ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) WHITE PINES EAST SHD

FOR ASSESSMENT OF PROPOSED RESIDENTIAL DEVELOPMENT AT WHITE PINE EAST, STOCKING AVENUE, DUBLIN 16



PREPARED FOR:

ARDSTONE HOMES
48 Fitzwilliam Square
Dublin 2
D02 EF89

PREPARED BY:

TOM PHILLIPS + ASSOCIATES
80 Harcourt Street
Dublin 2
D02 F449

IN ASSOCIATION WITH:

VIRTUS PROJECT MANAGMENT
5th Floor,
The Glass House
11 Coke Lane
Dublin 7
D07 WNP2

March 2021

TABLE OF CONTENTS

Chapters

1 Introduction 1-1
2 Site Location and Context 2-1
3 Description of the proposed development 3-1
4 Examination of Alternatives 4-1
5 Archaeology, Architectural and Cultural Heritage 5-1
6 Population and Human Health 6-1
7 Biodiversity 7-1
8 Land and Soils 8-1
Appendix 8.1: Preliminary Ground Investigation Information
9 Landscape and Visual Impact Assessment 9-1
10 Hydrology including Flood Risk Assessment 10-1
Appendix 10.A: Flood Hazard Information;
Appendix 10.B: Correspondence with Irish Water
11 Air Quality and Climatic Factors 11-1
12 Noise and Vibration 12-1
13 Material Assets – Waste 13-1
Appendix 13.1: Construction & Demoltion Management Plan
Appendix *13.2:Operational Waste Management Plan*
14 Material Assets – Traffic and Transportation 14-1
15 Material Assets – Site Services 15-1
Appendix 15.1:Utility Record Drawings
16 Interactions and Cumulative Impacts 16-1
17 Mitigation Measures and Monitoring 17-1
18 Difficulties Encountered 18-1

Appendices

Appendix 1 Community Infrastructure Audit
Appendix 2 Childcare Facility Audit
Appendix 3 School Needs Assessment
Appendix 4 Sunlight, Daylight and Shadow Analysis
Appendix 5 Preliminary Construction Management Plan

1.0 INTRODUCTION

1.1 Outline Details

This Environmental Impact Assessment Report (EIAR) relates to a Planning Application by Ardstone Homes Ltd.[1] (Ardstone Capital Limited), with respect to the proposed residential development on a site of c.2.98 Ha at lands north of Stocking Avenue, Dublin 16. (see Figure 1.1).

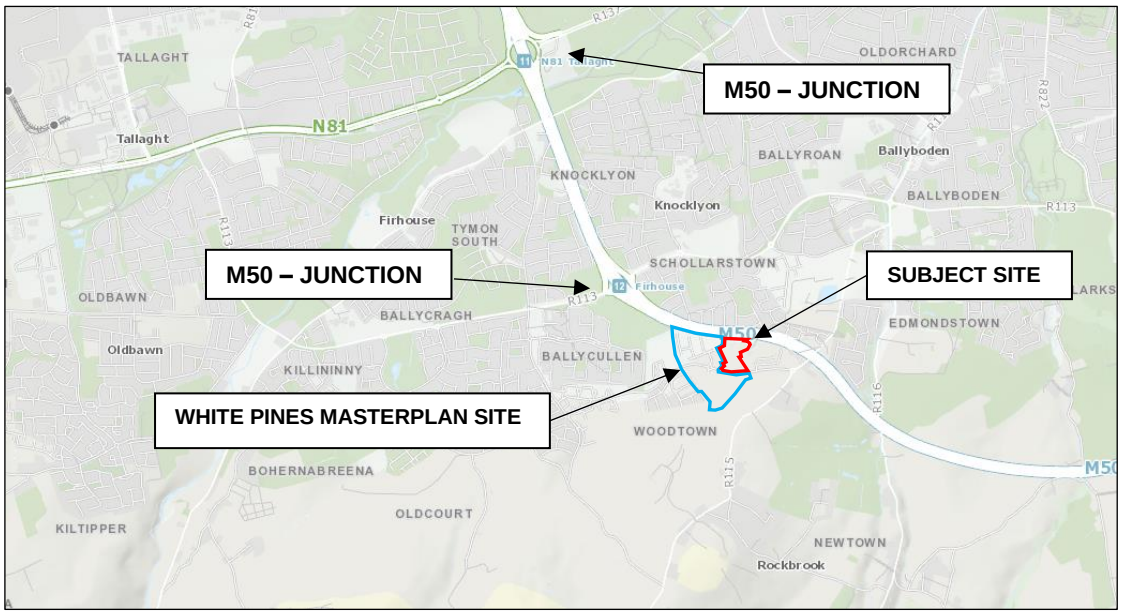


Figure 1.1: Urban Context Map (Source: www.geohive.ie; Annotated and Cropped by TPA, 2021).

The application site is principally bounded by;

- Stocking Avenue to the south;
- The White Pines North residential development to the west;
- The M50 to the north; and
- Stocking Hill residential development & Green Acres House to the east.

The site represents a greenfield site, zoned for residential use in the *South Dublin Development Plan (SDDP) 2016-22* and Ballycullen Oldcourt LAP (BOLAP), 2014 and will comprise the fourth element of the overall White Pines residential development (see Figure 1.2).

[1]No. 48 Fitzwilliam Square, Dublin 2, D02 EF89.



