengths

Roughness class	Roughness length z_0	Land cover types
0	0.0002 m	Water surfaces: seas and Lakes
0.5	0.0024 m	Open terrain with smooth surface, e.g. concrete, airport runways, mown grass etc.
1	0.03 m	Open agricultural land without fences and hedges; maybe some far apart buildings and very gentle hills
1.5	0.055 m	Agricultural land with a few buildings and 8 m high hedges seperated by more than 1 km
2	0.1 m	Agricultural land with a few buildings and 8 m high hedges seperated by approx. 500 m
2.5	0.2 m	Agricultural land with many trees, bushes and plants, or 8 m high hedges seperated by approx. 250 m
3	0.4 m	Towns, villages, agricultural land with many or high hedges, forests and very rough and uneven terrain
3.5	0.6 m	Large towns with high buildings
4	1.6 m	Large cities with high buildings and skyscrapers

Figure 13.38 Roughness length and class to be used for the logarithmic wind profile

The wind profile used in the model has been calculated using the formula above and is represented in Figure 13.39.

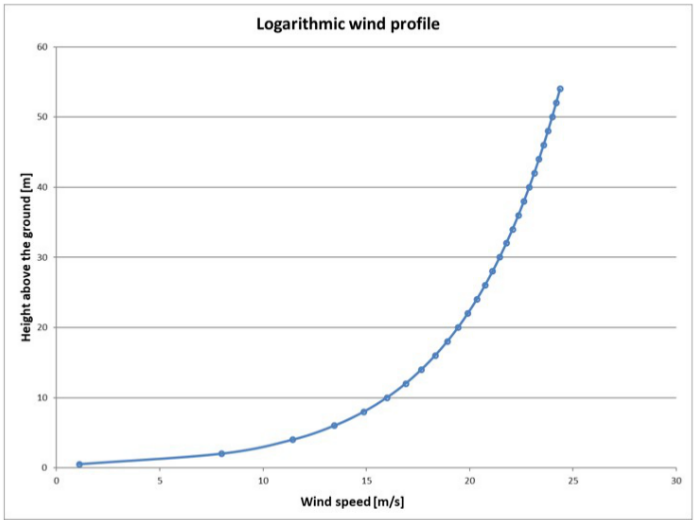


Figure 13.39 Wind profile used in the model

Computational Mesh

The level of accuracy of the CFD results are determined by the level of refinement of the computational mesh. A mesh independent analysis is carried out prior to detailed simulation for final results. Details of parameters utilized for air and the computational mesh are presented in Table 13.3, while an example of the utilized computational mesh grid is as shown in Figures 13.40 and 13.41.

The grid follows the principles of the 'Finite Volume Method', which implies that the solution of the model equations is calculated at discrete points (nodes) on a three-dimensional grid, which includes all the flow volume of interest. The mathematical solution for the flow is calculated at the centre of each of these cells and then an interpolation function is used by the software to provide the results in the entire domain.

AIR AND COMPUTATIONAL MESH PARAMETERS	
Air Density r	1:2kg=m³
Ambient Temperature (T)	288K(approx:15C)
Min mesh cell size	0.1 m At Development Building 0.5m In The Refined Volume Surroundings 1.5m At Other Environment Buildings 2m Elsewhere
Min cell size ratio	1:1:1 (dx:dy:dz)
Total mesh size	Approx. cells number = 50 million

Table 13.3 Air and Computational Mesh Parameters

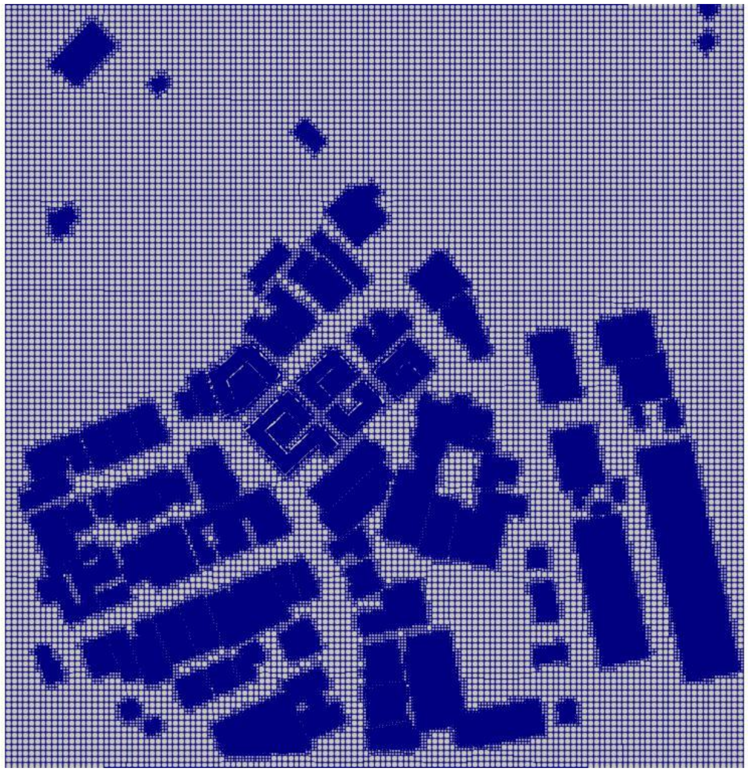


Figure 13.40 Cookstown Castle Domain - Computational Mesh Utilized

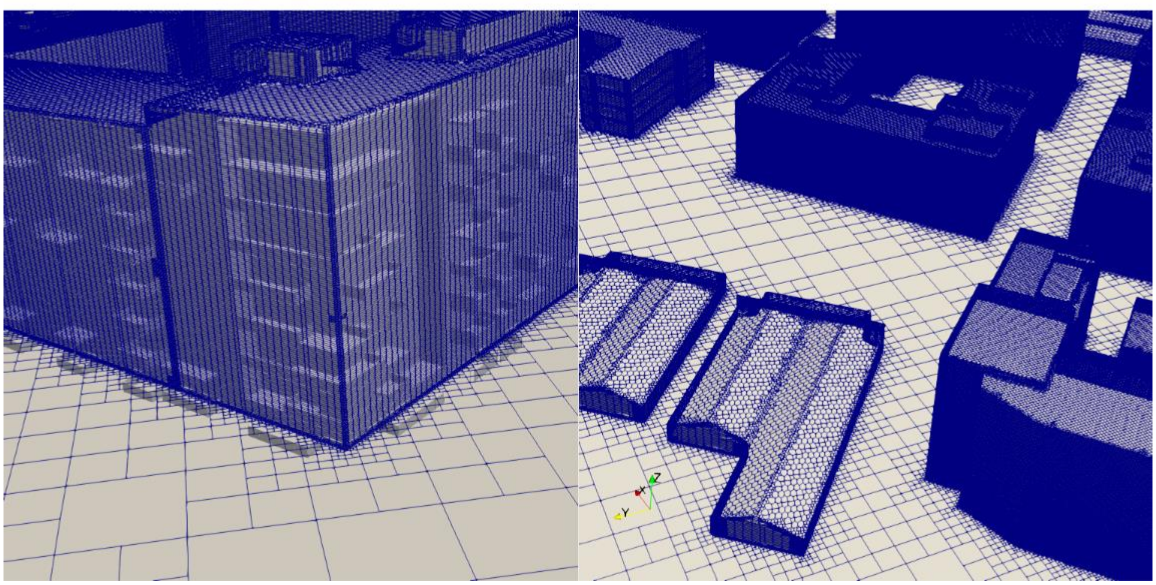


Figure 13.41 Cookstown Castle Development - Computational Mesh Utilized

13.7.1 Construction Phase

The possible effects on wind micro-climate at the site during the construction phase of Cookstown Castle Development has not been directly assessed but was evaluated based on professional judgement. Statistical Dublin historical wind data have been used to carry out this analysis based on the fact that the dominant wind direction is from South-West.

As the finalization of the development proceeds, the wind setting at the site would progressively conform to those of the completed development. It is possible that in the final stages of construction, implementation of the mitigation measures would be needed in areas that are expected to be windier than others should in case some areas of the site are expected to be functional before the construction is finalized.

Due to the fact that windier conditions are acceptable within a construction area (not accessible to the public), and the proposed development would not be the reason for critical wind conditions on-Site (and are slightly calmer when the development is in situ), the impacts evaluated on-Site are considered to be insignificant. Thus, the predicted impacts during construction phase are identified as not significant or negligible.

In summary, as construction of the Cookstown Castle Development progresses, the wind conditions at the site would gradually adjust to those of the completed development. During the construction phase, predicted impacts are classified as negligible.

13.7.2 Operational Phase

This section shows CFD results of wind and microclimate assessment carried out considering the ‘Operational Phase’ of Cookstown Castle Development. In this case the assessment has considered the impact of wind on the existing area including the proposed Cookstown Castle Development. For this scenario, Cookstown Castle Development has been simulated. Wind simulations have been carried out on all the various directions for which the development could show critical areas in terms of pedestrian comfort and safety. For this, the Lawson and Distress Maps have been presented to identify the suitability of each areas to its prescribed level of usage and activity. The results present parameters outlined within the acceptance criteria previously described.

A summary of CFD model input data used in this project is given in the table shown in Figure 13.42.

Parameter	COOKSTOWN PHASE 3 MODEL
Environment Conditions	
Ambient pressure	101325 Pa
Wind profile	Logarithmic atmospheric profile
Ambient temperature	15 ºC
Analysis type	Steady state (LES)
Computational Details	
Total cells used	> 20,000,000
Mesh size	< 0.2 m
Turbulence treatment	K-epsilon turbulence model
Convergence Criteria	$< 10^{-6}$
Boundary Conditions	
CFD Domain Inlet	Statistical Wind Profile
CFD Domain Outlet	Pressure Outlet condition (zero pressure gradient)
Cookstown Phase 3 Buildings	Zero velocity gradient (No-slip condition)

Figure 13.42 Summary of CFD Model Input Data

It is also of interest at this point to underline once more the objectives of simulations performed. In particular:

- Pedestrian Wind Comfort and Safety Studies are conducted to predict, assess and, where necessary, mitigate the impact of the development on pedestrian level wind conditions.

- To assess comfortable and safe pedestrian level wind conditions that are appropriate for the intended use of pedestrian areas. Pedestrian areas include sidewalks and street frontages, pathways, building entrance areas, open spaces, public spaces, amenity areas, outdoor sitting areas, etc.

Results of simulations carried out are detailed in the following sections. These results present parameters as outlined in the acceptance criteria section described previously for Cookstown Castle development. Results of wind flow speeds are collected throughout the simulation and analysed based on the Lawson Discomfort Criteria.

Figure 13.43 shows a 3D example of wind speed results collected at 1.5m height above ground floor level of the development. Red colors generally indicate critical values while blue colors indicate tenable conditions.

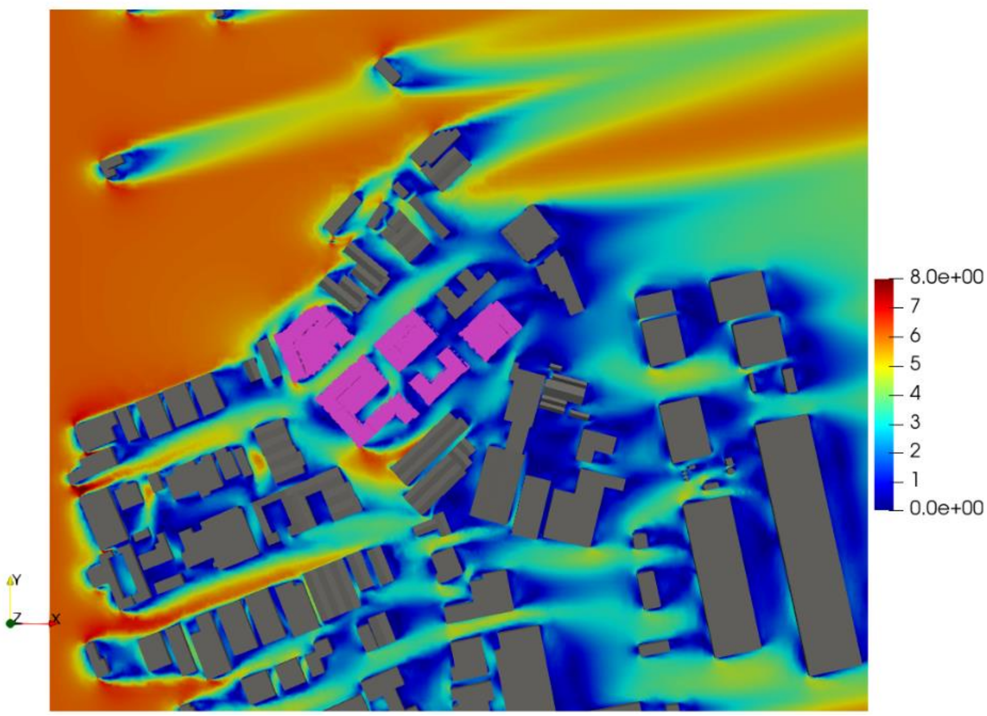


Figure 13.43 Wind Flow Results Collected At 1.5m Height Above Ground Floor

Flow Velocity Results - Ground Floor Level - Without Mitigation Measures

Results of wind speeds and their circulations around the proposed development at pedestrian level of 1.5m above the development ground are presented for all the simulated wind directions in Figures 13.44 to 13.53, in order to assess wind flows at ground floor level of Cookstown Castle Development.

Higher velocities are experienced around the buildings for certain wind directions. In particular, some recirculation effects are expected near the corners of the units. However, the implementation of tree landscaping on the main roads and all around the development, with particular attention to the corners of the buildings, will mitigate these effects.

Depending on the wind direction, funnelling effects are experienced on the main roads around the development and on the roads in-between the different blocks. Possible solutions for this could be horizontal canopies, which improve pedestrian level wind conditions. Parapet walls around a canopy can make the canopy more effective. Sloped canopies only provide partial deflection of downward wind flow. Finally, a colonnade on the windward face of the base building could provide the pedestrian with a calm area where to walk while being protected or a breeze walking space outside the colonnade zone. However, these conditions are not occurring at a frequency that would compromise the pedestrian comfort, according to the Lawson Criteria, as shown in the next Sections. Moreover, the implementation of tree landscaping in these areas will mitigate these effects.

Courtyards seem to be well shielded. However, some recirculation effect have been found for certain wind directions. The implementation of tree landscaping in these areas will mitigate these effects.

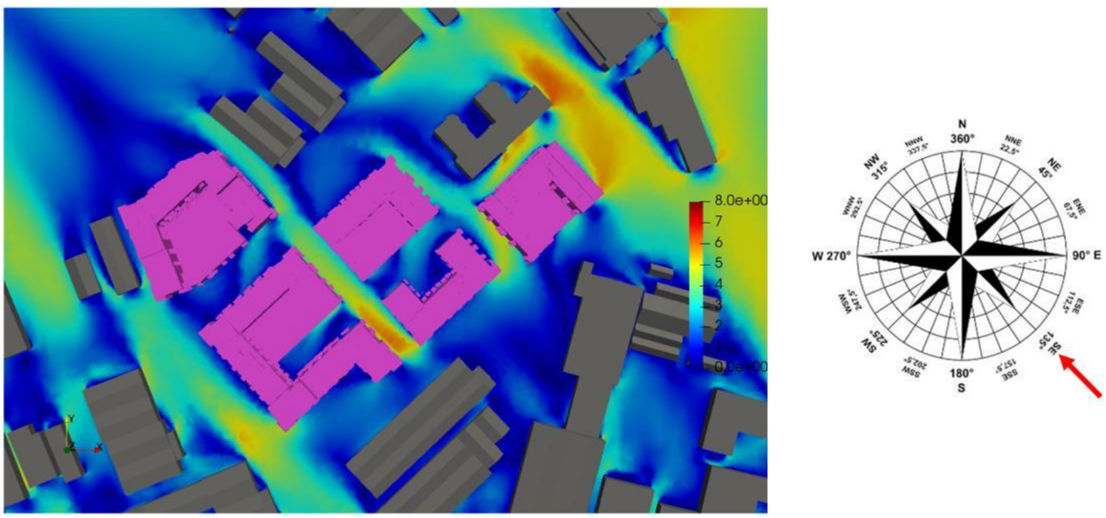


Figure 13.44 Wind Speed Results at 1.5m Above Ground - Top View: 135°

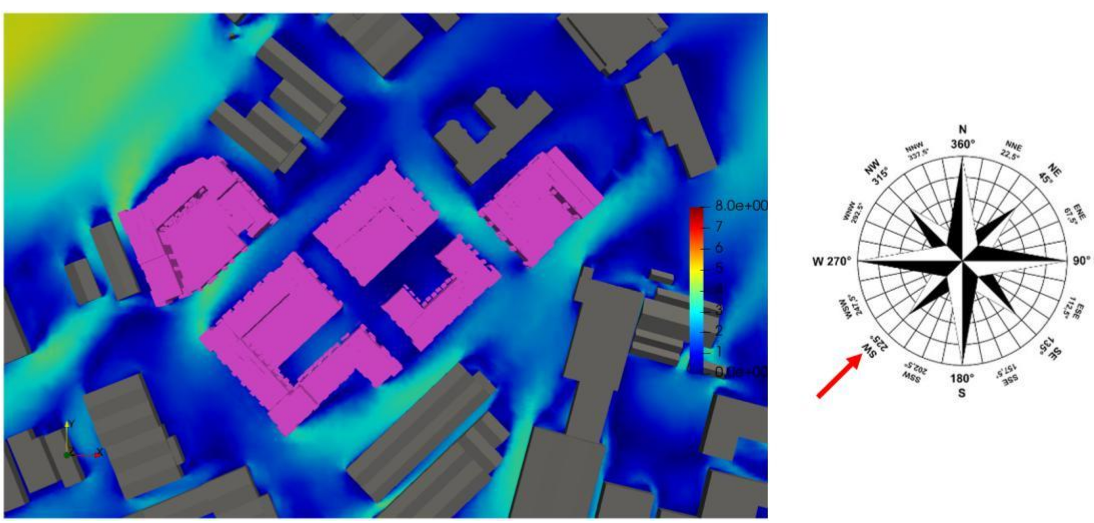


Figure 13.45 Wind Speed Results at 1.5m Above Development Ground - Top View: 225°

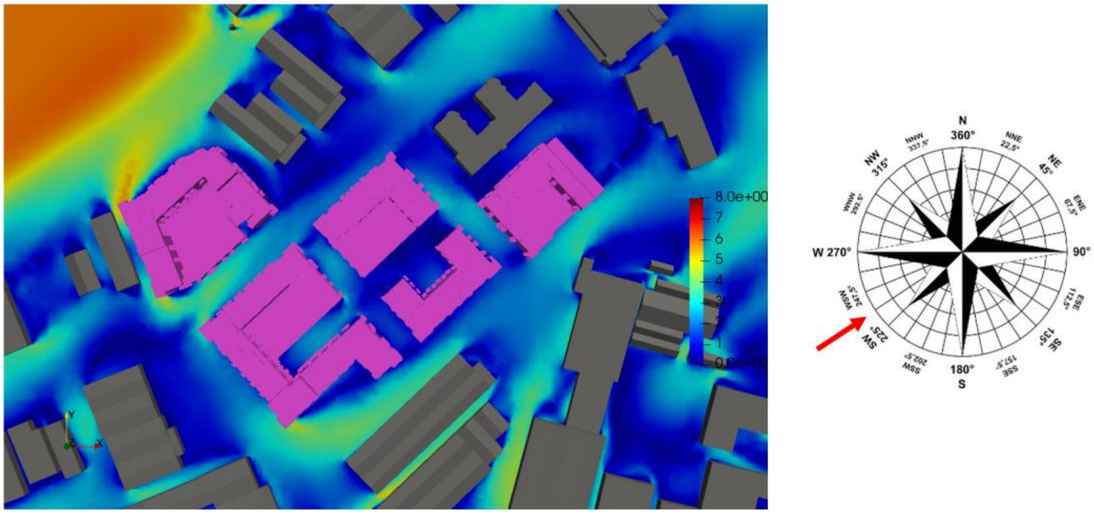


Figure 13.46 Wind Speed Results at 1.5m Above Development Ground - Top View: 236°

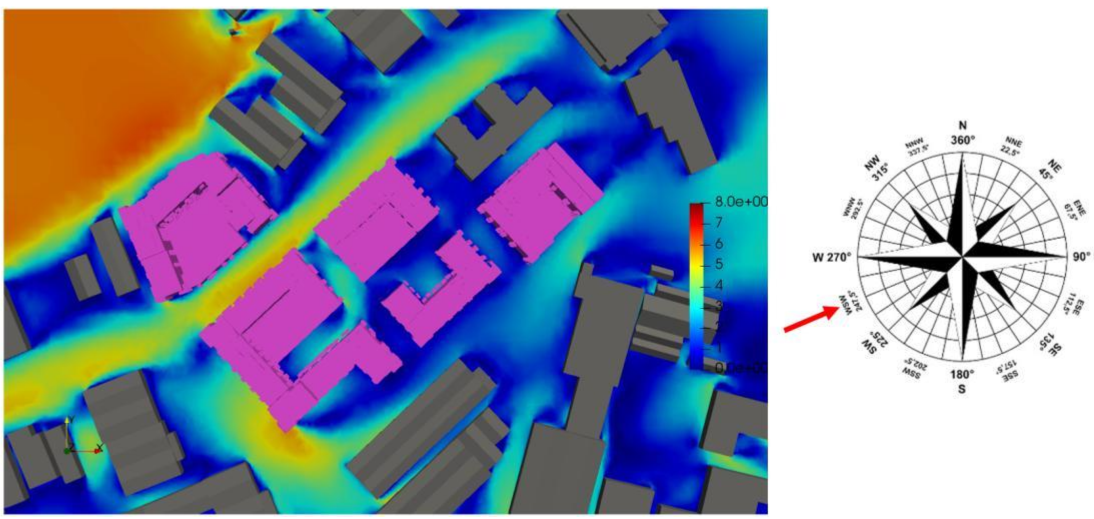


Figure 13.47 Wind Speed Results at 1.5m Above Development Ground - Top View: 247°

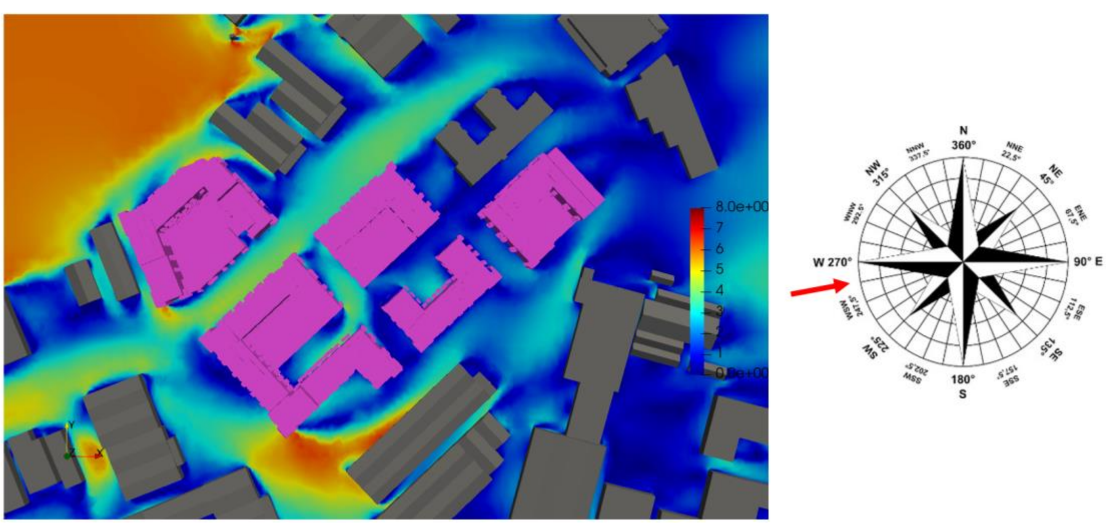


Figure 13.48 Wind Speed Results at 1.5m Above Development Ground - Top View: 258°

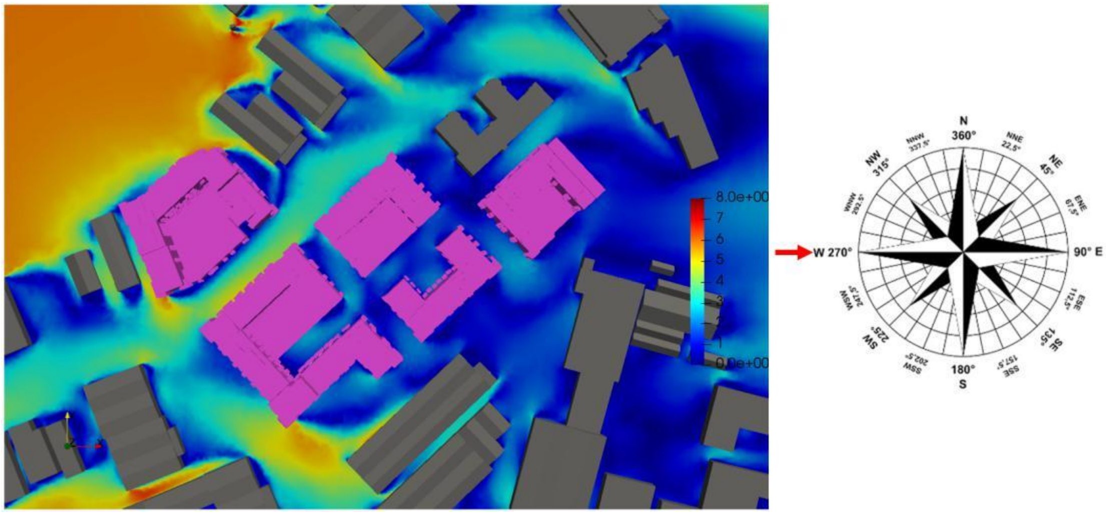


Figure 13.49 Wind Speed Results at 1.5m Above Development Ground - Top View: 270°

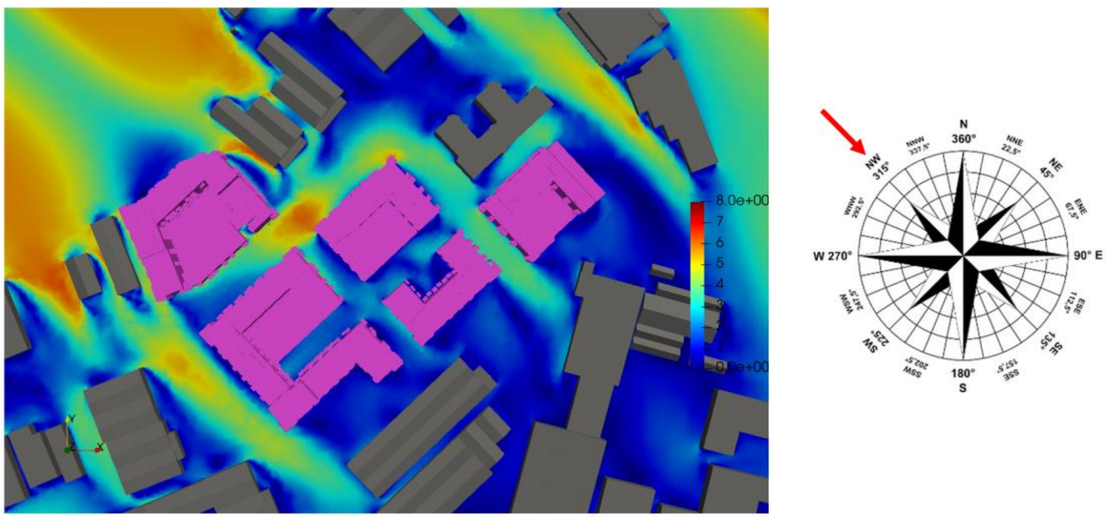


Figure 13.50 Wind Speed Results at 1.5m Above Development Ground - Top View: 315°

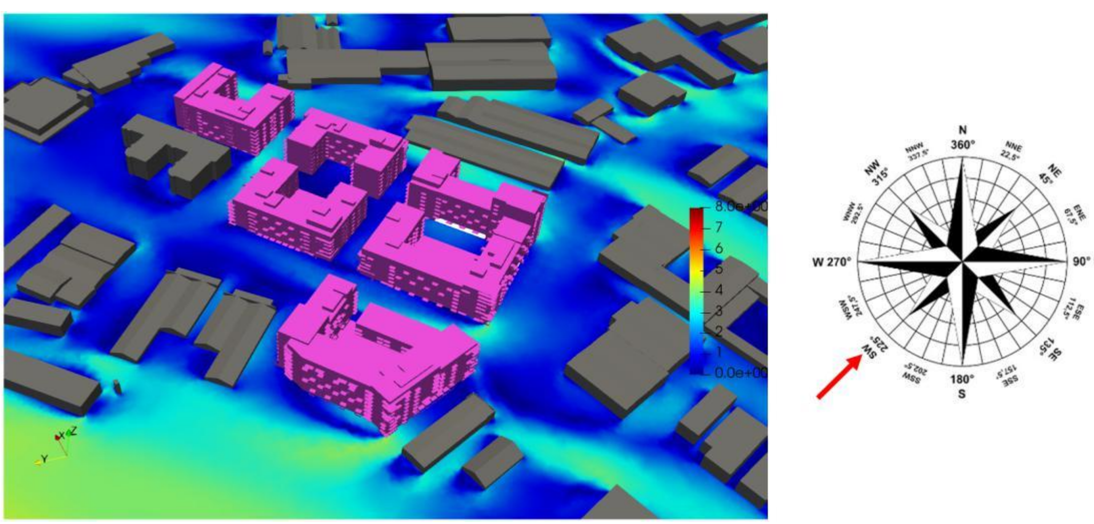


Figure 13.51 Wind Speed Results at 1.5m Above Ground - 3D View: 225°

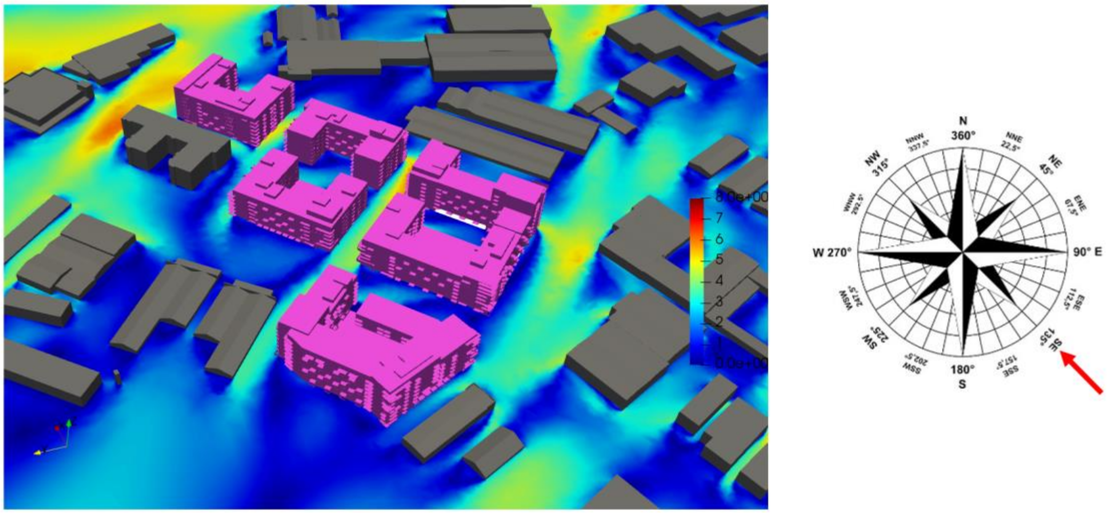


Figure 13.52 Wind Speed Results at 1.5m Above Development Ground - 3D View: 135°

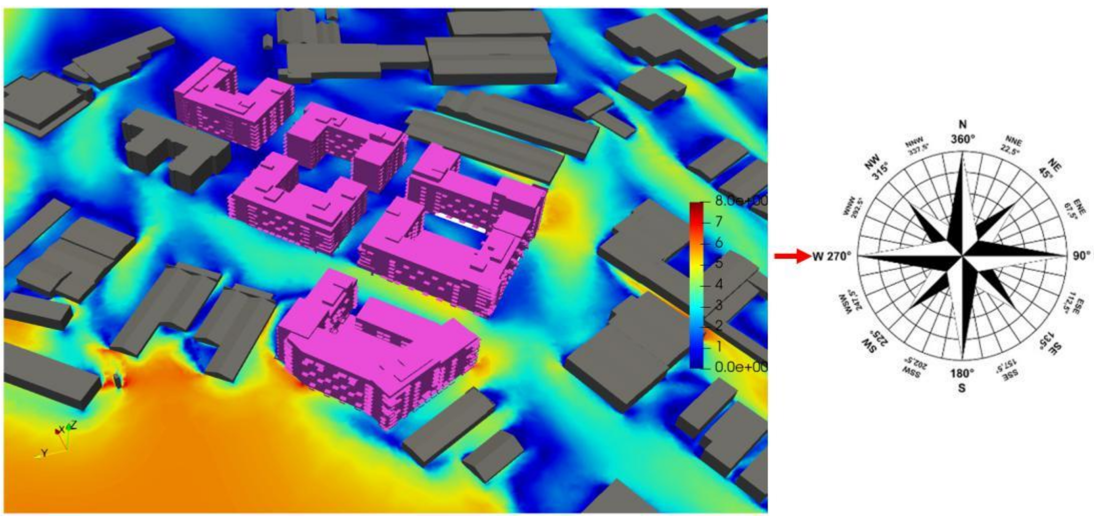


Figure 13.53 Wind Speed Results at 1.5m Above Development Ground - 3D View: 270°
]
Flow Velocity Results - Terraces

Figure 13.54 shows the terraces position over the blocks. In order to present the following results, each terrace has been identified with a different number.

Higher velocities can be found for some directions, only in some areas of the terraces and often corresponding to the edges of them. However, these velocities are below the threshold values defined by the acceptance criteria. Also, mitigation measures with trellis, pergola structures and multi stem planting will mitigate these velocities. Thus, it can be concluded that on the roof terrace good shielding is achieved everywhere.

Figures 13.55 to 13.70 show flow velocity results at 1.8m above the four proposed terraces of the development.