Figure 1.2: Site Location, Subject Site Outlined Red. [Source: Bing Maps: Cropped/Annotated by TPA]

The subject site at White Pines East forms part of a wider masterplan development, known as White Pines. The White Pines masterplan site comprises; White Pines Central, White Pines East, White Pines North, White Pines South and White Pines Retail.

Ardstone Homes Ltd. control the entire White Pines masterplan site and have already provided for some 281 no. three, four and five bedroomed family homes at White Pines North and White Pines South, on lands adjacent to the subject site. The subject application (White Pines East SDH) represents the fourth phase of the wider White Pines masterplan development.

Phase	Provided/Proposed	Status
1. White Pines North	175 no. 3-5 bed family homes	Complete and Occupied
2. White Pines South	106 no. 3-5 bed family homes	Complete and Occupied
3. White Pines Retail	A single storey convenience retail unit (c.1,479 sq.m. GFA) and a three storey creche building (c.577sq.m. GFA).	Construction Commenced August 2020
4. White Pines East SHD	241 units in a mix of 1 and 2 bed apartments.	Subject Application
5. White Pines Central SHD	137 no. 1-3 Bed apartments/duplex units.	Pre-application stage

Table 1.1: White Pines Masterplan Development

Reg. Ref.	Address	Decision	Description
Completed/Approved Ardstone Homes Ltd. Development			
South Dublin Reg. Ref. SD19A/0345, as amended SDCC Ref. SD20A/0322)	White Pines Retail	Granted 10.02.2021	Planning permission was granted permission for the construction of a neighbourhood centre comprising: a single storey convenience retail unit (c.1,688 sq.m. GFA) and a three storey creche building (c.591sq.m. GFA).
South Dublin Reg. Ref. SD19A/0099/ ABP Ref. PL06S.304670	White Pines South	Granted 26.09.2019	Retention permission was sought for works proposed to 65 no. houses. The overall development related to the construction of 99 no. houses permitted under Ref. SD17A/0359 on a site of c.2.29 ha at Stocking South.
South Dublin Reg. Ref. SD14A/0222, as amended SD14A/0222 SD17A/0359	White Pines North -	Granted 20.03.2015	Planning permission was granted for a 10-year permission for the construction of 175 no. residential units; 167 no. houses and 8 no. apartments.
Forthcoming Planning Applications			
ABP Ref. PL06S.307307	White Pines Central SHD	N/A	An SHD Pre-application submission was made to ABP in November 2020, by Ardstone Homes, comprising the development of 137 no. residential units, on a site opposite the subject site on Stocking Avenue, see Figure 1.2 above. A Pre-application tripartite SHD meeting is scheduled to be held with ABP and SDCC February 2021.

Table 1.2: Ardstone Development Sites surrounding White Pines East

Please refer to Section 3.0 of the Planning Statement, prepared TPA dated March 2021, for a comprehensive breakdown of the site's planning history and other relevant planning applications in the area.

There are no recorded monuments within a 500m radius of the application site. There two Protected Structures (recorded by the NIAH), a gate lodge (RPS No. 335) c. 250m to the south associated with Woodtown Park/Manor and the Ballyboden Waterworks (RPS. No. 333) c.500m to the northeast.

In summary, the proposed development will comprise the construction of 241 no. residential units, in a mix of 1 and 2 bed apartments in 5 no. blocks ranging in height from 4 - 6 no. storeys, 3 no. 3 storey duplex blocks located to the western boundary, and, c.171 sqm of internal residential amenity space. The development will also provide a 552 sqm community building space, located on the ground floor of Block A.

The proposed development will also include hard and soft landscaping, boundary treatments, public lighting, ESB substations, plant and switch rooms, and residential waste facilities, piped site wide services, and all ancillary works and services necessary to facilitate construction and operation. The development will be served by a vehicular access from Stocking Avenue on the southern side of the site. A secondary access point will also be provided, from White Pines North, to the north west of the site.

It is noted that all residential units are proposed for private sale.

A key informing objective of Ardstone Homes Ltd masterplanning for both their existing and planned residential developments at Stocking Avenue (see Table 1.2), including this current application at White Pines East, has been to ensure connectivity with adjoining residential areas. As such, it has been a key design aim of the current application to ensure adequate connectivity with White Pines North on western boundary of the subject site. The proposed site layout also allows for future connections to Green Acres House, on the eastern boundary of the site, should this site come forward for redevelopment in the future.

Furthermore, it is also noted that Ardstone Homes Ltd are currently progressing a separate SHD planning application for the provision of c.137 no. residential units at White Pines Central, located directly south of the application site. For the reasons detailed in Section 1.3 below, this EIAR will consider the proposed development in isolation and cumulatively with the existing and planned residential developments at the White Pines Masterplan site comprising; White Pines North, White Pines South, White Pines Central, White Pines Retail and the subject development at White Pines East.

1.2 EIA Process

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

EIA forms part of the planning consent process and is carried out by the Competent Authority. An EIAR is prepared by / on behalf of a Developer in respect of a project seeking planning consent. The EIAR thus becomes an integral informing element in the Competent Authority's EIA. The 2014 Directive has introduced strict new requirements in respect of the competency of experts responsible for the preparation of the EIAR (see Appendix 1A below for details on the experts involved in the preparation of this document).