Figure 13.54 Terraces identified with number from 1 to 4

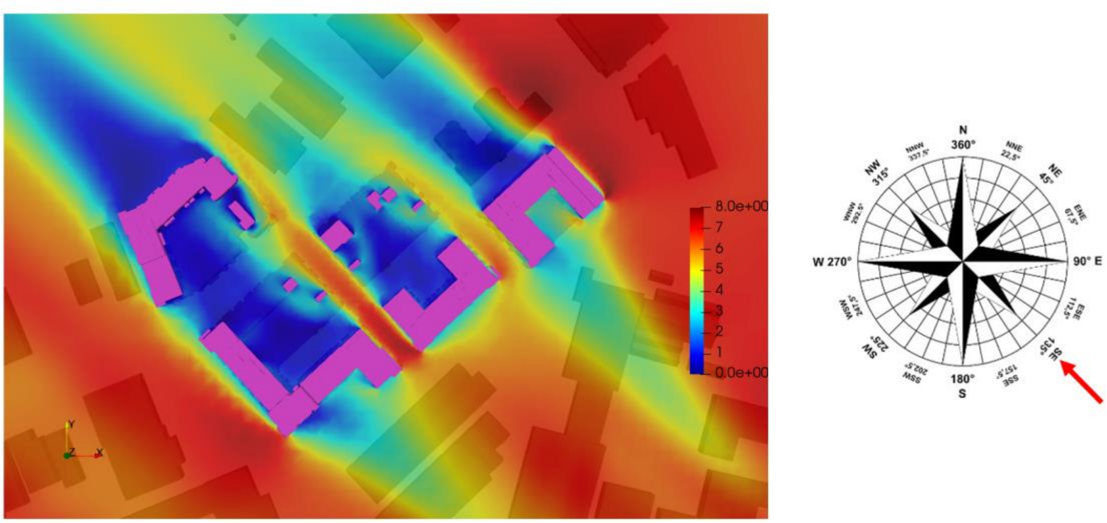


Figure 13.55 Wind Speed Results at 1.5m Above Terraces 1 and 2 - Top View: 135°

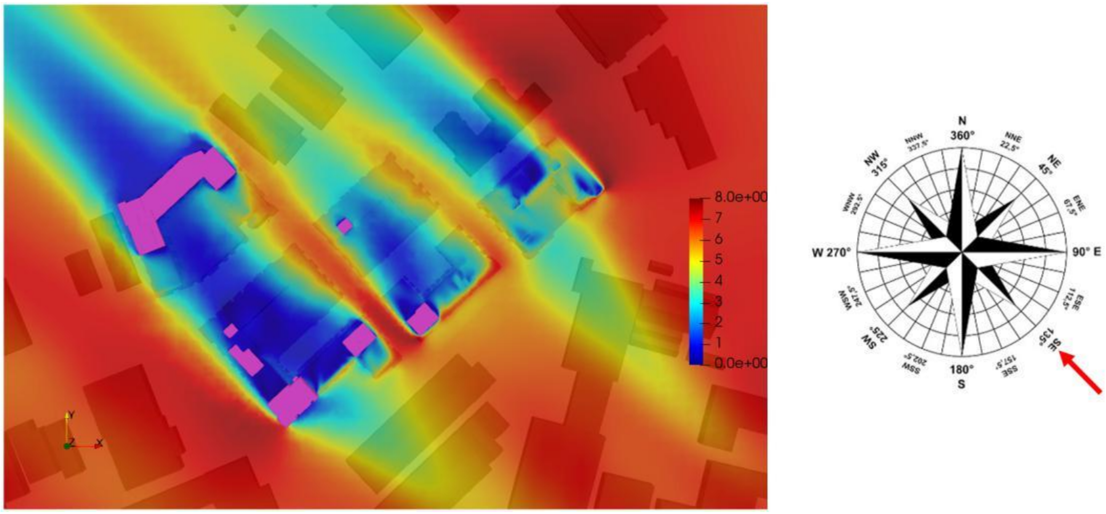


Figure 13.56 Wind Speed Results at 1.5m Above Terraces 3 and 4 - Top View: 135°

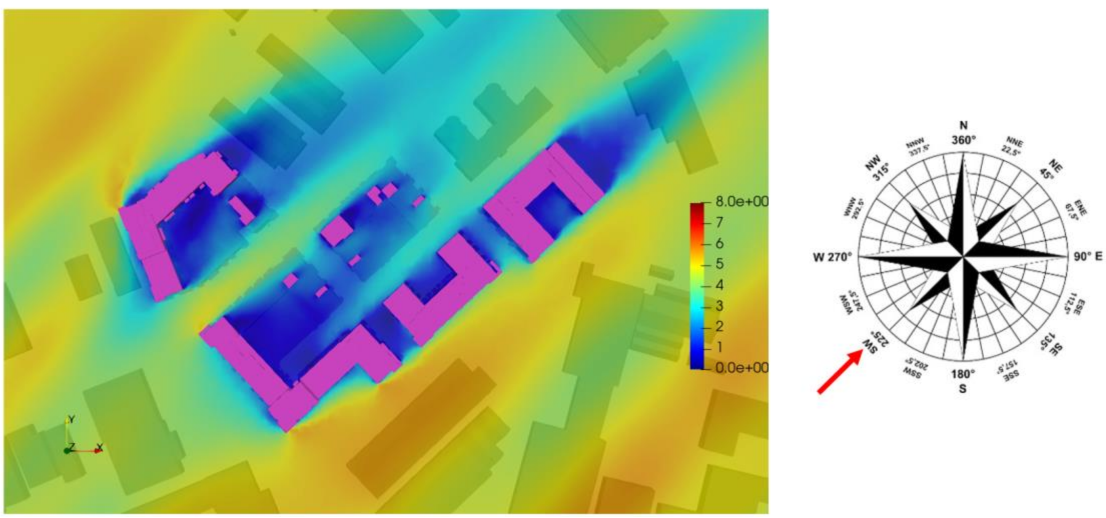


Figure 13.57 Wind Speed Results at 1.5m Above Terraces 1 and 2 - Top View: 225°

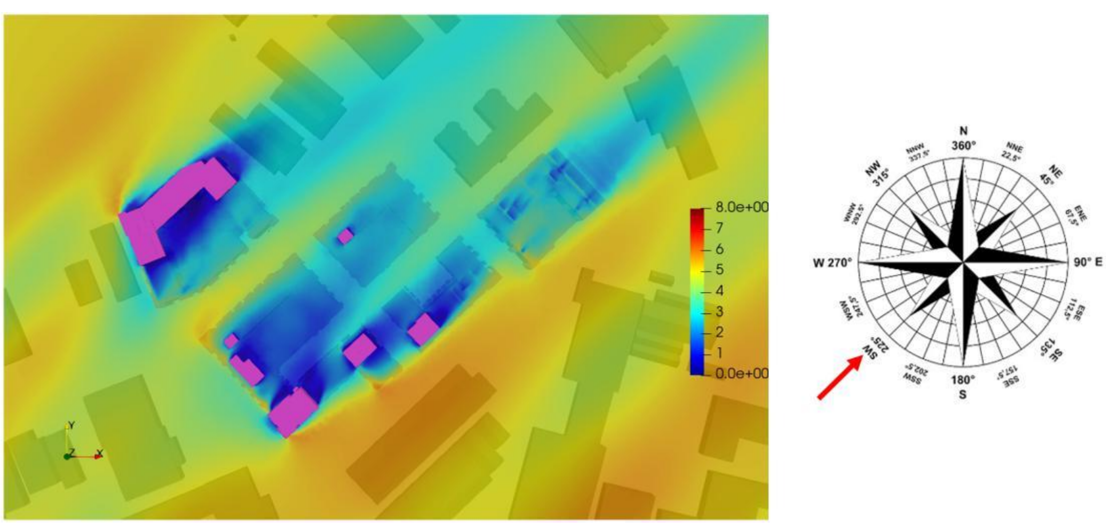


Figure 13.58 Wind Speed Results at 1.5m Above Terraces 3 and 4 - Top View: 225°

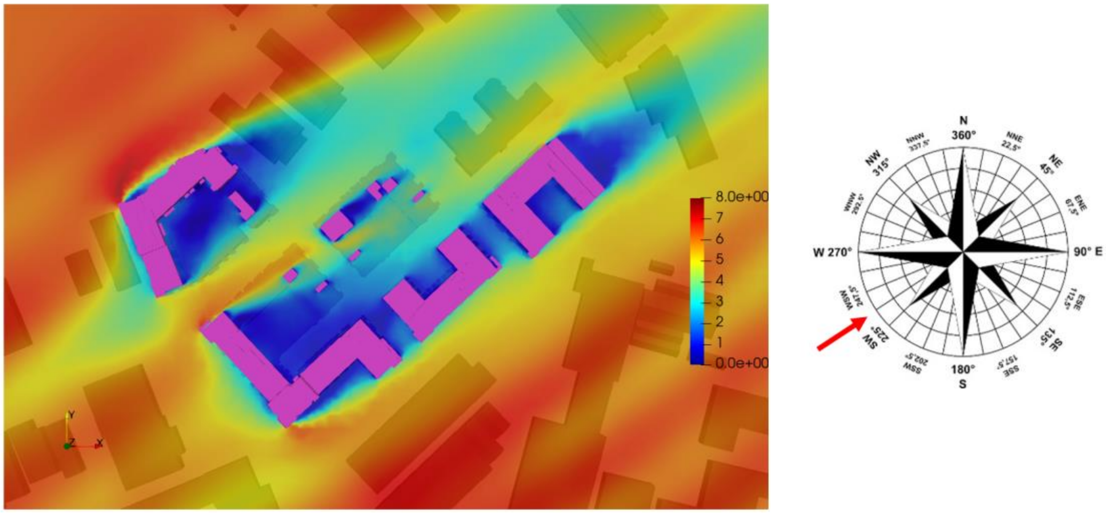


Figure 13.59 Wind Speed Results at 1.5m Above Terraces 1 and 2 - Top View: 236°

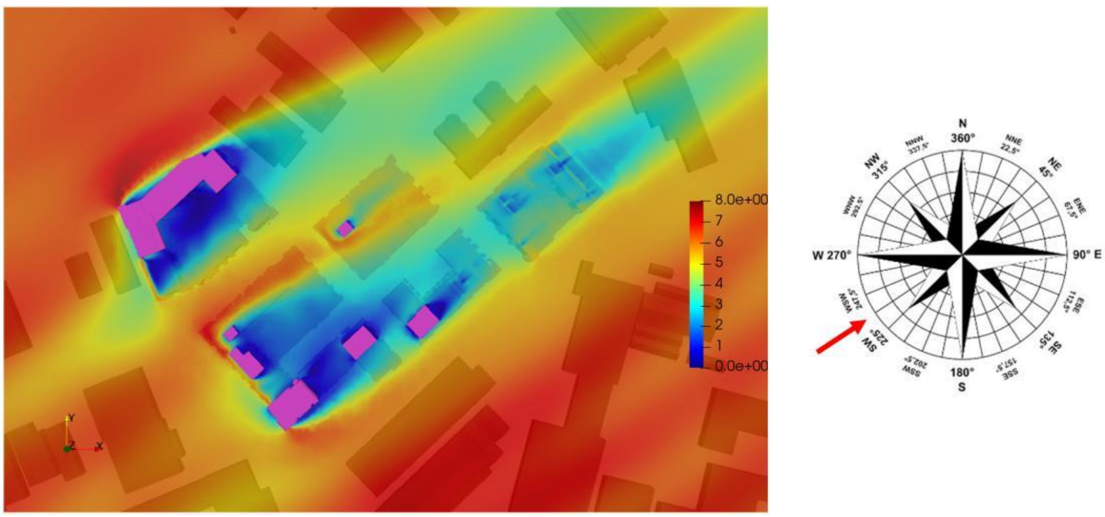


Figure 13.60 Wind Speed Results at 1.5m Above Terraces 3 and 4 - Top View: 236°

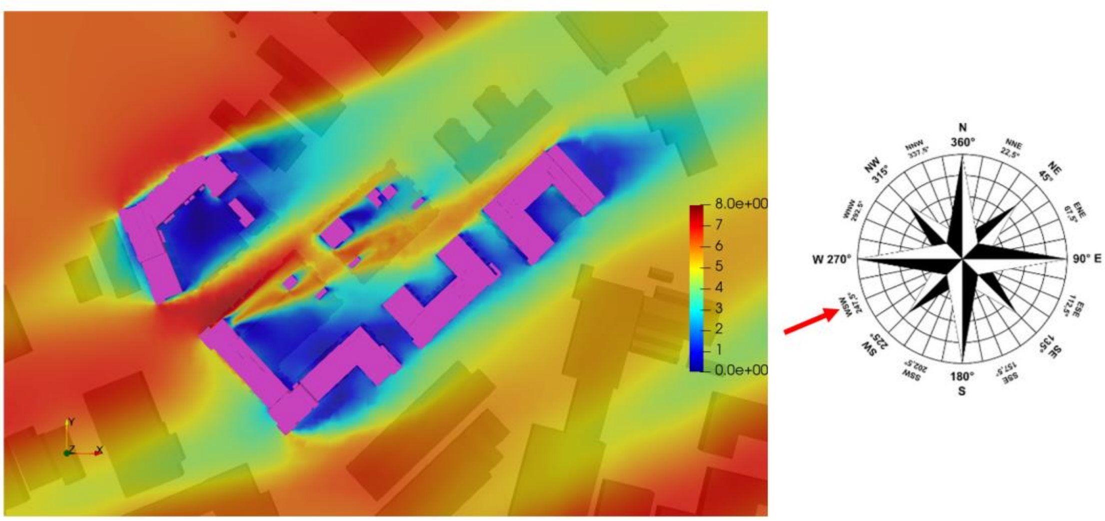


Figure 13.61 Wind Speed Results at 1.5m Above Terraces 1 and 2 - Top View: 247°

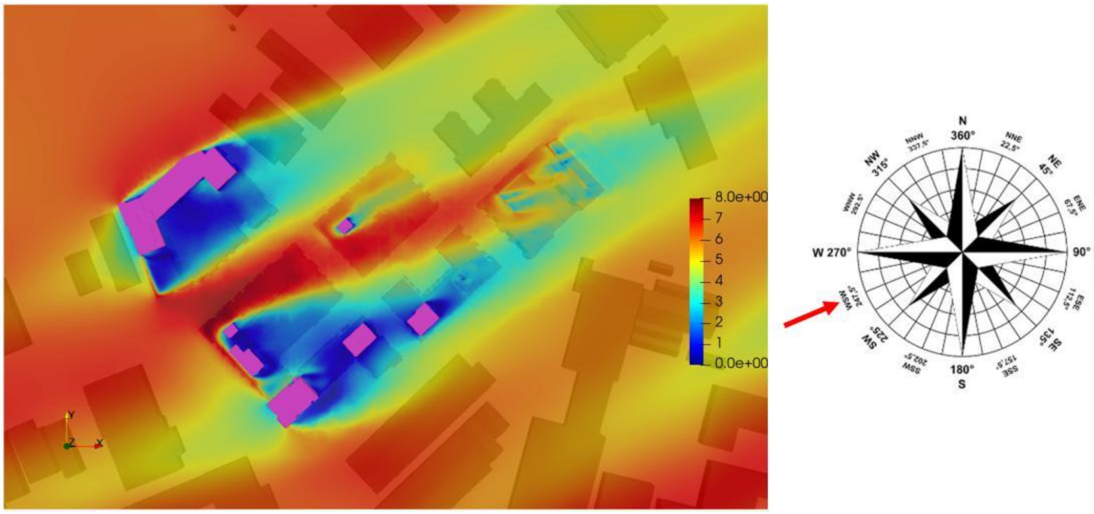


Figure 13.62 Wind Speed Results at 1.5m Above Terraces 3 and 4 - Top View: 247°

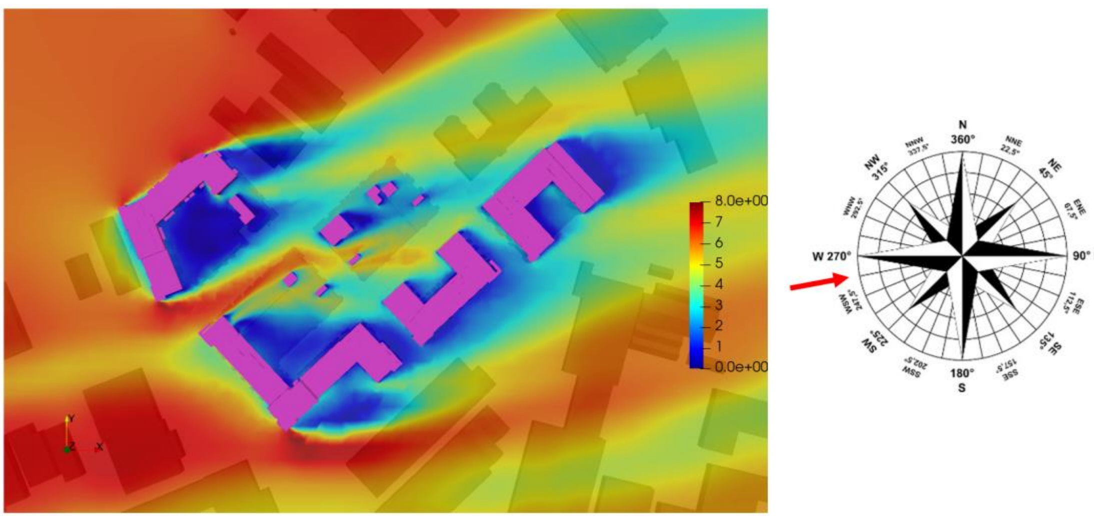


Figure 13.63 Wind Speed Results at 1.5m Above Terraces 1 and 2 - Top View: 258°

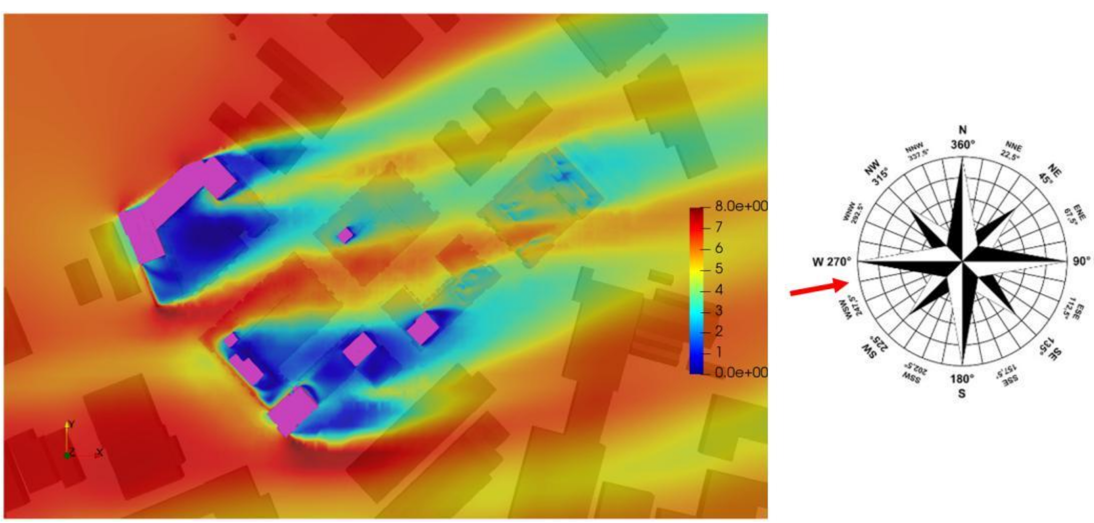


Figure 13.64 Wind Speed Results at 1.5m Above Terraces 3 and 4 - Top View: 258°

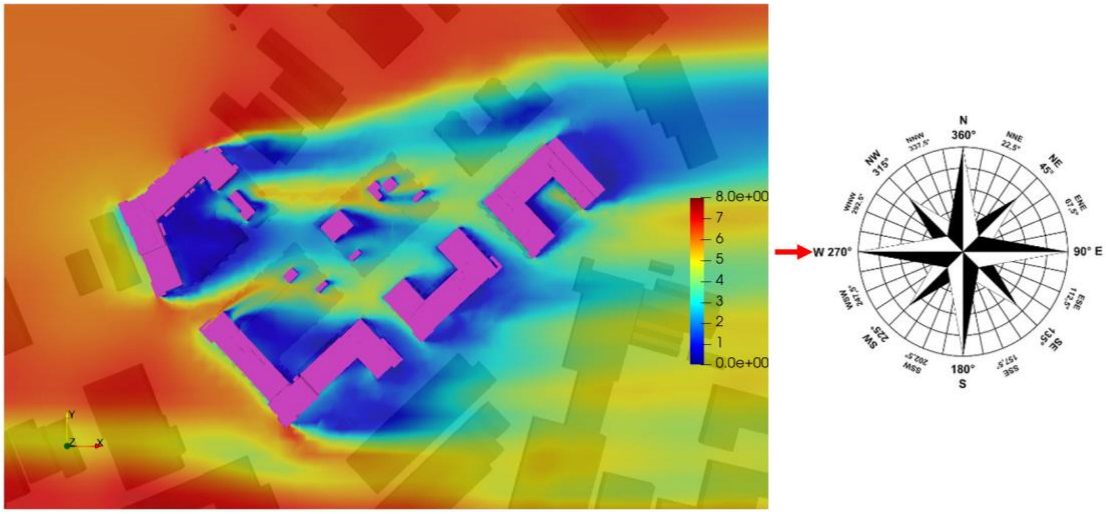


Figure 13.65 Wind Speed Results at 1.5m Above Terraces 1 and 2 - Top View: 270°

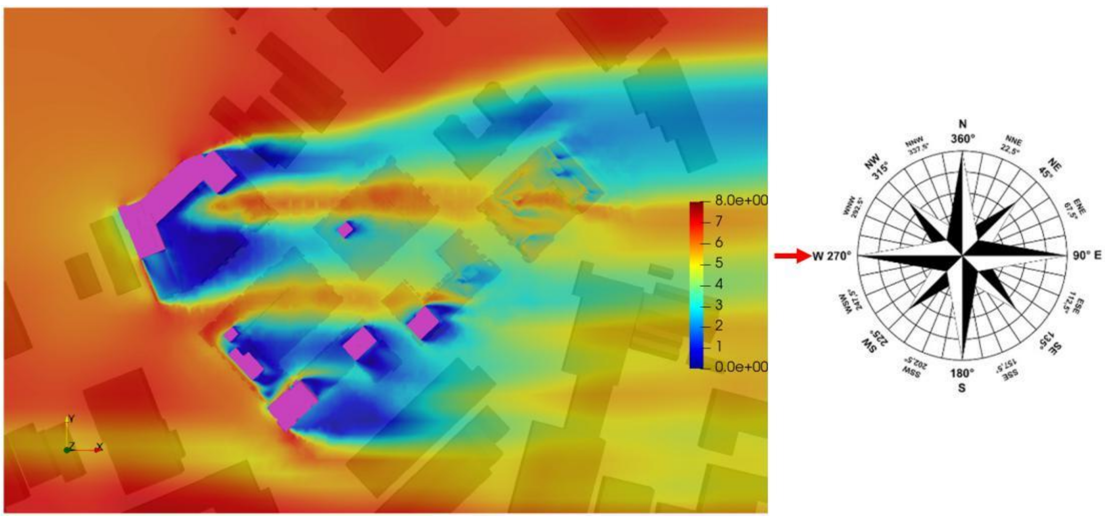


Figure 13.66 Wind Speed Results at 1.5m Above Terraces 3 and 4 - Top View: 270°

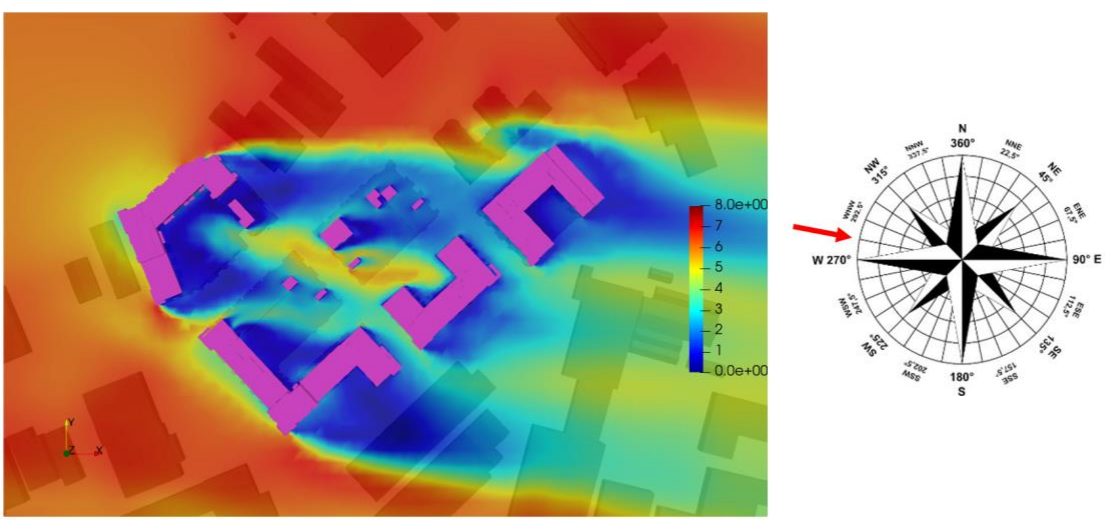


Figure 13.67 Wind Speed Results at 1.5m Above Terraces 1 and 2 - Top View: 281°

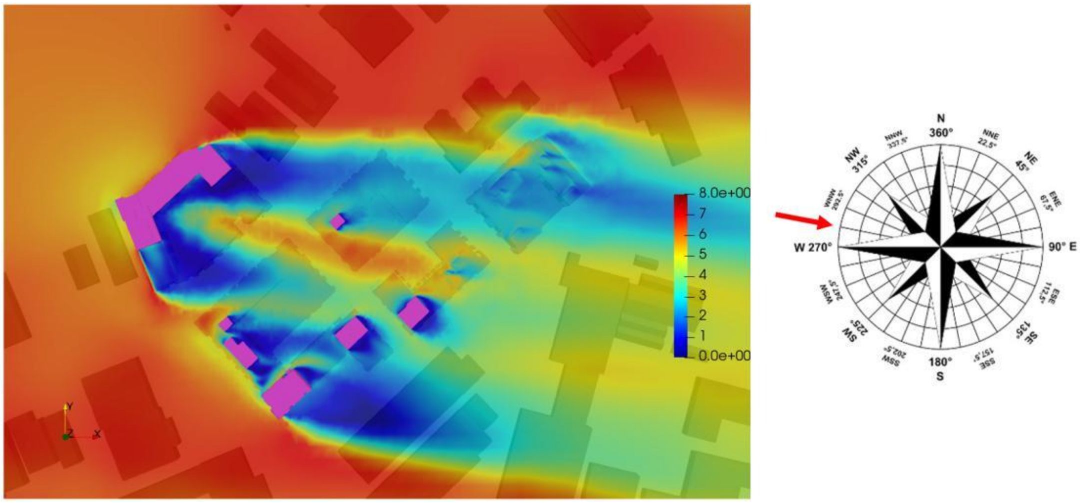


Figure 13.68 Wind Speed Results at 1.5m Above Terraces 3 and 4 - Top View: 281°

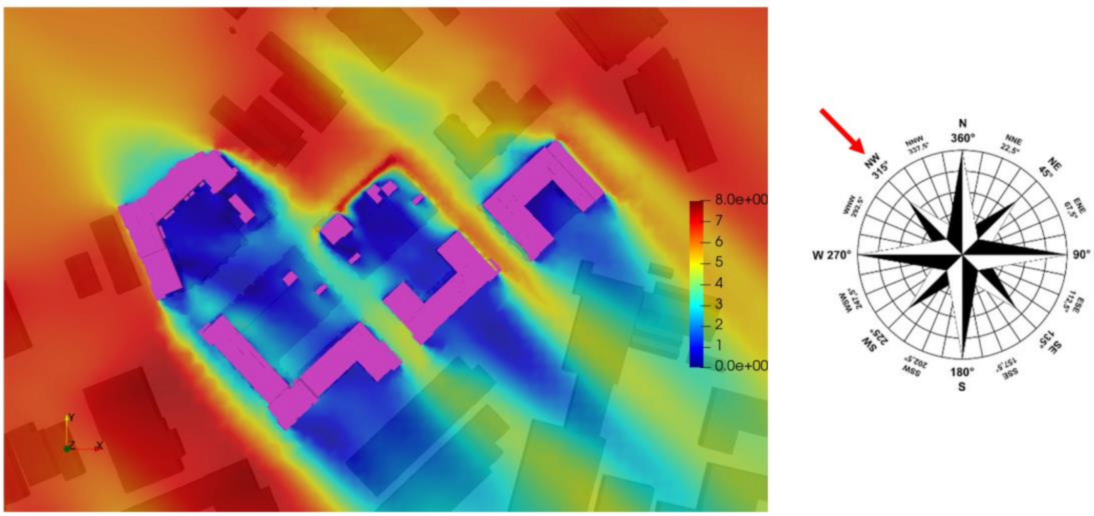


Figure 13.69 Wind Speed Results at 1.5m Above Terraces 1 and 2 - Top View: 315°

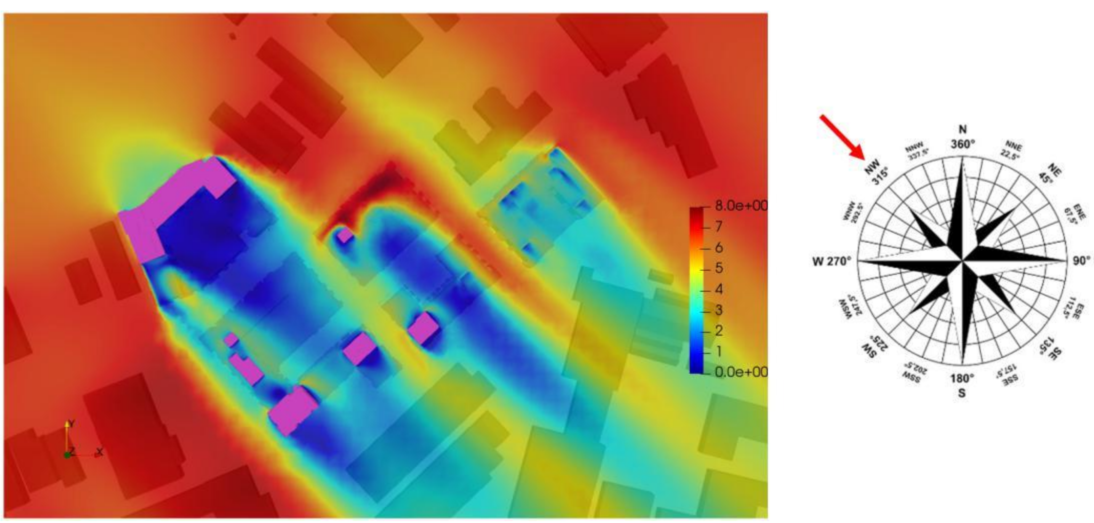


Figure 13.70 Wind Speed Results at 1.5m Above Terraces 3 and 4 - Top View: 315°

13.7.3 Predicted Impact of the proposed development summary

The existing environment and proposed Cookstown Castle Development would receive prevailing winds from South-West. As discussed in the previous sections and demonstrated through this assessment of CFD modelling, all adverse wind impacts has been considered and shows to be suitable to its intended use.

The existing site cumulative assessment has accounted for the modelling and simulation of all the topography and existing developments in the surrounding as the presence of adjacent buildings dictates how the wind will approach the proposed development.