The EIA process may be summarised as follows:

1. Screening – Is EIA Required?
2. Scoping – If EIA is Required, what aspects of the Environment should be considered?
3. Preparation of EIAR
4. EIAR informs EIA (as part of the consent process)

1.3 The Need for EIA

The proposed development has been screened for EIA in accordance with the *European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018*), in accordance with the EIA Directive.

Section 172(1) of the Acts sets out the requirement for EIA. Mandatory EIA is required for Projects listed in Part 1 of Schedule 5 of the *Planning and Development Regulations 2001-2020* ("*the Regulations*"), referred to as Annex I Projects, in accordance with the EIA Directive.

The Project is not listed within Part 1 of Schedule 5 of the Regulations and therefore mandatory EIA is not required in this instance.

With respect to Part 2 of Schedule 5 (Annex II Projects), the Project has been assessed against the following relevant criteria:

Class 10 – Infrastructure Projects

Subsection 10(b)(i):

"*Construction of more than 500 dwelling units*"

This Project comprises a mixed-use development comprising 241 no. residential dwellings in a mix of apartments and duplex units. This is below the threshold for an EIAR.

However, as noted above, Ardstone Homes Ltd are also progressing with a separate application for c. 137 no. residential units on a site immediately south of White Pines East, known as White Pines Central (see Figure 1.2). Furthermore, Ardstone Homes Ltd have also recently developed 175 no homes at White Pines North and 106 no. homes at White Pines South. When considered cumulatively, the total number of units being proposed and provided across the White Pines Masterplan Site, c. 659 no. residential units, is in excess of the threshold set out in Class 10 of Schedule 5, as noted above.

Although it is not strictly necessary to include homes that have already been completed within the above threshold, in the interest of comprehensively addressing any environmental concerns, and given the no. of homes recently delivered in the area by our client, it is considered appropriate to provide an EIAR to consider any potential impacts, in line with the provisions of the EIA Directive.

As noted above, Ardstone Homes Ltd. are also in progressing a separate SHD application on a site adjacent to the Subject site, White Pines Central. Given both SHD Applications (White Pines East and White Pines Central) are being submitted independently, a separate standalone EIAR will be provided with each planning application. Each EIAR will consider the impacts of their subject development and also the cumulative impacts of both developments in tandem.

1.4 Purpose of the Environmental Impact Assessment Report

As noted, the 2014 Directive has redefined EIA as a process, whereby an EIAR is a key informing element. An EIAR's purpose is to predict and assess likely significant effects (direct and indirect) on the environment arising from the proposed development. It is used during the consent process to inform EIA.

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

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

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

The preparation of the *Environmental Impact Assessment Report* has been co-ordinated by Tom Phillips + Associates, Town Planning Consultants[2], in association with other members of the Project Team as identified in Table 1.3 below. Details in respect of the competence of the various experts is set out in Appendix 1.1.

1.5 Scoping of the Environmental Impact Assessment

An informal EIA Scoping Report was undertaken by TPA, dated April 2020, with respect to the proposed development. The purpose of the EIA Scoping exercise was to inform consultees of the proposed development, having regard to the extent of information to be contained within the EIAR for the project.

The scope of the EIAR has been prepared in consultation with the respective specialists within the EIA team. The Report set out a detailed justification relating to the environmental aspects to be considered in detail in the EIAR for the proposed development on the basis of the potential for significant effects. The Report also related to the construction and operational phases of the proposed development.

The non-statutory scoping report was issued to a range of stakeholders / prescribed bodies as listed in Appendix 1.2.

All matters raised in the responses received from the stakeholders have been addressed within this EIAR and appropriate mitigation measures identified where necessary.

1.6 EIAR Format

In addition to the 2014 Directive, the subject EIAR has been informed by:

- *Draft Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports* (EPA, August 2017);
- *Advice Notes for Preparing Environmental Impact Statements,* Draft, (EPA September 2015);
- *Environmental Impact Assessment of Projects: Guidance on Screening* (European Commission, 2017);
- *Environmental Impact Assessment of Projects: Guidance on Scoping* (European Commission, 2017);
- *Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report* (European Commission, 2017);
- *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment,* (August 2018);

Environmental Impact Assessment Reports require the assimilation, co-ordination and presentation of a wide range of relevant information in order to allow for the overall assessment of a proposed development. To allow for ease of presentation, and consistency

[2] Tom Phillips + Associates, Town Planning Consultants, 80 Harcourt Street, Dublin 2, D02 F449

when considering the various environmental factors considered, a systematic structure is used for the main body of the Report.

The structure of the EIAR is outlined below. This structure is followed in each chapter so as to systematically identify, assess and where necessary mitigate the environmental impacts of the proposed development.

1.6.1 Receiving Environment (Baseline Situation)

This section provides a description of the current state of the environment related to the subject site, and a description of its likely evolution in the event that the Project is not implemented.

1.6.2 Characteristics of the Proposed Development

This section provides a description of the location, nature and extent of the project along with its construction and operational characteristics. The description includes estimates of any residues, emissions, or waste produced during the construction and operational stages.

1.6.3 Environmental Factors Affected

This section provides a list of the environmental factors likely to be impacted by the Project.

1.6.4 Likely Impact of the Proposed Development and Remedial and Mitigation Measures

This section allows for a description of the direct and indirect impacts that the proposed development is likely to have on aspects of the environment affected. This is done with reference to both the *Receiving Environment* and *Characteristics of the Proposed Development* sections, while also referring to the magnitude, duration, consequences (including use of natural resources) and significance of any impact.

1.6.5 Assessment of Alternatives

This part of the EIAR describes the reasonable alternatives considered and provides a rationale for the chosen Option.

1.6.6 Avoidance, Mitigation or Compensation Measures

This section provides a description of the measures envisaged to prevent, reduce and (where possible) offset any significant adverse effects on the environment that are practicable or reasonable, having regard to the potential impacts.

1.6.7 Monitoring

This section outlines monitoring measures (for both construction and operational stages), where appropriate, in cases where significant adverse impacts have been identified.

1.6.8 Non-Technical Summary

As per the requirements of the Directive, a separate Non-Technical Summary (NTS) comprises an easily accessible summary of the EIAR, using non-technical language. It is formulated to be

understandable to those without a prior background to the project or particular environmental expertise.

1.6.9 EIAR Study Team and Guarantee of Competency and Independence

The Environmental Impact Assessment Report was completed by a project team led by Tom Phillips + Associates, who also prepared a number of the chapters.

In accordance with EIA Directive 2014/52/EU, we confirm that the experts involved in the preparation of this EIAR are fully qualified and competent in their respective fields. Each has extensive proven expertise in the relevant field concerned, thus ensuring that the information provided herein is complete and of high quality. The individual members of the team and their respective inputs and competency are detailed in Appendix 1A. Table 1.3 below provides an overview of the various consultancies who prepared the relevant chapters.

Chapter	Aspects of the Environment Considered	Contributor
Chapter 1	Introduction	TPA
Chapter 2	Site Location and Context	TPA
Chapter 3	Description of the Proposed Development	TPA
Chapter 4	Examination of Alternatives	TPA
Chapter 5	Archaeology, Architectural and Cultural Heritage	Irish Archaeological Company
Chapter 6	Population and Human Health	AWN Consulting
Chapter 7	Biodiversity	Altemar Marine and Environmental Consultants
Chapter 8	Land and Soils (Geology and Hydrogeology)	DBFL Consulting Engineers
Chapter 9	Landscape and Visual Impact	Mitchell & Associates
Chapter 10	Hydrology including Flood Risk Assessment	DBFL Consulting Engineers
Chapter 11	Air and Climate	AWN Consulting
Chapter 12	Noise and Vibration	AWN Consulting
Chapter 13	Material Assets – Waste	AWN Consulting
Chapter 14	Material Assets – Traffic and Transportation	DBFL Consulting Engineers
Chapter 15	Material Assets – Site Services	DBFL Consulting Engineers
Chapter 16	Interactions and Cumulative Impacts	TPA
Chapter 17	Mitigation and Monitoring	TPA
Chapter 18	Difficulties Encountered	TPA

Chapter	Aspects of the Environment Considered	Contributor
NTS	Non – Technical Summary	TPA

Table 1.3: EIAR Chapter Headings and Contributors

1.7 The Developer

The development is proposed by the owners of the site, Ardstone Homes Ltd. The registered office of which is 48 Fitzwilliam Square, Dublin 2, D02 EF89.

APPENDIX 1A: COMPETENCIES OF EIAR CONTRIBUTORS

1.A1 EIAR Team - Roles and Responsibilities Including Qualifications

Role	Company Name	Person Responsible
Project Management, Planning Consultant	TPA, Town Planning Consultants	David Lee
Engineering Design	DBFL	Brendan Keogh
Architectural Design	John Fleming Architects	John Fleming /Oscar Carballal

EIAR Chapter No.	Chapter Title	Company Name	Responsible
Chapter 1	Introduction	TPA - Town Planning Consultants	David Lee / Laura Finn
Chapter 2	Site Location and Context	TPA - Town Planning Consultants	David Lee / Laura Finn
Chapter 3	Description of the Proposed Development	TPA - Town Planning Consultants	David Lee / Laura Finn
Chapter 4	Examination of Alternatives	TPA - Town Planning Consultants	David Lee / Laura Finn
Chapter 5	Archaeology, Architectural and Cultural Heritage	Irish Archaeological Consultancy	Grace Corbett
Chapter 6	Population and Human Health	AWN Consulting Ltd	Paul Conaghan
Chapter 7	Biodiversity	Altemar Environmental Consultants	Bryan Deegan
Chapter 8	Land and Soils (Geology and Hydrogeology)	DBFL Consulting Engineers Limited	Brendan Keogh
Chapter 9	Landscape and Visual Impact Assessment	Mitchell + Associates	Dave Kirkwood
Chapter 10	Hydrology including Flood Risk Assessment	DBFL Consulting Engineers Limited	Brendan Keogh
Chapter 11	Air Quality and Climatic Factors	AWN Consulting Ltd	Jack Brennan
Chapter 12	Noise and Vibration	AWN Consulting Ltd	Alistair Maclaurin
Chapter 13	Material Assets – Waste	AWN Consulting Ltd	Chonaill Bradley
Chapter 14	Material Assets – Traffic and Transportation	DBFL Consulting Engineers Limited	Brendan Keogh
Chapter 15	Material Assets – Site Services	DBFL Consulting Engineers Limited	Brendan Keogh
Chapter 16	Interactions and Cumulative Impacts	TPA - Town Planning Consultants	David Lee / Laura Finn

EIAR Chapter No.	Chapter Title	Company Name	Responsible
Chapter 17	Mitigation Measures and Monitoring	TPA - Town Planning Consultants	David Lee / Laura Finn
Chapter 18	Difficulties Encountered	TPA - Town Planning Consultants	David Lee / Laura Finn