From the wind modelling results, Cookstown Castle Development will introduce no negative wind effect on adjacent, nearby or future phases developments within its vicinity. Wind modelling of future phases around this development will need to be performed for all future phase developments.

13.7.4 Risks to Human Health

This subsection aims to identify areas of Cookstown Castle Development where the pedestrian safety and comfort could be compromised (in accordance with the Lawson Acceptance Criteria previously described). Pedestrian comfort criteria are assessed at 1.5m above ground level.

Discomfort Criteria

Figures 13.72 to 13.95 shows the Lawson comfort categories over the ground floor area and terraces of Cookstown Castle Development. In all cases, the scale used is set out in Figure 13.71.

For the Lawson discomfort criteria, the onset of discomfort depends on the activity in which the individual is engaged and it is defined in terms of a mean hourly wind speed (or GEM) which is exceeded for 5% of the time. Depending on the wind direction, the suitability of the different areas can be assessed using the maps. It can be seen that the wind conditions range from “suitable for long term sitting” to “suitable for walking and strolling” and really rarely are only suitable for “business walking” or “unacceptable for pedestrian comfort”.

The results shown in the maps show that for Ground Floor Level there are no critical area which are unacceptable for pedestrian comfort. Thus, the discomfort criteria is satisfied for all the different cases and in all directions and they are all around the development seems to be always suitable for long term sitting, apart from a couple of small areas, which are indicated with light blue color and which will be mitigated with the implementation of tree landscaping.

All the courtyards are always suitable for long term sitting, short term sitting, standing walking, and strolling activities.

Regarding the terraces, results show that there is no critical area which are unacceptable for pedestrian comfort. All the terraces seem to be always suitable for long term sitting, apart from a small area on the south-east corner of Terrace 1 (Figure 13.82) the south border of Terrace 4 (Figure 13.83) and the north border of Terrace 2 (Figure13.84), which are indicated with light blue color. However, mitigation measures with trellis, pergola structures and multi stem planting will be used to mitigate this area, as presented in Figures 13.96 and 13.97.

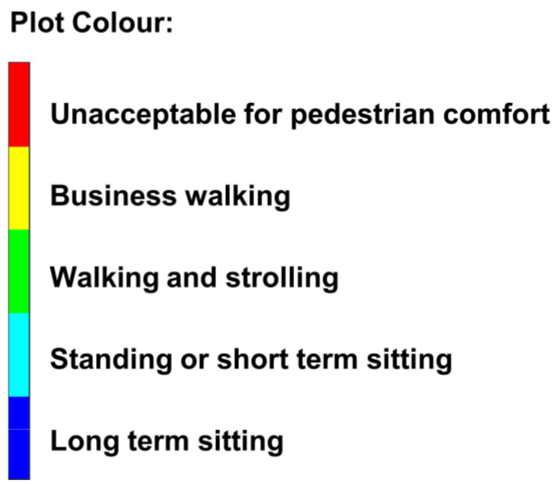


Figure 13.71 Lawson Comfort Categories

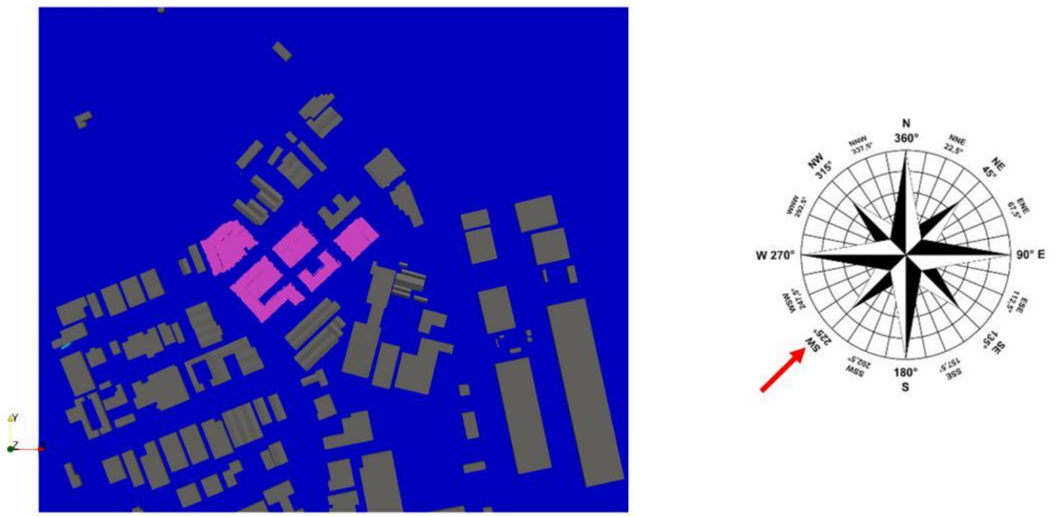


Figure 13.72 Ground Floor - Lawson Discomfort Map: 225°

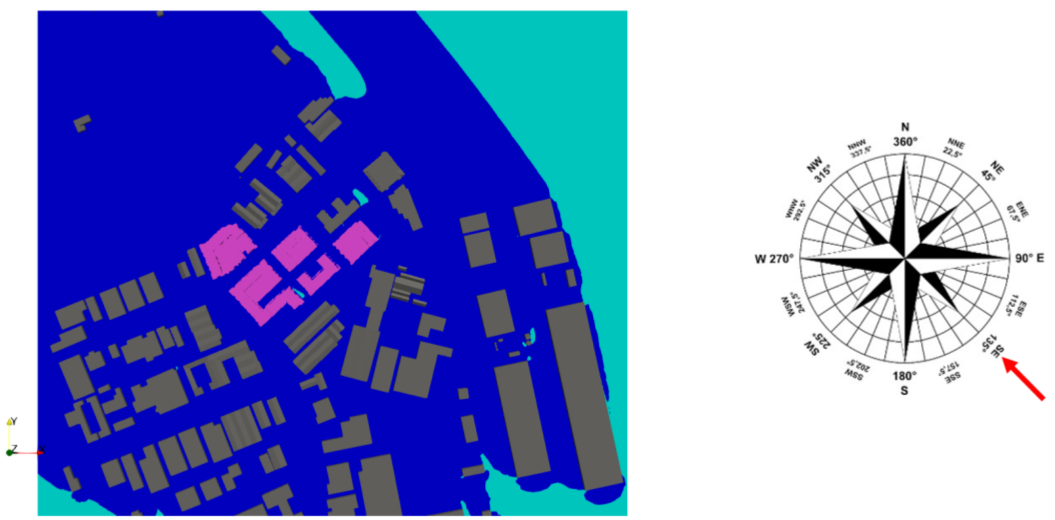


Figure 13.73 Ground Floor - Lawson Discomfort Map: 135°

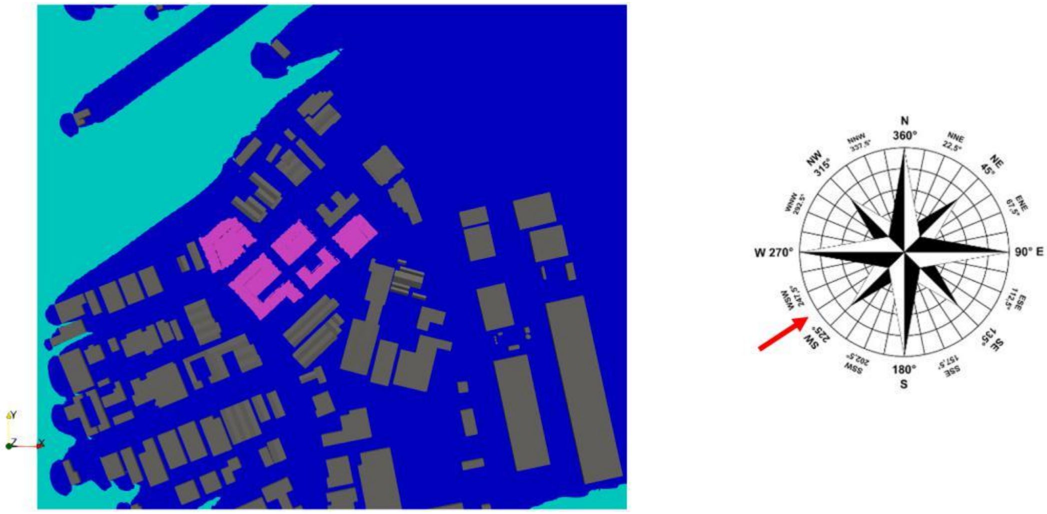


Figure 13.74 Ground Floor - Lawson Discomfort Map: 236°

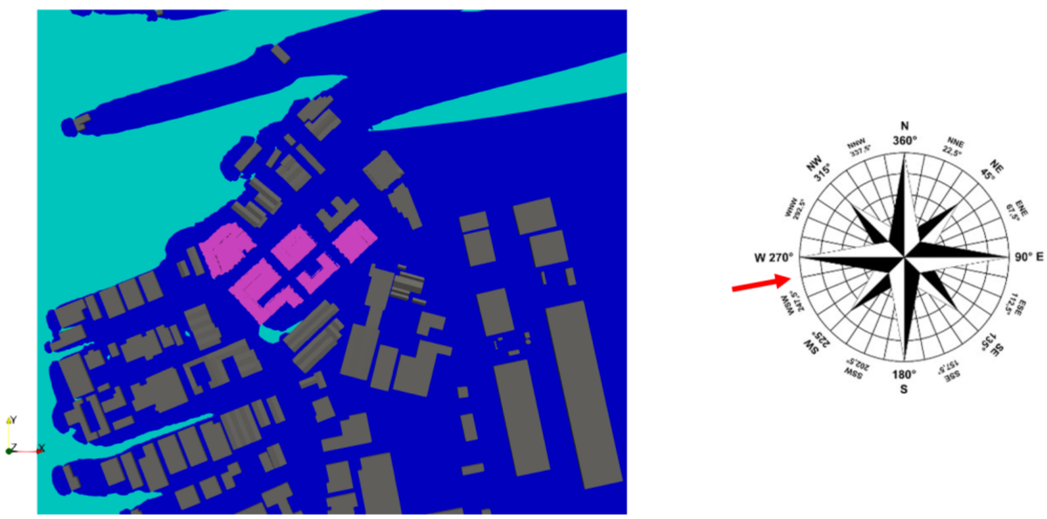


Figure 13.75 Ground Floor - Lawson Discomfort Map: 258°

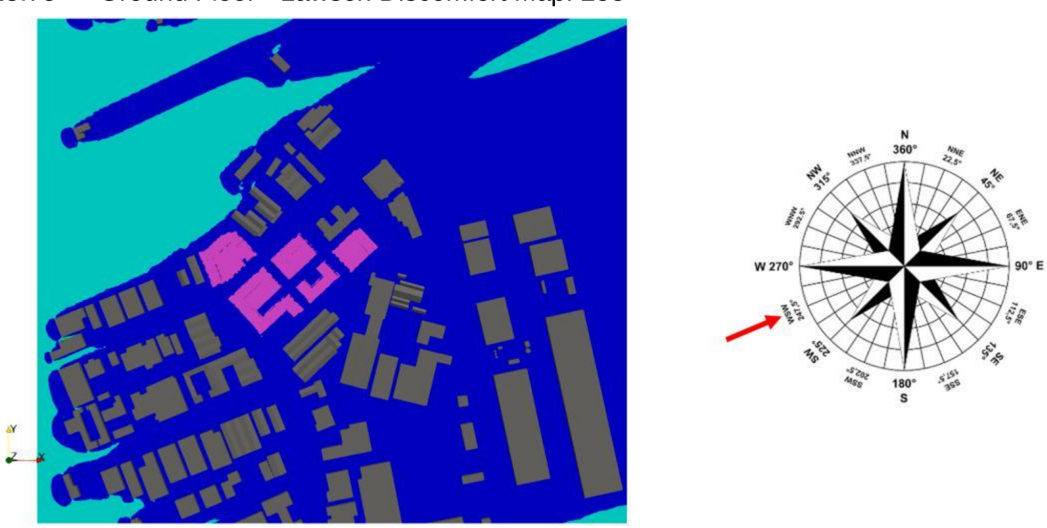


Figure 13.76 Ground Floor - Lawson Discomfort Map: 247°

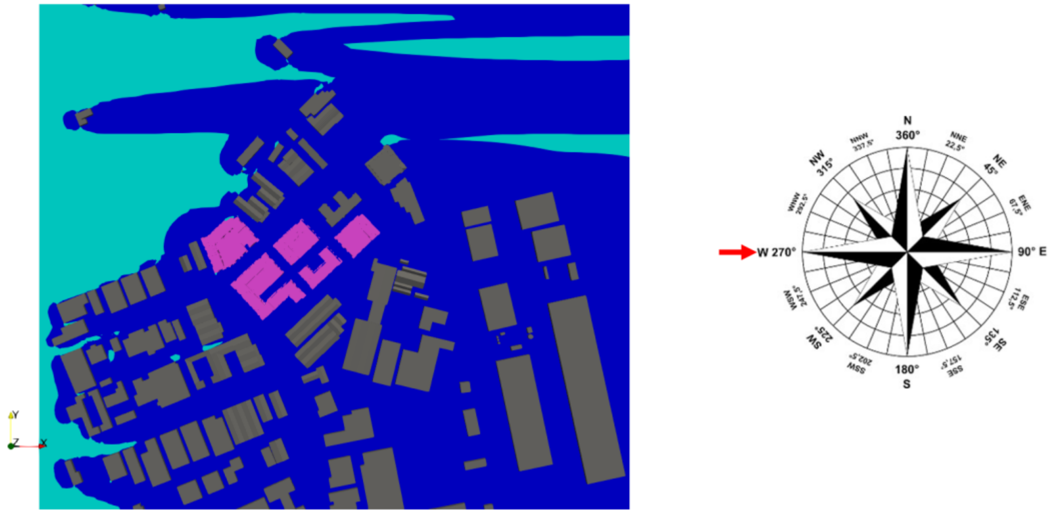


Figure 13.77 Ground Floor - Lawson Discomfort Map: 270°

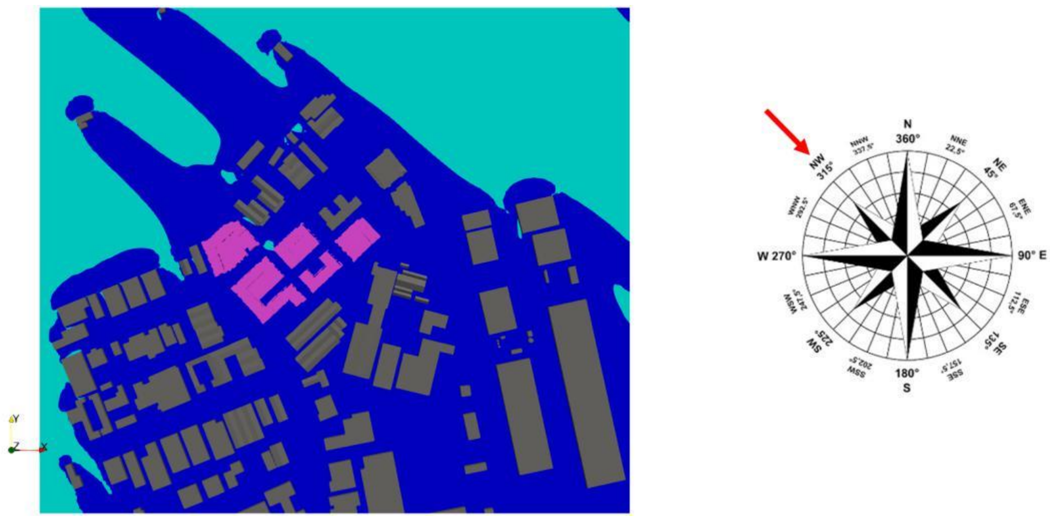


Figure 13.78 Ground Floor - Lawson Discomfort Map: 315°

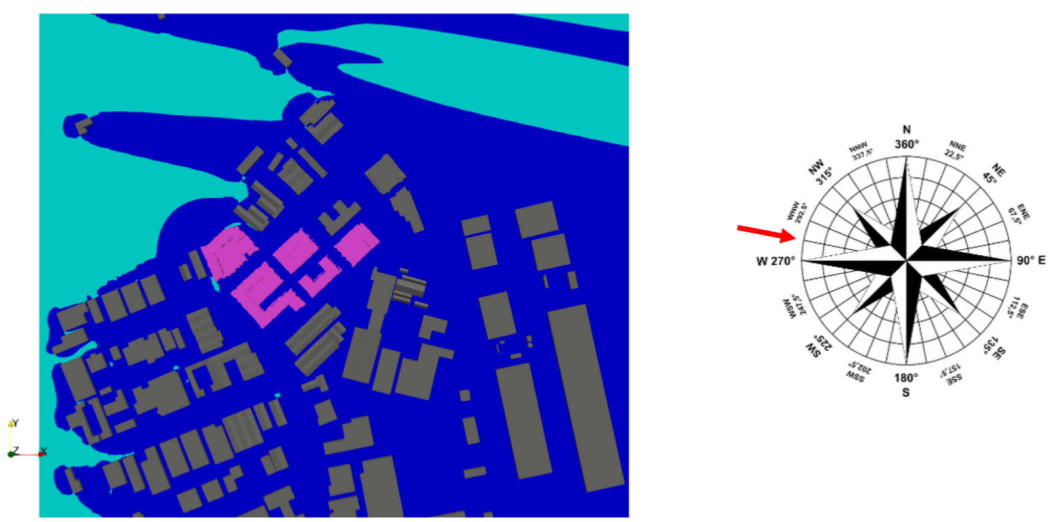


Figure 13.79 Ground Floor - Lawson Discomfort Map: 2

Figure 13.80 Terraces 1 and 2 - Lawson Discomfort Map: 225°

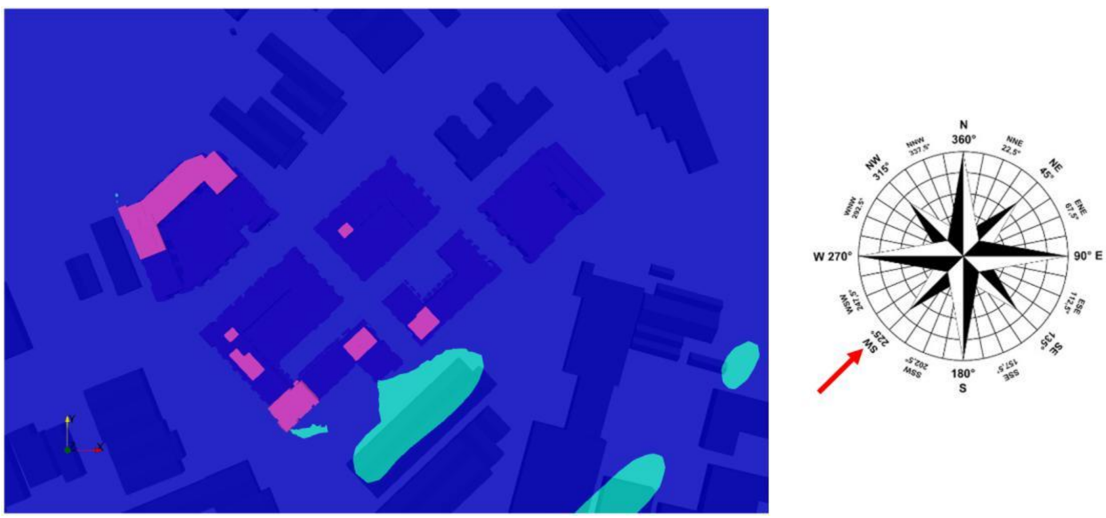


Figure 13.81 Terraces 3 and 4 - Lawson Discomfort Map: 225°

Figure 13.82 Terraces 1 and 2 - Lawson Discomfort Map: 135°

Figure 13.83 Terraces 3 and 4 - Lawson Discomfort Map: 135°

Figure 13.84 Terraces 1 and 2 - Lawson Discomfort Map: 236°

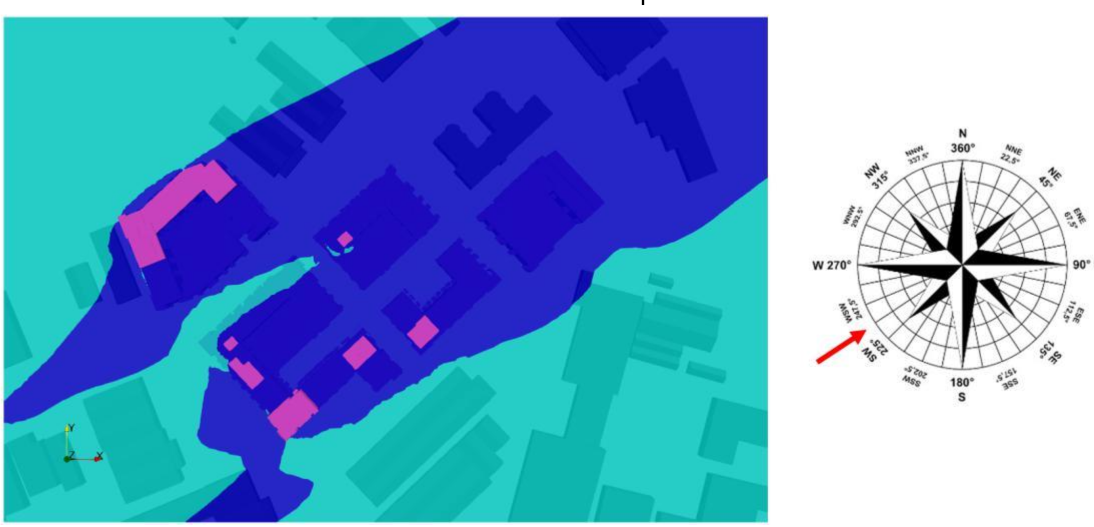


Figure 13.85 Terraces 3 and 4 - Lawson Discomfort Map: 236°

Figure 13.86 Terraces 1 and 2 - Lawson Discomfort Map: 258°

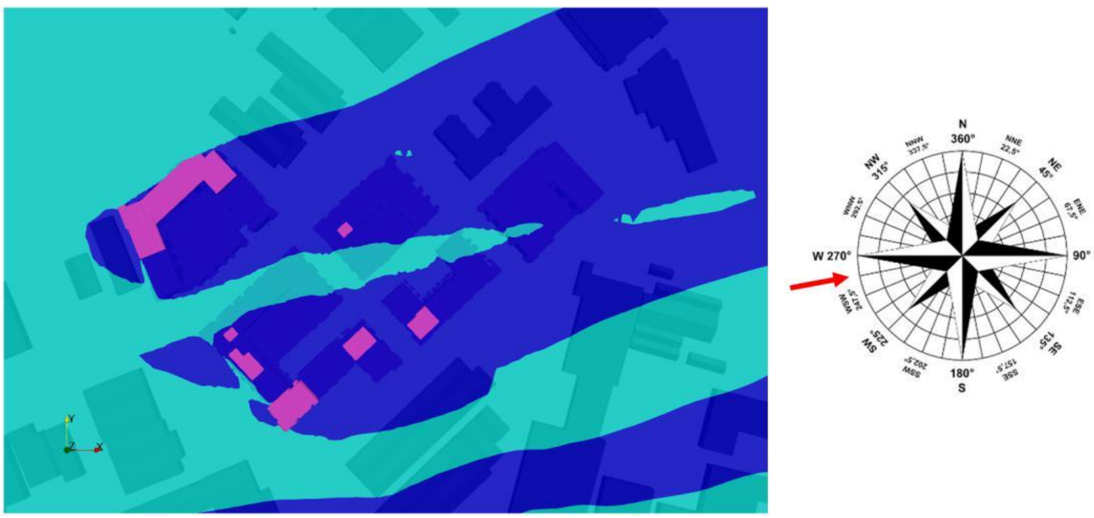


Figure 13.87 Terraces 3 and 4 - Lawson Discomfort Map: 258°

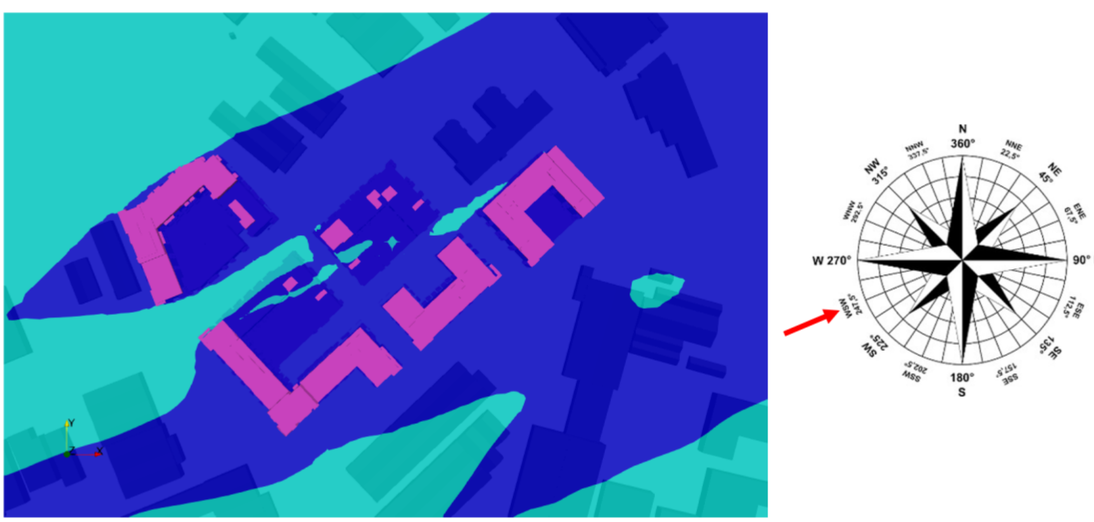


Figure 13.88 Terraces 1 and 2 - Lawson Discomfort Map: 247°

Figure 13.89 Terraces 3 and 4 - Lawson Discomfort Map: 247°

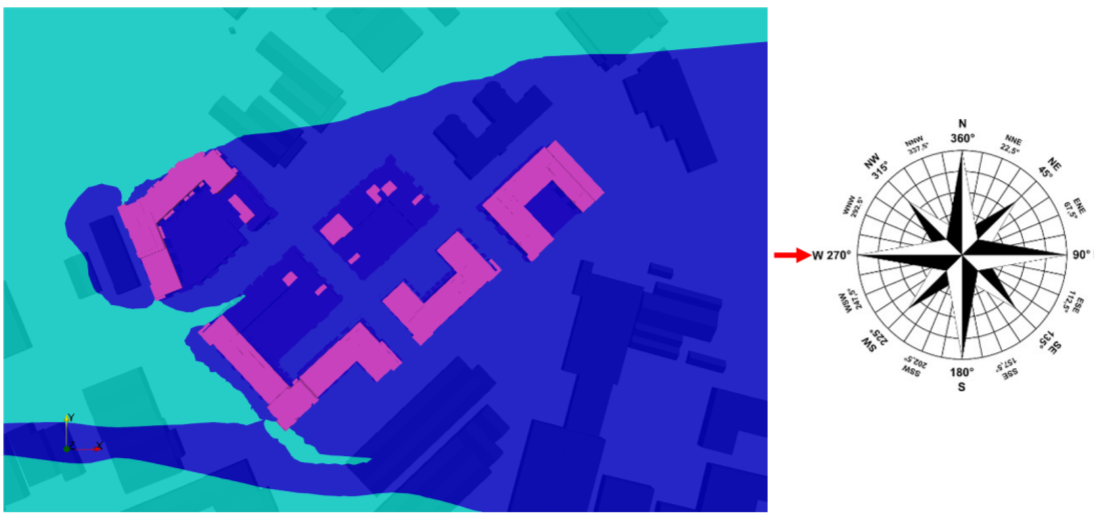


Figure 13.90 Terraces 1 and 2 - Lawson Discomfort Map: 270°

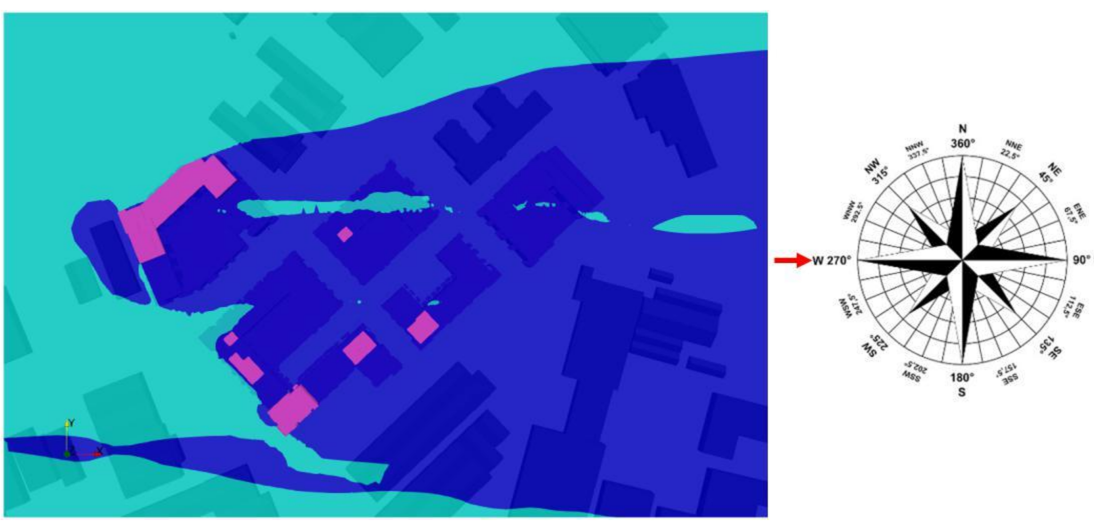


Figure 13.91 Terraces 3 and 4 - Lawson Discomfort Map: 270°

Figure 13.92 Terraces 1 and 2 - Lawson Discomfort Map: 315°

Figure 13.93 Terraces 3 and 4 - Lawson Discomfort Map: 315°

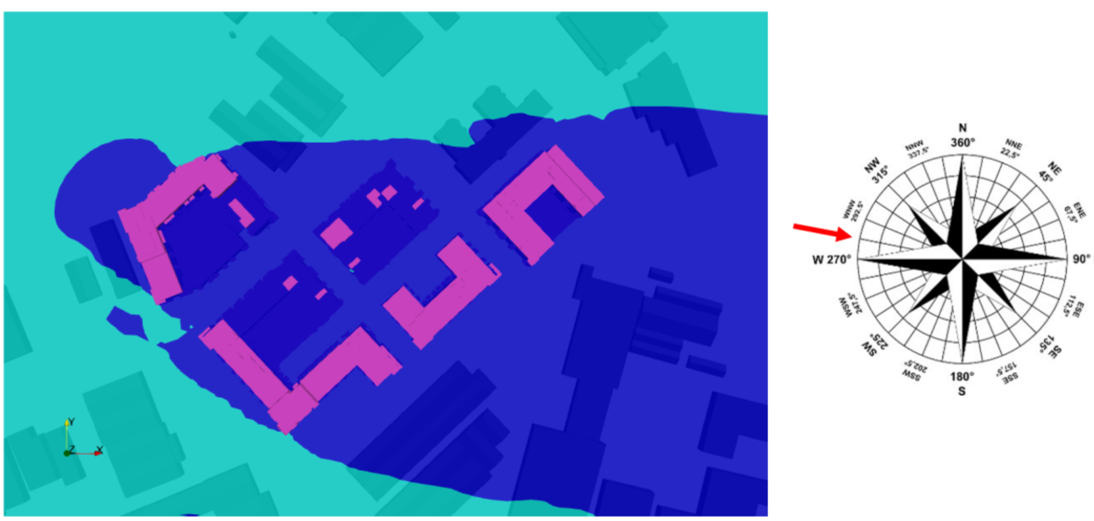


Figure 13.94 Terraces 1 and 2 - Lawson Discomfort Map: 281°

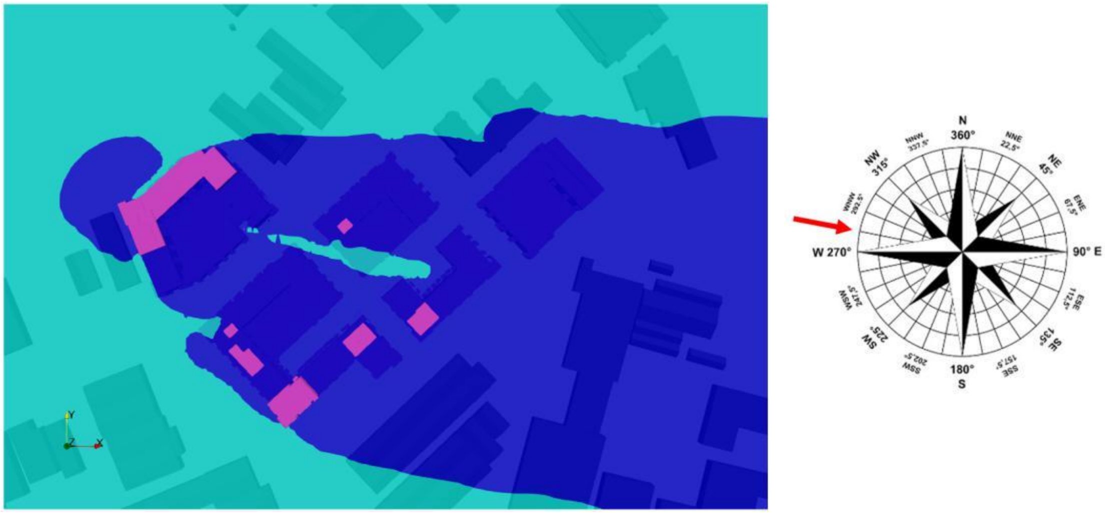


Figure 13.95 Terraces 3 and 4 - Lawson Discomfort Map: 281°

Figure 13.96 Mitigation Measures implemented on the terraces

Figure 13.97 Mitigation Measures implemented on the terraces

Distress Criteria

In addition to the criteria for "discomfort" the Lawson method presents criteria for "distress". The discomfort criteria focus on wind conditions which may be encountered for hundreds of hours per year. The distress criteria require higher wind speeds to be met, but focus on two hours per year. These are rare wind conditions but with the potential for injury rather than inconvenience.