1.A2 EIAR Team Qualifications + Affiliations

Laura Finn, (*TPA Town Planning Consultants)*
Qualifications: BA (Hons)T&CP, Dip ERM, Dip EIA Mgmt, MIPI

David Lee, (*TPA Town Planning Consultants)*
Qualifications: BA, MRUP, MIPI, MRTPI

Grace Corbett *(AWN)*
Qualifications: MA, MCIfA, MIAI

Bryan Deegan (Altemar)
Qualifications: MCIEEM, MSc, BSc, NDip, NCert

Brendan Keogh – Associate Director, Civils
BA, BAI, PGradDip, CEng, MIEI

Mark Kelly – Senior Traffic Engineer
BA, BAI (Hons), MSc, CEng MIEI

Dave Kirkwood (MA)
Qualifications: BSc(Hons), Dip. Env. Man, CMLI, MILI

Jack Brennan (AWN)
Qualifications: BSc in Environmental Management from Technology University Dublin.

Paul Conaghan *(AWN)*
Qualifications: Bsc. Environmental Science; Msc. Environmental Engineering

Alistair Maclaurin *(AWN)*
Qualifications: BSc PgDip MIOA

Chonaill Bradley *(AWN)*
Qualifications: BSc, GradCIWM

Dónal O'Connor (OCSC)
Qualifications: MSc. Sustainable Energy

2.0 SITE LOCATION AND CONTEXT

2.1 Location of the Subject Site

The subject site, White Pines East, is located in south west Dublin, in the administrative district of South Dublin Council. The site comprises a c.2.98Ha greenfield site, zoned for 'new residential' in the *South Dublin Development Plan 2016-22*.

The subject site is located approximately 1.5km to the south-east of Woodstown village centre. The site is accessed from Stocking Avenue, which is a distributor route to the new residential areas south of Woodstown Village.

The site's topography is sloped rising from the site's northern boundary with the M50 to the proposed entrance at Stocking Lane, with the highest point being the south east corner of the site.

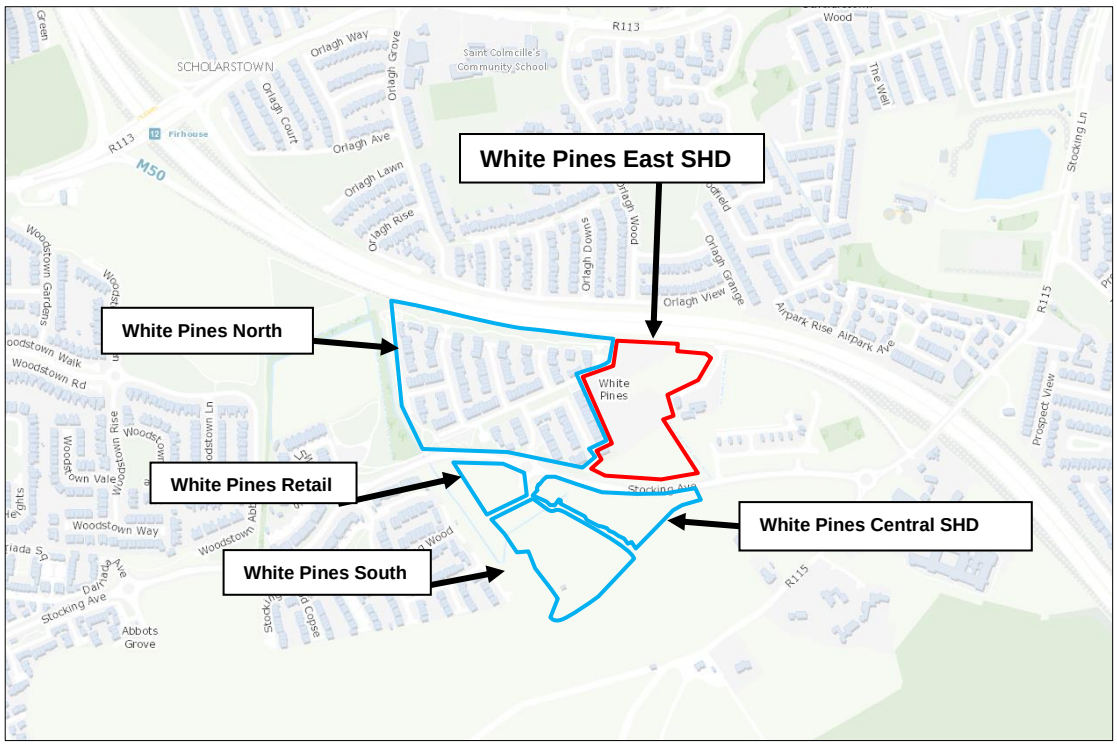


Figure 2.1: Location of Subject Site (Source: Bing Maps; annotated by TPA, 2021).

The site is located within an area characterised primarily by new residential developments. The site is principally bounded by the White Pines North residential scheme to the west; Stocking Avenue to the south; Stocking Hill residential development and Green Acres House and to the east; and the M50 to the north.

As shown in Figure 2.2 below, the surrounding area is characterised by a mix of residential and outdoor amenity spaces.