Figure 13.98 shows the hourly wind gust rose for Dublin, from 1985 to 2015. This will be necessary to assess how many hours per year on average the velocity exceed the threshold values.

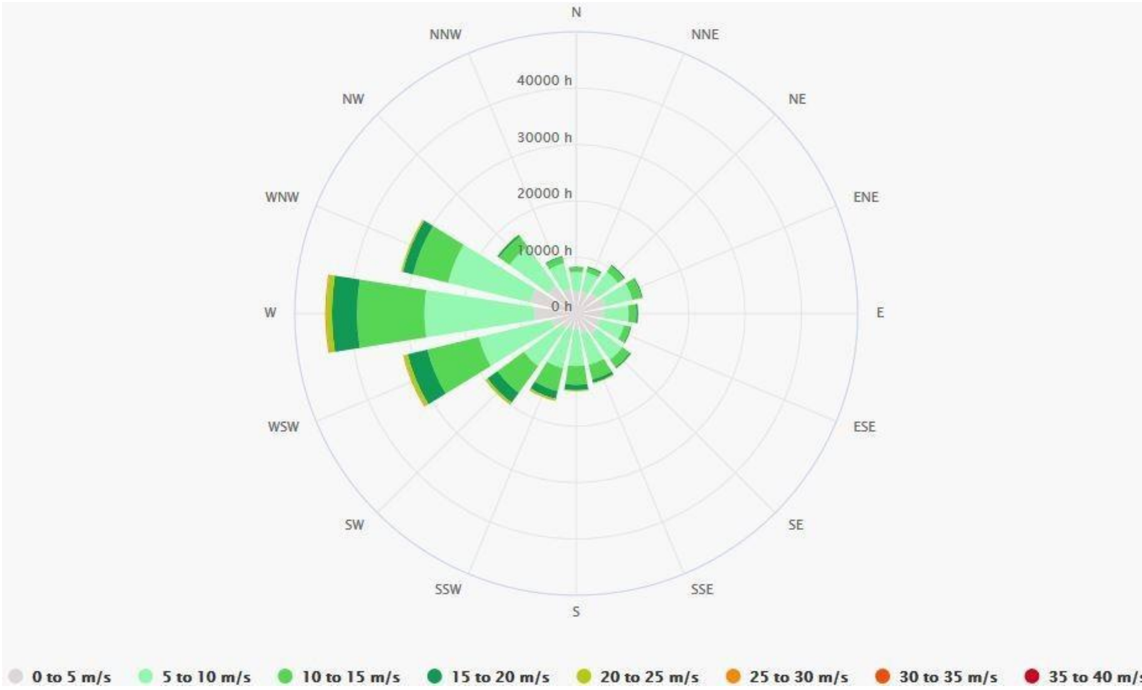


Figure 13.98 Hourly Dublin Wind Gust Rose

The criteria for distress for a frail person or cyclist is 15m/s wind occurring for more than two hours per year. Limiting the results from the above wind rose to the only values above 15m/s (as reported in Figures 13.99 and 13.100 respectively as cumulative hours and cumulative percentage), it is possible to see how many hours in 30 years the gust velocity of 15m/s is exceed at pedestrian level in each direction.

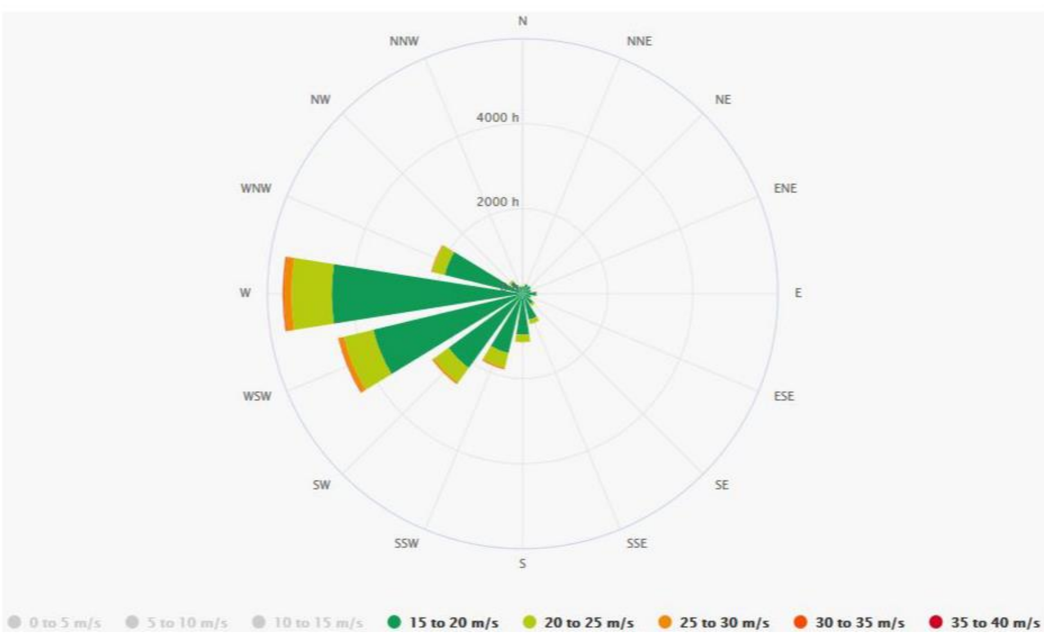


Figure 13.99 Hourly Dublin Wind Gust Rose - Cumulative hours when the velocity is above 15m/s

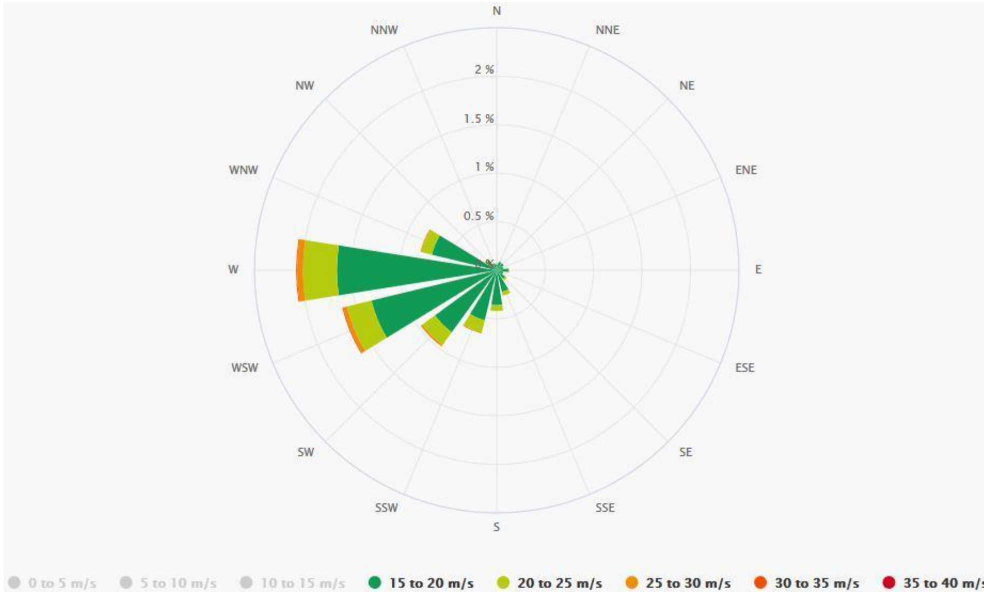


Figure 13.100 Hourly Dublin Wind Gust Rose - Cumulative percentage of time when the velocity is above 15m/s

A total of 2 hours per years corresponds to 0.02% in one year, which means 0.6% in 30 years. Looking at the wind roses above, it is possible to notice that a velocity of 15m/s was reached in Dublin only for the following directions (in increasing order of percentage) over the years 1985-2015:

1. West 270°
2. West-South-West 247.5°
3. South-West 225°

For this reason, it is of interest to show the distress results for these directions. Figure 13.102 below combines all the above directions together and shows the areas where the measured velocity is above 15 m/s. Figure 13.101 shows the scale used in this case. Results show that there are not critical areas where the velocity increases above 15 m/s.

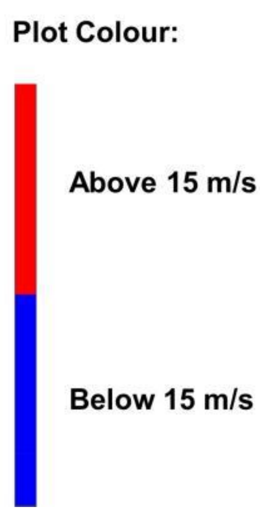


Figure 13.101 Lawson Distress Categories - Frail Person or Cyclist

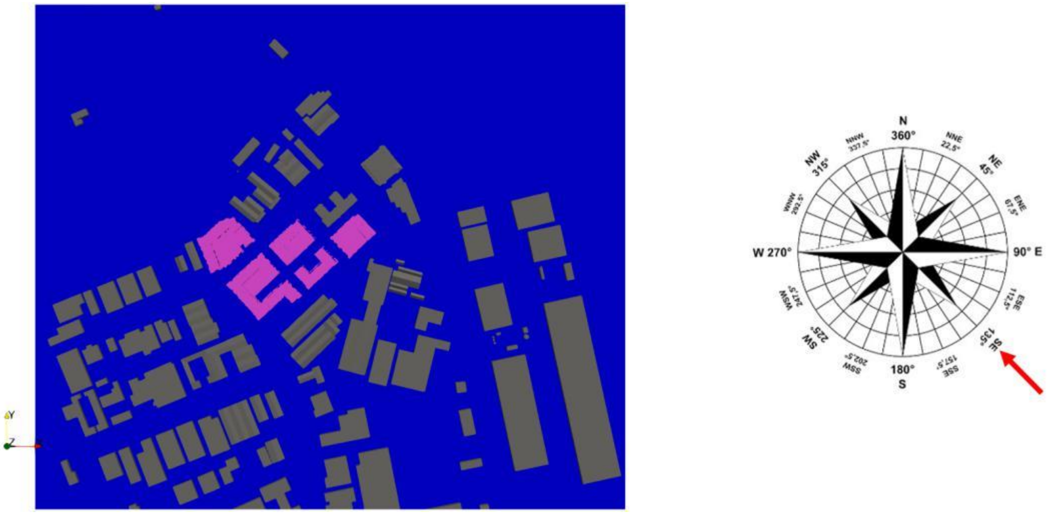


Figure 13.102   Lawson Distress Map - Frail Person or Cyclist - 270°, 247.5°, 225°

The criteria for distress for a member of the general population is 20m/s wind occurring for more than two hours per year. Limiting the results from the above wind rose to the only values above 20m/s (as reported in Figures 13.103 and 13.104 respectively as comulative hours and cumulative percentage), it is possible to see how many hours in 30 years the gust velocity of 20m/s is exceed at pedestrian level in each direction.

Figure 13.103   Hourly Dublin Wind Gust Rose - Cumulative hours when the velocity is above 20m/s

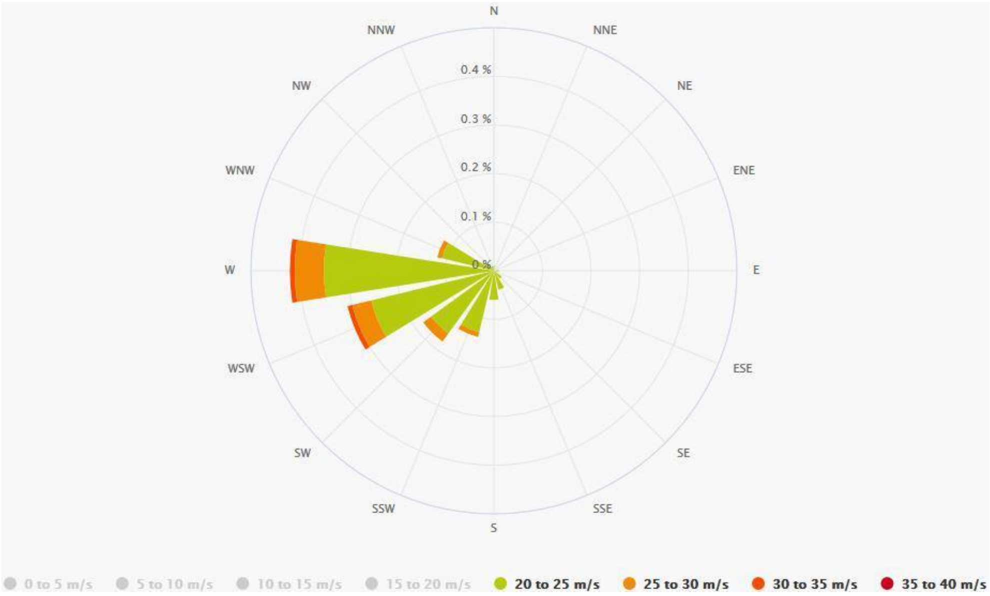


Figure 13.104 Hourly Dublin Wind Gust Rose - Cumulative percentage of time when the velocity is above 20m/s

A total of 2 hours per years corresponds to 0.02% in one year, which means 0.6% in 30 years. Looking at the wind roses above, it is possible to notice that a velocity of 20m/s was never reached in Dublin over the years 1985-2015. For this reason, it is not of interest to show the distress results for any of the wind directions and the criteria is always satisfied.

Summary of Cumulative Predicted Impact of the Proposed Development

From the simulation results the following observations are pointed out:

- The proposed Cookstown Castle Development will produce a quality environment that is attractive and comfortable for pedestrians at ground floor.
- Areas around the development where velocities can be higher have been identified near the corners of the blocks. However, these can be mitigated using tree landscaping, with particulate attention to the corners.
- Funnelling effects are experienced on some of the main roads around the development and on the roads in-between the different blocks. Possible solutions for this could be horizontal canopies, which improve pedestrian level wind conditions. Parapet walls around a canopy can make the canopy more effective. Sloped canopies only provide partial deflection of downward wind flow. Finally, a colonnade on the windward face of the base building could provide the pedestrian with a calm area where to walk while being protected or a breeze walking space outside the colonnade zone. Moreover, the implementation of tree landscaping in these areas will mitigate these effects.
- Courtyards seem to be well shielded. However, some recirculation effect have been found for certain wind directions. The implementation of tree landscaping in these areas will mitigate these effects.
- On the terraces, higher velocities can be found for some directions, only in some areas of the terraces and often corresponding to the edges of them. However, these velocities are below the threshold values defined by the acceptance criteria. Also, mitigation measures with trellis, pergola structures and multi stem planting will mitigate these velocities.

- The pedestrian comfort assessment, performed at Ground Floor level and on the terraces according to the Lawson criteria, identified the areas that are suitable for the different pedestrian activities in order to guarantee pedestrian comfort. The area all around the development seems to be suitable for every activity, including long term sitting, apart from a couple of small areas, which are indicated with light blue color and which will be mitigated with the implementation of tree landscaping. The courtyards are always suitable for long term sitting, short term sitting, standing, walking and strolling activities. All the terraces seem to be always suitable for long term sitting, apart from a small area on the south-east corner of Terrace 1 the south border of Terrace 4 and the north border of Terrace 2, which are indicated with light blue color. However, mitigation measures with trellis, pergola structures and multi stem planting will be used to mitigate this area. Moreover, in terms of distress, no critical conditions were found for “Frail persons or cyclists” and ”General Public” in the surrounding of the development.

13.8 Monitoring

13.8.1 Construction Phase

There is no particular requirement to monitor wind impact during construction phase as the designated amenity areas will not be in use during this phase of the project.

13.8.2 Operational Phase

During the development operational phase, it has been designed to conform to acceptable Lawson Criteria for Comfort and Distress in accordance with the Wind Beaufort Scale.

13.9 Reinstatement

13.9.1 Construction Phase

Not applicable.

13.9.2 Operational Phase

Not applicable.

13.10 Difficulties Encountered

No difficulties were encountered during the assessment of wind and microclimate impacts on Cookstown Castle Development or its existing environments.

13.11 Conclusions

13.11.1 Conclusions and comments on Microclimate Study

This report presents the CFD modelling assumptions and results of Wind and Microclimate Modelling of Cookstown Castle Development, Cookstown, Tallaght, Dublin 24.

Results of this are utilized by the design team to configure the optimal layout for Cookstown Castle Development for the aim of achieving a high-quality environment for the scope of use intended for each areas/building (i.e. comfortable and pleasant for potential pedestrian) and not to introduce any critical wind impact on the surrounding areas and on the existing buildings (in accordance with the Lawson Acceptance Criteria).

1. EXISTING RECEIVING ENVIRONMENT SUMMARY:

The wind desktop study of the existing receiving environment showed that:

- The wind profile was built using the annual average of meteorology data collected at Dublin Airport Weather Station. In particular, the local wind climate was determined from historical meteorological data recorded 10 m above ground level at Dublin Airport. 18 different scenarios were selected in order to take into consideration all the different relevant wind directions. In particular, a total of 18 compass directions on the wind rose are selected. For each direction, the reference wind speed is set to the 5% exceedance wind speed for that direction, i.e. the wind speed that is exceeded for over 5% of the time whenever that wind direction occurs.

- The wind profile built using the data from Dublin Airport, is also compared with the one obtained using the data collected on-site. Except few differences, both the wind speed daily mean and the wind gust daily mean recorded on site follow the same patterns as the ones recorded at Dublin Airport. The speed levels registered on-site are in few cases slightly lower. This is due to the fact that, despite its vicinity to the coast, the site is located close to the urban environment thus much more shielded if compared with Dublin Airport. This confirms the fact that using wind data from Dublin Airport still ensures a conservative analysis of the wind impact on the development.

- The prevailing wind directions for the site are identified in the West, West South-West and South-East with magnitude of approximately 6m/s.

2. POTENTIAL AND CUMULATIVE IMPACT OF THE PROPOSED DEVELOPMENT SUMMARY:

Micro-climate Model Assessment of Cookstown Castle Development and it's environment was performed utilizing a CFD (Computational Fluid Dynamics) methodology. 3 worst case wind scenarios are selected for presentation in this report, as these scenarios and directions showed to be the most relevant wind speeds.

CFD modelled results of the development scheme showed that:

- The proposed Cookstown Castle Development will produce a high quality environment that is attractive and comfortable for pedestrians of all categories.

- The Surrounding environment and developments properly shields all paths/walk-ways around and within the development. Pedestrian footpaths are always successfully shielded and comfortable.

- Areas around the development where velocities can be higher have been identified near the corners of the buildings and on some of the main roads across the blocks and around the development. However, these can be mitigated using tree landscaping, with particular attention to the corners of the buildings.

- Funnelling effects are experienced on some of the main roads around the development and on the roads in-between some of the blocks. These can be mitigated using horizontal canopies, parapet walls around a canopy, sloped canopies, a colonnade on the windward face of the base building. However, these conditions are not occurring at a frequency that would compromise the pedestrian comfort, according to the Lawson Criteria. Moreover, the implementation of tree landscaping in these areas will mitigate these effects.

- Regarding the courtyards some recirculation effect have been found for certain wind directions. However, the implementation of tree landscaping in these areas will mitigate these effects.

- On the terraces, higher velocities can be found for some directions, only in some areas of the terraces and often corresponding to the edges of them. However, these velocities are below the threshold values defined by the acceptance criteria. Also, mitigation measures with trellis, pergola structures and multi stem planting will mitigate these velocities.

- The proposed development does not impact or give rise to negative or critical wind speed profiles at the nearby adjacent roads, or nearby buildings.

- The pedestrian comfort assessment, performed at Ground Floor level and on the terraces according to the Lawson criteria, identified the areas that are suitable for the different pedestrian activities in order to guarantee pedestrian comfort. The area all around the development seems to be suitable for every activity, including long term sitting, apart from a couple of small areas, which are indicated with light blue color and which will be mitigated with the implementation of tree landscaping. The courtyards are always suitable for long term sitting, short term sitting, standing, walking and strolling activities. All the terraces seem to be always suitable for long term sitting, apart from a small area on the south-east corner of Terrace 1 the south border of Terrace 4 and the north border of Terrace 2, which are indicated with light blue color. However, mitigation measures with trellis, pergola structures and multi stem planting will be used to mitigate this area. Moreover, in terms of distress, no critical conditions were found for “Frail persons or cyclists” and ”General Public” in the surrounding of the development.

- During Cookstown Castle Development construction phase the predicted impacts are classified as negligible.

Therefore, the CFD study carried out has shown that under the assumed wind conditions typically occurring within Dublin for the past 30 years:

- **The development is designed to be a high-quality environment for the scope of use intended of each areas/building (i.e. comfortable and pleasant for potential pedestrian), and,**

- **The development does not introduce any critical impact on the sur-rounding buildings, or nearby adjacent roads.**

13.12 References

Lawson, T.V., 2001, ‘Building Aerodynamics’, Imperial College Press, London

Simiu, E., 2011, ‘Design of buildings for wind: a guide for ASCE 7-10 Standard users and designers of special structures’, 2nd Edition, John Wiley and Sons, Inc., Hoboken, New Jersey, U.S.A.

Building Aerodynamics, Tom Lawson FREng. Imperial College Press, 2001

Blocken, B., 2015. Computational Fluid Dynamics for Urban Physics: Importance, scales, possibilities, limitations and ten tips and tricks towards accurate and reliable simulations. Building and Environment.

Blocken, B., Janssen, W.D. and van Hooff, T., 2012. CFD simulation for pedestrian wind comfort and wind safety in urban areas: General decision framework and case study for the Eindhoven University campus. Environmental Modelling and Software, 30, pp.15–34.

Franke, J., Hellsten, A., Schlunzen, H., Carissimo, B, Ed. (2007); Best Practice Guidelines for the CFD Simulation of Flows in the Urban Environment, University of Hamburg

14.0 INTERACTIONS BETWEEN ENVIRONMENTAL FACTORS

14.1 Introduction

This section of the EIAR has been prepared by Hughes Planning and Development Consultants in association with the various EIAR consultants. More specifically, this chapter of the EIAR was prepared jointly by Mr. Kevin Hughes, Director, and Ms. Margaret Commane, Associate, with Hughes Planning and Development Consultants.

Mr. Kevin Hughes of Hughes Planning and Development Consultants, graduated from University College Dublin (UCD) with a Masters in Regional and Urban Planning (MRUP) in 2002, having previously completed a Bachelor of Arts Degree in Sociology from National University of Ireland in 1999. Kevin has over 18 years professional experience in the field of planning and development consultancy, which has included providing consultancy services in respect of several major urban regeneration projects including EIA. Kevin is currently the Director of Hughes Planning and Development Consultants.

Ms. Margaret Commane of Hughes Planning and Development Consultants, graduated from University College Cork (UCC) with a Masters in Planning and Sustainable Development (MPLAN) in 2012, having previously completed a Bachelor of Arts Degree in Geography and Legal Science from National University of Ireland in 2010. Margaret has over 7 years professional experience in the field of planning and development consultancy, which has included providing consultancy services in respect of several major urban regeneration projects including EIA. Margaret is currently an Associate in the Practice of Hughes Planning and Development Consultants.

The preceding Chapters 4.0 to 13.0 of this EIAR identify the potential environmental impacts that may have occur as a result of the proposed development in terms of Population and Health; Biodiversity; Land, Soils, and Geology; Water and Hydrology; Noise and Vibration; Air Quality and Climate; Material Assets; Archaeology, Architectural and Cultural Heritage; Landscape and Visual Amenity; and Wind and Microclimate. All of the potential significant effects of the proposed development and the measures proposed to mitigate them have been outlined in the preceding chapters of this report. However, for any development with the potential for significant environmental effects there is also the potential for interaction amongst these potential significant effects. The result of interactive effects may exacerbate the magnitude of the effects or ameliorate them, or have a neutral effect. The purpose of this chapter is to identify and draw attention to interactions and interdependencies between the various chapters of this EIAR and associated topic specific assessments.

As previously stated, the scoping process of this EIAR occurred concurrently with the masterplanning process. As members of the design team contributed to this EIAR, detailed elements of the scheme evolved. The relevant consultants liaised with each other and the project architects, engineers and landscape architects where necessary to review the proposed scheme and incorporate suitable mitigation measures where necessary. For example, following a road safety audit alterations were made to the road layout. Most of the interactions informed the design approach undertaken by the project architect in the first instance and were considered to be design considerations and site constraints.

14.2 Impact Definitions

Section 3.7.7 of the *Draft Guidelines on the Information to be Contained in Environmental Impact Statements* published by the EPA provides guidance on how to measure and define potential impacts on the environment. The following assessment criteria have been used to assess significant interactions:

Impact Definition	**Impact Definition**
Neutral	An interaction which does not affect the environment
Positive	An interaction which improves the quality of the environment
Negative	An interaction which reduces the quality of the environment
Significance	**Definition**
Imperceptible	*Capable of measurement but without noticeable consequences*
Not Significant	*Causes noticeable changes in the character of the environment but without noticeable consequence*
Slight	*Causes noticeable changes in the character of the environment without affecting sensitivity*
Moderate	*Alters character of environment consistent with existing and emerging trends*
Significant	*By its character, magnitude and duration or intensity alters a sensitive aspect of the environments*
Profound	*Obliterates sensitive characteristics*

Table 14.1 Assessment criteria utilised in assessing the significance of interactions

14.3 Summary of Principal Interactions

The following are the interactions anticipated from the proposed development: -

Subject Interaction	**Interaction With**	**Interactions/Inter-Relationships**	**Impact *Significance***
Population & Human Health	Air Quality & Climate	Construction vehicles, generators etc., may give rise to some CO2 and N2O emissions. However, due to the short-term and temporary nature of these works the impact on climate will not be significant.	Neutral *Slight*
Population & Human Health	Biodiversity	There is potential for disturbance to breeding birds to occur during initial construction stages. Site clearance will take place outside of the breeding season (March 31st to September 1st to avoid direct injury and disturbance to breeding birds.	Neutral *Not Significant*
Biodiversity	Ecology (species and habitats of conservation value)	The site comprises primarily of build land. Demolition and construction will remove existing habitats on site. No species of conservation importance are noted on site. Standard construction phase measures are proposed in relation Herring gulls, dust and the prevention of downstream impacts.	Neutral *Not Significant*
Biodiversity	Designated Conservation Sites	The site is not within a designated site and there is no direct pathway. Standard construction phase measures are proposed in relation dust and the prevention of downstream impacts.	Neutral *Not Significant*

Biodiversity	Overall Ecology	SuDs measures and a landscape strategy will be implemented.	Positive *Not Significant*
Land, Soils and Geology; and Water and Hydrology	Population & Health	A negligible to small adverse impact on the hydrogeological environment, provided the mitigation measures outlined in the report are implemented. This will ensure that the predicted impact is long-term in duration and not significant in quality.	Neutral *Not Significant*
Land, Soils and Geology; and Landscape and Visual	Population	Long-term positive impact on the landscape which would be Significant in effect.	Positive *Significant*
Land, Soils and Geology	Air Quality & Climate	During the construction phase, dust emissions may potentially arise from soil erosion. The mitigation measures outlined, ensure that soil erosion and, indirectly, dust emissions are minimised.	Neutral *Not Significant*
Land, Soils and Geology	Population & Human Health	Dust emissions during construction can potentially impact on human health. The potential for impact on ambient air quality and effects on human beings/health, arising indirectly from soil erosion and resulting dust emissions during the construction phase of development, has been considered in Chapter 9.0 of this document. Mitigation measures will ensure that any potential impact is minimized.	Neutral *Not Significant*
Land, Soils, Geology & Hydrogeology	Biodiversity	Dust emissions during construction can cause temporary smothering of vegetation. The potential for effects on biodiversity, arising indirectly from soil erosion and resulting dust emissions during the construction phase of development, has been considered in Chapters 5.0 and 9.0 of this document.	Neutral *Not Significant*
Water and Hydrology	Biodiversity	Reduced water quality can cause effects on aquatic ecological receptors. Water quality will not deteriorate as a result of the proposed development either during the construction or long-term operational phases due to the inherent design and mitigation measures proposed during site development and construction.	Neutral *Not Significant*
Water Supply	Human Beings	Temporary disruption of potable water supply to existing users during connection works for the proposed development has been considered. Pressure on water supply due to additional users in the long term has also been addressed. Mitigation measures to reduce water usage have been designed into the proposed development.	Neutral *Not Significant*
Foul Water	Land, Soils, and Geology	Foul drainage infrastructure has the potential to interact with soils and groundwater in terms of potential leakage to these media. Drainage will be designed in accordance with the requirements of the	Neutral *Not Significant*

		Building Regulations and relevant IW Codes of Practice.	
Air Quality & Climate	Population & Human Health	Poor air quality can affect human health. Potential adverse effects are not anticipated during either the site development or long term operational phase, provided preventative mitigation measures during site development and construction phases are implemented. No long term effects on human health via impact on air quality are anticipated.	Neutral *Not Significant*
Air Quality & Climate	Material Assets – Property/Amenity	Dust deposition during construction can have potentially temporary adverse effects on property and amenity. Mitigation measures outlined for the site development and construction phases will ensure that nuisance dust is avoided and minimised throughout the duration of the development works.	Neutral *Not Significant*
Air Quality & Climate	Biodiversity	Air quality impacts can affect ecological receptors. Mitigation measures proposed will ensure that the effects are not significant.	Neutral *Not Significant*
Noise & Vibration	Health	Construction noise and vibration sources can temporarily potentially impact on human beings in terms of noise disturbance. However, a detailed CEMP incorporating mitigation measures will ensure that any potential effects are not significant. No long term effects are anticipated as the proposed Development is similar to existing development in the area.	Neutral *Not Significant*
Noise & Vibration	Biodiversity	Construction noise has the potential to impact on fauna in terms of temporary disturbance.	Neutral *Not Significant*
Traffic/ Transportation /Roads	Noise	Increased traffic flows can give rise to traffic related noise and effects on human beings. The impact of traffic related noise on the existing ambient sound environment is expected to be imperceptible with no effect anticipated on local residents.	Neutral *Not Significant*
Traffic/ Transportation /Roads	Air Quality & Climate	Increased traffic flows can give rise to traffic related air quality impacts and effects on human beings. The impact on ambient air quality levels is expected to be imperceptible with no effect anticipated on local residents. In terms of climate change, the proposed Development has been designed to encourage cycling and walking by providing routes and infrastructure. A Mobility Management Plan will be implemented.	Neutral *Not Significant*
Traffic/ Transportation /Roads	Human Beings - Safety	Increased traffic can potentially give rise to safety issues. A road safety audit has been carried out on the proposed development and recommendations have been incorporated into the proposed design where necessary.	Neutral *Not Significant*
Material Assets – Services	Human Health	A risk to the human health of the installer from built services can occur as a result of any excavation work in areas where built services exist, through coming	Neutral *Not Significant*

Infrastructure		into contact with live electricity lines or damaging live gas mains. Health and safety of workers will fall under the remit of the contractors appointed who will be required to comply with relevant Health and Safety legislation. From the perspective of the end user of the networks the risks to human health include: • Gas leaks or explosions. The installation of services is tightly monitored and controlled by Gas Networks Ireland to ensure the protection of human health. Therefore, the risk of effect on human health is not considered significant. • Loss of supply. This is a managed process that is the responsibility of the individual utility supplier and emergency plans will be in place. The effect is therefore considered brief and not significant. With the implementation of the aforementioned mitigation measures, the impact of the proposed built services on human health is likely to be negligible.	
Wind and Micro-Climate	Human Health	Results of wind microclimate (Distress Criteria) has shown this interaction to be not significant based on wind conditions prevalent in Dublin and considering the mitigation measures implemented during the design process.	Neutral *Not Significant*

Table 14.2 Summary Table of Principal Interactions between topics addressed by this EIAR.

14.4 Cumulative Impacts

The cumulate effects with other existing and/or approved projects in the area have also been considered to determine whether these could be sufficient to generate impacts of significance on the environment. Any predicted specific cumulative impacts are outlined in the various EIAR chapters, and tend to be temporary; related to the construction period; and manageable by way of mitigation. No significant interactions are envisaged in terms of interactions arising from cumulative impacts.

14.5 'Do Nothing' Scenario

If the proposed project does not proceed, there will be no cumulative impacts arising.

14.6 Mitigation and Monitoring Measures

It is not proposed that any mitigation or monitoring will be undertaken specifically for cumulative impacts.

15.0 EIAR MITIGATION AND MONITORING MEASURES

15.1 Introduction

This section of the EIAR has been prepared by Hughes Planning and Development Consultants in association with the various EIAR consultants. More specifically, this chapter of the EIAR was prepared jointly by Mr. Kevin Hughes, Director, and Ms. Margaret Commane, Associate, with Hughes Planning and Development Consultants.

Mr. Kevin Hughes of Hughes Planning and Development Consultants, graduated from University College Dublin (UCD) with a Masters in Regional and Urban Planning (MRUP) in 2002, having previously completed a Bachelor of Arts Degree in Sociology from National University of Ireland in 1999. Kevin has over 18 years professional experience in the field of planning and development consultancy, which has included providing consultancy services in respect of several major urban regeneration projects including EIA. Kevin is currently the Director of Hughes Planning and Development Consultants.

Ms. Margaret Commane of Hughes Planning and Development Consultants, graduated from University College Cork (UCC) with a Masters in Planning and Sustainable Development (MPLAN) in 2012, having previously completed a Bachelor of Arts Degree in Geography and Legal Science from National University of Ireland in 2010. Margaret has over 7 years professional experience in the field of planning and development consultancy, which has included providing consultancy services in respect of several major urban regeneration projects including EIA. Margaret is currently an Associate in the Practice of Hughes Planning and Development Consultants.

The central purpose of EIA is to identify potentially significant adverse impacts at the pre-consent stage and to propose measures to mitigate or ameliorate such impacts. This chapter of the EIAR document sets out a summary, for ease of reference, of the measures outlined within the individual chapters of this EIAR document which are proposed as mitigation and for monitoring during the construction and operational phases of the proposed development. All measures included below form part of the proposed development and will be implemented in full.

It is intended that this chapter of the EIAR document will provide a useful and convenient summary to the competent/consent authority of the range of mitigation and monitoring measures proposed.

15.2 Mitigation and Monitoring Measures

The following provides a list, for ease of reference, of the mitigation and monitoring measures recommended in each chapter of the EIAR.

15.2.1 Population and Human Health

Construction Phase

All standard health and safety procedures will be implemented at every stage of this project. The Main Contractor for the project is responsible for the method in which the demolition and construction works are carried out and to ensure that best practices and all legal obligations including Local Authority requirements and Health and Safety legislation are complied with. Further to this, Building Regulations will also be adhered to during the construction phase.

A range of construction related remedial and mitigation measures are proposed throughout this EIAR document with reference to the various environmental topics discussed under each. These measures seek to ensure that any likely significant adverse environmental impact on humans during the construction phases are either ameliorated to have an acceptable level of impact or avoided altogether. Included in these measures is the requirement that a detailed construction traffic management plan be prepared by the Contractor and agreed with South Dublin County Council as the Road Authority prior to commencing works on the public road. This Construction Traffic Management Plan will include restrictions on deliveries and access to the construction site. Further, measures with regards to noise and dust abatement covered elsewhere within this EIAR will be implemented during construction and will limit impacts on population and human health.

Further to the above, working hours on site will be as such that the residential amenity of adjacent residences is not unreasonably impacted upon. They will be agreed with the Council in full as part of the required construction management plan.

As a result of the implementation of the abovementioned measures, the impacts of the construction phase of the development on population and human health are not anticipated to be significant. Furthermore, all impacts will be temporary in nature.

Operational Phase

The mitigation measures relating to the operation phase of the development concerning traffic, transport, noise, vibration, water, air and dust quality and landscaping as set out in this EIAR (and listed in Chapter 15.0) will be carried out in full to minimise impacts on residents of the development, adjacent residents and human health.

Monitoring

There is no other ongoing monitoring required in relation to the effect of the proposed development on the population and human health.

15.2.2 Biodiversity

Demolition and Construction Phase

Standard construction and operational controls will be incorporated into the proposed development project to minimise the potential negative impacts on the ecology within the ZOI. These measures are outlined below in sequence and are designed to incorporate elements outlined elsewhere in this EIAR. A Demolition & Construction Phase Surface Water Management Plan will be implemented.

Designated Conservation sites

There is no direct pathway to conservation sites. However, there is an indirect pathway to the Ringsend WWTP. During construction standard construction phase controls will be in place to remove silt and petrochemicals prior to discharge of surface water to the existing combined sewer which discharges to Ringsend WWTP. Additional treatment will take place in Ringsend WWTP. No additional controls are required besides those outlined below, during the construction and operational phases of the development, to mitigate against potential negative impacts on designated conservation sites. The mitigation has been designed to ensure that the project will comply with the Water Pollution Acts in relation to construction and drainage. All measures outlined below will be followed.

Development Construction

- Relevant guidelines and legislation (Section 40 of the Wildlife Acts, 1976 to 2012) in relation to the removal of trees and timing of nesting birds will need be followed e.g. do not remove trees or shrubs during the nesting season (1st March to 31st August). Pre construction monitoring should be carried out for nesting herring gulls and relevant guidance followed including consultation with NPWS if nesting Herring gulls are found on site.
- Construction operations outside of daylight hours should be kept to a minimum in order to minimise disturbance to fauna in addition to roosting bird species.
- Native species should be chosen in all landscaping schemes. Planting schemes should attempt to link in with existing wildlife corridors (hedgerows and treelines), both onsite and off, to provide continuity of wildlife corridors.

- Staging of project to reduce risks to drainage networks from contamination.
- All water leaving the site during construction will be desilted using standard techniques including silt buster/silt socks etc.
- During demolition and enabling works all surface water from site will go to foul following desilting. All surface/pumped water will go to foul until the surface water infrastructure is complete, flow controls installed and inspected.
- Desilting and petrochemical interception of all surface runoff/pumped water will take place for the length of the construction project.
- A petrochemical interceptor will be placed on the surface water network prior to discharge.
- Local silt traps established throughout site.
- Mitigation measures on site include dust control, stockpiling away from watercourse and drains
- Stockpiling of loose materials will be a minimum of 20m from drains.
- Stockpiles and runoff areas following clearance will have suitable silt barriers to prevent runoff of fines into the drainage system.
- Fuel, oil and chemical storage will be sited within a bunded area. The bund will be at least 50m away from drains, excavations and other locations where it may cause pollution.
- Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. Any water-filled excavations, including the attenuation tank during construction, that require pumping will not directly discharge to the surface water network. Prior to discharge of water from excavations adequate filtration and petrochemical interception will be provided to ensure no deterioration of water quality and ensure compliance with the Water Pollution Acts.
- Site layout during excavation works will be designed to ensure vehicles do not enter the works area unless necessary for the excavation and soil removal processes. All machinery leaving the works area will be thoroughly cleaned before being allowed on to public roads. A road sweeper (including vacuum) will be in place (as required) to unsure cleanliness of nearby and haul roads (where necessary), particularly during enabling works.
- Dust may deposit on surrounding roads thus entering into the surface water network. Effective site management regarding dust emissions will be carried out.
- Plant refuelling activities. Oil/diesel spillages and risk of ground and surface water contamination. All mobile plant to be refuelled in a central refuelling area in a compound where a spillage containment sump will be constructed within the refuelling area. All collected fuel will be disposed offsite under license. A record of all spillages will be kept and monitored.
- Herring gulls were noted on site and as a precaution it is advised that mitigation is in place in relation to this species.
- Lighting during construction should not spill outside the proposed development.
- The effectiveness of the proposed mitigation should be monitored throughout the construction period.