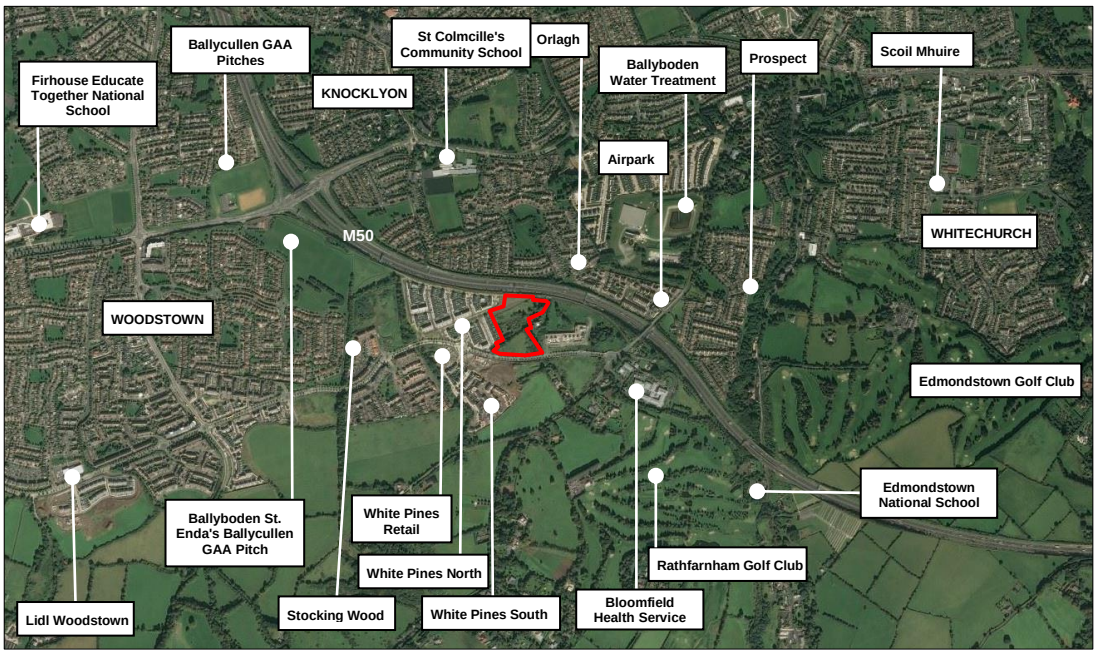


Figure 2.2: Surrounding context [source, Bingmaps, cropped and annotated by TPA 2021]

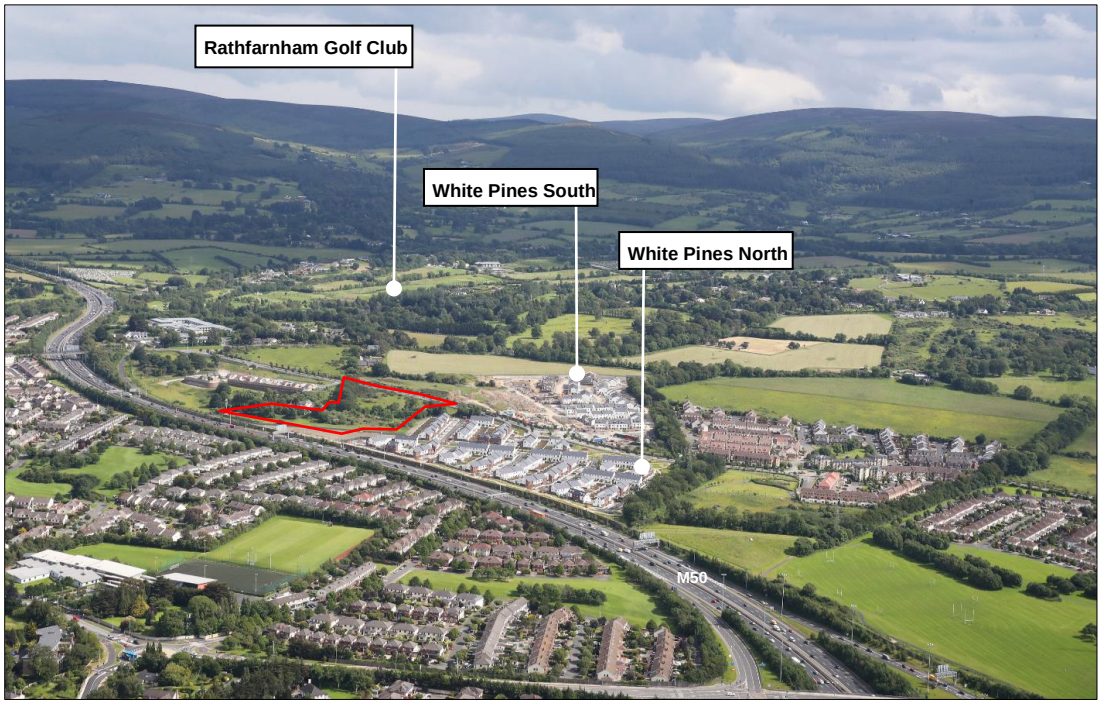


Plate 2.1: Ariel View of Site, Looking South (Site Boundary Outlined Red)

Southern Site Boundary

The site is bound to the south by Stocking Avenue. As shown in Figure 2.2, the site is surrounded by a number of existing residential areas and a number of vacant sites, zoned for new residential with extant planning permissions (see Table 3.2 for further information).

South of the subject site, another residential development of 106 homes (White Pines South), which completed construction in 2020 and is currently being occupied. White Pines Central

and White Pines Retail are two further undeveloped sites which lie directly south of Stocking Avenue (see Figure 1.2).