Operational Phase

No significant effects are predicted for the operational phase thus mitigation measures are not proposed.

Monitoring

In relation to silt and petrochemicals, monitoring of surface water being filters prior to discharge to combined sewer is required during construction phase only.

In relation to nesting birds, pre-construction monitoring for Herring Gulls prior to demolition is required in compliance with Section 40 of the Wildlife Acts, 1976 to 2012.

15.2.3 Land, Soils and Geology

Construction Phase

In order to reduce impacts on the soils, geology and hydrogeology in the area, 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 and rock excavation and export from site;
- Sources of fill and aggregates for the proposed development;
- Fuel and chemical handling, transport and storage; and
- Control of water during construction.

Construction Management Plan

In advance of work starting on site the Contractor will prepare a Construction Management Plan (CMP). The CMP will set out the overarching vision of how the construction of the proposed development will be managed in a safe and organised manner by the Contractor as per client requirements. The CMP will be a live document and will set out requirements and standards which must be met during the construction stage. It will also include the relevant mitigation measures outlined in the EIAR and any subsequent conditions relevant to the proposed development.

Control of Soil Excavation

Subsoil and, potentially, bedrock will be excavated to facilitate the construction of the proposed development which will incorporate the reduce, reuse and recycle approach. The construction will be carefully planned to ensure only material required to be excavated will be, with as much material left in situ as possible. Excavation arisings will be reused on site where possible, however, it is envisioned that approx. 4,500 m3 will be exported from site.

It is unlikely any contaminated material will be encountered during construction of the proposed development. Nevertheless, any excavation works will be carefully monitored by a suitably qualified person to ensure any potentially contaminated soil is identified and segregated from clean/inert soil. In the unlikely event that any potentially contaminated soils are encountered, they should be tested and classified as hazardous or non-hazardous in accordance with the *EPA Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* publication, the HazWaste Online tool or a similar approved method. The material will then need to be classified as inert, non-hazardous, stable non-reactive hazardous or hazardous in accordance with EC Decision 2003/33/EC. It should then be removed from site by a suitably permitted waste contractor to an authorised waste facility.

Stockpiles have the potential to cause negative impacts on air and water quality by the production of dust (air quality) and silt sediments (water quality). The effects of soil stripping and stockpiling will be mitigated against through the implementation of an appropriate earthworks handling protocol during construction. Any stockpiles shall be formed within the boundary of the site and there shall be no direct link or pathway from this area to any surface water body and silt traps shall be installed, where appropriate.

Dust suppression measures (e.g. damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment are free of nuisance dust and dirt on roads.

Export of Material from Site

It is envisioned that some of the soil/rock arising on the site will be re-used on site. The remaining excavated material will be removed off-site either as a waste or, where appropriate, as a by-product. Where the material is to be reused on another site as a by-product (and not as a waste), this will be done in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011. EPA agreement will be obtained before re-using the spoil as a by-product. Where material cannot be reused off site it will be sent for recovery or disposal at an appropriately licensed facility.

If any waste soil requires removal from site, it should be classified by an experienced and qualified environmental professional to ensure that the waste soil is correctly classified for transportation and recovery/disposal offsite.

Sources of Fill and Aggregates

All fill and aggregate for the Proposed Development will be sourced from reputable suppliers. All suppliers will be vetted for:

- Aggregate compliance certificates/declarations of conformity for the classes of material specified for the Proposed Development.
- Environmental Management status; and
- Regulatory and Legal Compliance status of the Company.

It is anticipated that approximately 4,500 m3 engineered fill will be required to facilitate construction.

Fuel and Chemical Handling

The following mitigation measures will be taken at the construction stage to prevent any spillages to ground of fuels and prevent any resulting soil and/or groundwater quality impacts:

- Designation of a bunded refuelling areas on the site;
- Provision of spill kit facilities across the site;
- Where mobile fuel bowsers are used the following measures will be taken:
    - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
    - The pump or valve will be fitted with a lock and will be secured when not in use;
    - All bowsers to carry a spill kit
    - Operatives must have spill response training; and
    - Drip trays used on any required mobile fuel units.

In the case of drummed fuel or other potentially polluting substances which may be used during construction the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;
- 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 will be 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 CMP.

Control of Water during Construction

The Contractor shall ensure that a surface water drainage regime is implemented during the construction works. This can be carried out by constructing cut-off ditches and interceptor drains connected to a suitable and authorised discharge point.

All run-off shall be prevented from directly entering into any water course/ drainage ditches.

Should any discharge of construction water be required a licence will be acquired from the appropriate licencing authority. Pre-treatment and silt reduction measures on site will include a combination of silt fencing, settlement measures (silt traps, silt sacks and settlement tanks/ponds) 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 needed.

Operational Phase

There will be no bulk storage of fuel required for the operation of the proposed residential development. A considerable area of the site will be covered in hardstanding. The impermeable surface will minimise the potential influx of any contaminants from cars/trucks into soils and underlying groundwater.

Any accidental leaks from cars within the car parking/road areas will be directed through the surface drainage system via an appropriately sized interceptor.

The proposed surface water network for the proposed development has been designed as four separate catchments, one for each block. Each of the proposed catchments with be attenuated in separate infiltration detention facilities before discharge. The individual attenuation requirement for each of the proposed surface water catchments has been separately assessed. The discharge rates for these catchments will be controlled by a flow control device (hydro brake) and the appropriately sized attenuation facility.

Foul and surface water systems for the site will be separate and are designed in accordance with the requirements of South Dublin County Council, the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS), the Building Regulations and the recommendations of the DOE Recommendations for Site development works for Housing areas. In addition, surface water has been designed with reference to the 'The Planning System and Flood Risk Management Guidelines', the Greater Dublin Regional Code of Practice for drainage works and Irish Water Standards Details for water and wastewater.

Monitoring

During the construction phase, regular inspection of surface water run-off controls measures and cut-off/interceptor ditches shall be carried out throughout the construction phase. Regular inspection of construction mitigation measures will be undertaken e.g. concrete pouring, refuelling etc. as part of implementation of the site CMP.

*During the operational phase, n*o future soil or groundwater monitoring is proposed as part of the proposed development. Petrol interceptor(s) shall be maintained and cleaned out in accordance with the manufacturer's instructions. Maintenance of the surface water drainage system and foul sewers as per normal urban developments is recommended to minimise any accidental discharges to ground.

15.2.4 Water and Hydrology

Construction Phase

The following remedial and reductive measures will be implemented at construction phase:

- Surface water runoff during the construction phase may contain increased silt levels (e.g. runoff across areas stripped of topsoil) or become polluted by construction activities.
- A site specific Construction and Environment Management Plan will be developed and implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the Construction and Environment Management Plan.
- Rain water pumped from excavations is to be directed to on-site settlement ponds.

- Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
- Weather conditions and seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.
- In order to mitigate against spillages contaminating the surrounding surface water and hydrogeological environments, all oils, fuels, paints and other chemicals shall be stored in a secure bunded hardstand area. Refueling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (where not possible to carry out such activities off site).
- Concrete batching will take place off site and wash down and wash out of concrete trucks will take place off site.
- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
- Groundwater pumped from excavations is to be directed to on-site settlement ponds.

Operational Phase

The design of proposed site levels (roads, FFL etc.) has been carried out in such a way as to replicate existing surface contours, break lines etc., therefore replicating existing overland flow paths, and not concentrating additional surface water flow in a particular location.

Surface water runoff from the site will be attenuated to the greenfield runoff rate as outlined in the Greater Dublin Strategic Drainage Study (GDSDS). Surface water discharge rates will be controlled by a Hydrobrake type vortex control device in conjunction with attenuation storage.

The following methodologies are being implemented as part of a SuDS surface water treatment train approach:

- Extensive green roofs where applicable.
- Attenuation of the 30 and 100-year return period storms.
- Installation of a Hydrobrake (limiting surface water discharge from the site to greenfield runoff rates).
- Surface water discharge will also pass via a Class 1 fuel / oil separator (sized in accordance with permitted discharge from the site).

Monitoring

Proposed monitoring during the construction phase in relation to the water and hydrological environment are as follows:

- Adherence to Outline Construction Management Plan.
- Inspection of fuel / oil storage areas.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and vehicle wheel wash facilities.
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.)
- Monitoring of discharge from sediment retention ponds (e.g. pH, sediment content)

During the operational phase an inspection and maintenance contract is to be implemented in relation to the proposed Class 1 fuel / oil separators.

15.2.5 Noise and Vibration

Construction Phase

The assessment of construction phase impacts has found that significant noise and vibration impacts are not expected. Notwithstanding this, best practice noise and vibration control measures will be employed by the contractor during the construction phase in order to avoid significant impacts at the nearest sensitive buildings. The best practice measures set out in BS 5228 (2009 +A1 2014) Parts 1 and 2 will be adopted. This includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- Selection of quiet plant;
- Noise control at source;
- Screening; and
- Liaison with the public.

Operational Phase

Building Services Plant

Taking into account that sensitive receivers within the development are much closer than off-site sensitive receivers, once the relevant noise criteria included in Section 8.7 is achieved, it is expected that there will be no negative impact at sensitive receivers off site, and therefore no further mitigation required.

Inward Noise Impact

Furthermore, as is the case in most buildings, the glazed elements and ventilation paths of the building envelope are typically the weakest element from a sound insulation perspective. In general, all wall constructions (i.e. block work or concrete and spandrel elements) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal.

In this instance the facades highlighted in Figure 8.5 will be provided with glazing that achieves the minimum sound insulation performance as set out in Table 15.1 below (a reiteration of Table 8.12).

Typical Glazing Specification	Octave Band Centre Frequency (Hz)						R_w
	125	250	500	1k	2k	4k	
10/12/6.4	27	29	36	41	42	52	40

Table 15.1 Sound Insulation Performance Requirements for Glazing, SRI (dB)

The overall R_w outlined above are provided for information purposes only. The over-riding requirement is the Octave Band sound insulation performance values which may also be achieved using alternative glazing configurations. Any selected system will be required to provide the same level of sound insulation performance set out in Table 8.12 or greater.

It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing system. In the context of the acoustic performance specification the ‘glazing system’ is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc.

In addition, any background ventilators through the façade, e.g. trickle vents, will be selected to achieve an acoustic performance of at least 38dB $D_{ne,w}$ when in the open position for those facades identified in Figure 8.5.

With these measures in place the internal noise levels within those proposed buildings most exposed to environmental noise from Bóthar Katharine Tynan will achieve the criteria outlined in Table 8.5 when the windows are closed and the ventilators are open.

Monitoring

Construction Phase

The contractor will be required to ensure construction activities operate within the noise limits set out within this assessment. The contractor will be required to undertake regular noise monitoring at locations representative of the closest sensitive locations to ensure the relevant criteria are not exceeded.

Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise*.

Operational Phase

Noise or vibration monitoring is not required once the development is operational.

15.2.6 Air Quality and Climate

Construction Phase

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the Dust Management Plan. The key aspects of controlling dust are listed below. Full details of the Dust Management Plan can be found in Appendix 9.3. These measures will be incorporated into the overall Construction Management Plan (CMP) for the site. In summary the measures which will be implemented will include:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

Operational Phase

The impact of the proposed development on air quality and climate is predicted to be imperceptible with respect to the operational phase in the long term. Therefore, no site specific mitigation measures are required.

Monitoring

Due to the nature of the area and the absence of high sensitivity residential receptors in close proximity to the proposed development site, there is no monitoring recommended for the construction and operational phases of the development. The impact assessment concluded that impacts to air quality and climate are predicted to be imperceptible as a result of the proposed development.

15.2.7 Material Assets

15.2.7.1 Traffic/Transportation/Roads

Construction Phase

All existing roads infrastructure, and footpaths, which were designed to facilitate the historic operation of Cookstown Industrial Estate will be removed and replaced with modern high quality DMURS compliant roads, cycleways and footpaths that create an accessible residential street network within the boundary of the proposed development site. In addition, an improved direct pedestrian link to Belgard LUAS is proposed. Copious bicycle parking is provided, together with limited and managed car parking, as illustrated in Table 10.1 above, which shows the provision per residential block.

Operational Phase

Car parking is being provided significantly below the maximum standards as set out within the SDCC Development, with on average an approximate ratio of 0.3 per residential unit, including on-street provision. The lower provision of car parking will act as a demand management measure, ensuring that the development is accessed in the most sustainable manner, being almost predominantly reliant on non-car modes of travel. The lower provision of car parking is supported by a working Mobility Management Plan.

In terms of number of transport alternatives easily available to Residents, it is considered that the proposed development is very highly sustainable indeed, in terms of public and alternative transport accessibility. The proximity of the development to existing public transport services means that all residents will have viable alternatives to the private car for accessing the site and will not be reliant upon the car as a primary mode of travel.

Monitoring

No specific monitoring is proposed in relation to Traffic/Transportation/Roads.

15.2.7.2 Water Supply & Drainage

Construction Phase

A site-specific Construction and Waste Management Plan implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the Construction and Waste Management Plan.

Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.

The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be tinkered off site to a licensed facility until a connection to the public foul drainage network has been established.

The construction compound's potable water supply shall be located where it is protected from contamination by any construction activities or materials.

Connections to the existing gas and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.

Operational Phase

Refer to Chapter 7.0 - Water and Hydrology for mitigation measures associated with the surface water treatment.

All new foul drainage lines will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational.

No specific mitigation measures are proposed in relation to water supply, however water conservation measures such as dual flush below water cisterns and low flow taps will be included in the design.

Monitoring

Refer to Chapter 7.0 - Water and Hydrology for the proposed monitoring in relation to the surface water.

No specific monitoring is proposed in relation to the remaining material assets infrastructure.

15.2.8 Archaeology, Architectural and Cultural Heritage

Construction Phase

It is possible that disturbed or truncated archaeological features will have survived beneath the surface within the existing brownfield development, including beneath a strip of possibly undisturbed grass and vegetation within the northern segment.

While the probability of this development to impact archaeological features is low, it is recommended that a licensed archaeologist oversee the stripping of surfaces on this site following the demolition of upstanding structures. This will provide an opportunity to identify and record any potential surviving or truncated subsurface features which may include;

- The Cookstown / Tallaght townland boundary;
- The former course of the Old Belgard Road;
- Evidence of structures adjacent to the former Old Belgard Road;
- Other features such as field boundaries, archaeological features and deposits.

Operational Phase

No mitigation will be required during Operational Phase.

Monitoring

No post-development monitoring will be required as part of the proposed development.

15.2.9 Landscape and Visual Amenity

Construction Phase

During construction there will be a change to the landscape and there will be negative visual impacts for residents and visitors to the areas adjacent to the site associated with construction activity.

The remedial measures proposed revolve around the implementation of appropriate site management procedures – such as the control of site lighting, storage of materials, placement of compounds, delivery of materials, car parking, etc. Visual impact during the construction phase will be mitigated somewhat through appropriate site management measures and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that public areas are kept free from building material and site rubbish.

Site hoarding will be appropriately scaled, finished and maintained for the period of construction of each section of the works as appropriate. To reduce the potential negative impacts during the construction phase, good site management and housekeeping practices will be adhered to. The visual impact of the site compound and scaffolding visible during the construction phase are of a temporary nature only and therefore require no remedial action other than as stated above.

Existing trees adjacent to the site will be retained and protected in accordance with Arboricultural Recommendations. With regard to the protection of the retained trees on site during proposed construction works, reference should be made to BS5837: Trees in relation Design, Demolition and Construction – Recommendations (BSI, 2012).

Adverse impacts both during construction and at operation phases could be mitigated through undertaking tree planting along the north of the site as early on in the construction process as possible to soften and screen views from the north.

Operational Phase

The scheme design reflects the planning objectives for the area and in general a positive transformation from a declining poor quality industrial character to a positive and modern new residential area that is an extension of the growing Tallaght Town Centre. The development incorporates significant consideration and of design features to enhance the quality of amenity for new residents as well as to mitigate any potential adverse impacts on nearby existing residents. These include;

- The retention of the existing adjacent rows of trees.
- The construction of a large landscape earthwork to the north of the site to soften views from the north and capture views from the LUAS against the backdrop of high quality, contemporary apartment buildings.
- The careful placement buildings, trees, artwork and features to create features and focal points in the views available.
- The softening of the existing predominantly hard landscape with lawns, tree planting, vegetation and planted swales. A mix of planting types and habitats create a varied landscape structure throughout the scheme. The extensive planting of additional trees will reduce the visual mass of the buildings, soften and partially screen the development over time from various viewpoints, as identified in the assessment, thereby minimising the visual impacts.
- The inclusion landscape works, which are proposed to reduce and offset the minimal impacts generated due to the proposed development, where possible. The planting of substantial numbers of new trees and other planting in the open spaces and along internal roads will enhance the overall appearance of the new development and compensate for the removal of the hedgerow to the north of the site.
- The design of public open spaces as part of an overall design strategy that focuses on creating a ‘sense of place’ and individual character for the development area. The quality of the public realm scheme is of a high standard and the quality of materials proposed is similarly high and robust.

- The introduction of colour and texture into the urban landscape through the use of materials and planting.
- The planting of native and appropriate species for biodiversity has been incorporated into the scheme in accordance with the advice of the Project Ecologist.
- The application of best practice horticultural methods to ensure that mitigation measures establish and grow appropriately.
- The proposal of additional planting between the northern site boundary and Katherine Tynan road to mitigate habitat loss and create a softer transition between the residential areas north and south of Katherine Tynan Road.
- The design of public open space that forms part of a network of spaces that includes areas for passive and active recreation, social / community interaction and play facilities catering for all ages.
- The retrofitting of the surrounding roads infrastructure to suit the residential use of the development – removing high kerbs and installing cycle paths and planting trees in generous verges.

Monitoring

Construction Phase

Landscape tender drawings and specifications will be produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect.

The planting works will be undertaken in the next available planting season after completion of the main civil engineering and building work.

Operational Phase

This will consist of weed control, replacement planting, pruning etc. All landscape works will be in an establishment phase for the initial three years from planting. The company responsible for site management of the scheme will be responsible for the ongoing maintenance of the site after this three-year period is complete.

15.2.10 Wind and Microclimate

Construction Phase

The effects on wind microclimate at the Site during the construction phase have been assessed using professional judgement.

As construction of the Proposed Development progresses the wind conditions at the Site would gradually adjust to those of the completed development, and mitigation measures would need to be implemented before completion and operation.

Operational Phase

As stated above, if the wind conditions exceed the threshold, these conditions become unacceptable for favourable pedestrian activities and mitigation measure should be accounted for.

The mitigation measures utilized for this development is landscaping using tree plantings, which creates a reduced vorticity, making it possible to reduce incoming velocities, thus reducing wind impacts on the buildings, public spaces or pedestrian paths. Small particles randomly distributed within an area are normally used in numerical modelling to model trees, as shown in Figure 13.34. These introduce a pressure drop in the model and therefore causes the wind to reduce its speed when passing through the trees, as expected in reality. The CFD plot shown in Figure 13.34 demonstrate this effect.

Monitoring

There is no other ongoing monitoring required in relation to the effect of the proposed development in relation to wind and microclimate.