White Pines Retail (SDCC Ref. SD19A/0345) was granted planning permission in February 2020 for the construction of a neighbourhood centre comprising: a single storey convenience retail unit (c.1,688 sq.m. GFA) and a three storey creche building (c.591sq.m. GFA). The White Pines Retail site commenced construction in 2020. Completion is scheduled for Q3 2021, with immediate occupation by National Retailer. Please refer to Table 3.2 of this EIAR for a breakdown of surrounding development sites.

As noted above, Ardstone Homes Ltd are in the process of delivering a separate standalone SHD planning applicaition for the construction of c.137 residential units on a site of c2.2 Ha, directly south of the subject site, known as White Pines Central SHD. This development will be subject to a separate standalone SHD planning application to An Bord Pleanála and will be supported by a separate EIAR.



Plate 2.2: View of southern site boundary, looking east. Source: TPA, 2021



Plate 2.3: View of southern site boundary, looking west, Source: TPA, 2021

Western Site Boundary

The site is bound to the west by the White Pines North Residential Development. This development was built by Ardstone Homes Ltd and has recently been completed providing 167 no. houses and 8 no. apartments.



Plate 2.4: View of southwestern site boundary, Source: TPA, 2021



Plate 2.5: View of western site boundary, Source: TPA, 2021

Northern Site Boundary

The site is bounded to the north by a linear park (shown below in Plate 2.6) adjacent to the M50, providing pedestrian and cycle connections from White Pines North.

North of the M50, lies the established residential areas of Airpark, Orlagh and Prospect, comprising a mix of 2 two storey semi-detached houses, see Figure 2.2 above.



Plate 2.6: View of Northern site Boundary, Looking West, M50 Right, Source: TPA, 2021



Plate 2.7: View of Linear Park at Northern site Boundary, M50 Left, Source: TPA, 2021

Eastern Site Boundary

The site is bound to the east by Green Acres House, shown in Plate 2.9 below. The Stocking Hill residential development is also located further east. The eastern boundary of the site is screened by a number of mature trees and hedgerows, the majority of which will be retained as part of this application.



Plate 2.8: View of South Eastern Site Boundary. Source: TPA, 2021



Plate 2.9: View of North Eastern Site Boundary, showing Green Acres House. Source: TPA, 2021

2.3 Planning Context

a) South Dublin Development Plan 2016-22

The application site is located within the administrative boundary of South Dublin County Council and as such is guided by the policies and objectives set out in the South Dublin County Council Development Plan 2016-22 (SDCCDP).

The site is zoned for 'New Residential' in the SDDP 2016-22. This zoning objective for this designation seeks;

"To provide for new residential communities in accordance with approved area plan"

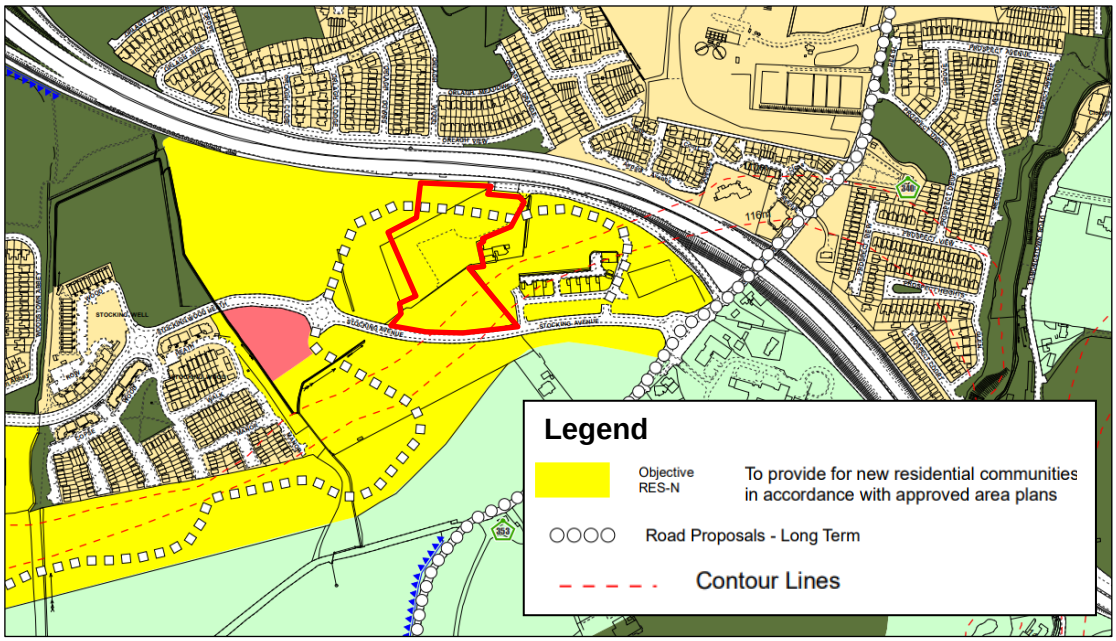


Figure 2.3: Zoning Map SDDP 2016-22, Application Site Outlined Red (cropped and annotated by TPA, 2021)

a) Ballycullen Oldcourt LAP 2016-22

There is also an adopted Local Area Plan for the area, the Ballycullen - Oldcourt Local Area Plan (BOLAP) 2014 (Extended 2019), which will expire on 2nd June 2024.

The site is also Zoned for 'Proposed Residential' in the *BOLAP 2014*.

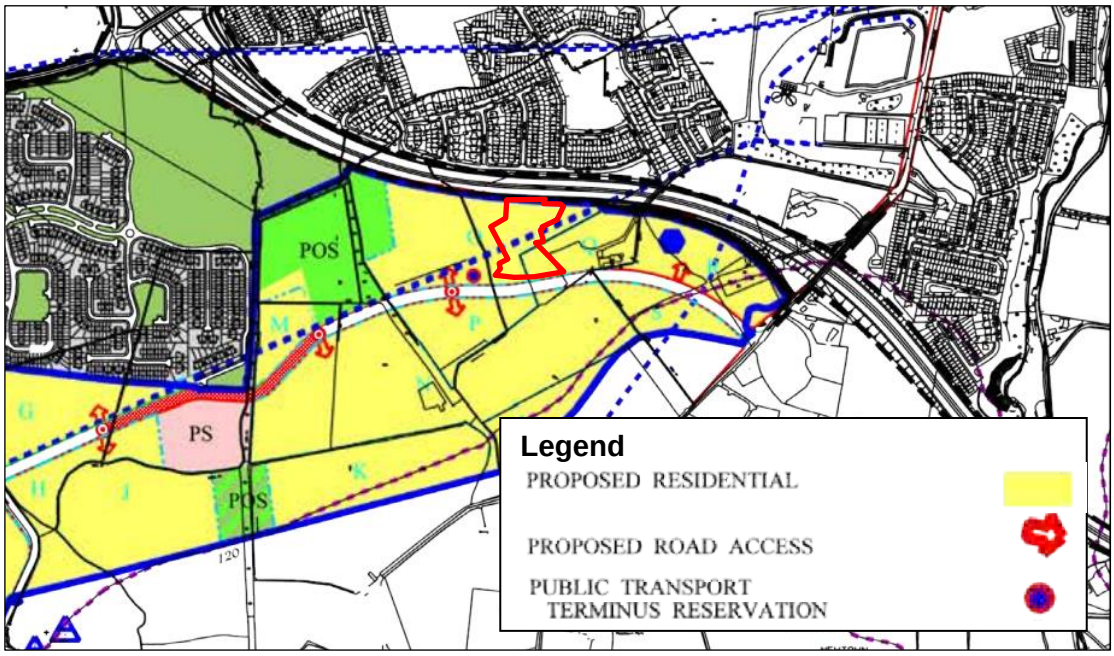


Figure 2.4: Zoning Map Ballycullen-Oldcourt LAP 2014, Application Site Outlined Red (cropped and annotated by TPA, 2021)

For a detailed breakdown of how the proposed development is in accordance with Local and National Planning Policies and Objectives, please refer to the Planning Statement, and Statement of Consistency prepared by TPA, submitted with this application.

2.3 Protected Structures and Monuments

There are no recorded monuments within a 500m radius of the proposed development area. There two Protected Structures (also recorded by the NIAH), a gate lodge (RPS No. 335) c. 265m to the south associated with Woodtown Park/Manor and the Ballyboden Waterworks (RPS. No. 333) c.430m to the northeast.

3.0 DESCRIPTION OF PROPOSED DEVELOPMENT

3.1 Introduction

This chapter of the *Environmental Impact Assessment Report* has been prepared by Tom Phillips + Associates in conjunction with John Fleming Architects. It provides a detailed description of the project, together with details of the existing environment surrounding the site. In accordance with Article 5(1)(a) of the 2011 EIA 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*".

In summary, the proposed development will comprise the construction of 241 no. residential units and a c.552 sq.m Community Building Space on a site of c.2.98Ha. All residential units are proposed as build to sell.

3.2 Characteristics of the Proposed Development

The project will comprise:

- 241 no. residential units comprising:

Units Type	Number of Units Proposed
One Bed Apartments	93
Two Bed Apartments	148
TOTAL	241

Table 3.1: Proposed Residential Mix

The development primally comprises 5 No. buildings (Described in the application as Blocks A to E) ranging in height from 4 –6 storeys. The development will also provide 28 no. 2 bed apartments, provided within 3 no. 3 storey Duplex building, located to the west of the site. The residential blocks are positioned to provide pedestrian routes through the site, incorporating landscaped public open spaces.

A new vehicular access to the site will be provided from Stocking Avenue. Internal pedestrian and vehicular access to/from White Pines North will also be provided to the north west of the site. Additional pedestrian and cycle access will also be provided from White Pines North, to the south west of the site, internally, adjacent to the vehicular entrance on Stocking Avenue.

Existing public foul drainage infrastructure is located along the northern boundary of the site. As the site falls from its high point on its southern boundary toward its northern boundary, this will facilitate a gravity foul drainage connection. For further information, please refer to Chapter 10 of this EIAR.

The proposed development will provide 204 no. car parking spaces as follows;

Units	Provision
Resident On-Street Parking Spaces; (15 accessible spaces and 106 remainder)	194
Community Building Parking Spaces	10
TOTAL	204

Table 3.2: Proposed Car Parking

In total 360 no. long stay secure cycle parking spaces will be provided to serve the residential element of the proposed development. 55 no. additional short stay spaces are also provided throughout the development site, adjacent to apartment entrances and significant areas of open space. 7 no. additional cycle parking space will also be provided to serve the community building space.

A more detailed description of the proposed development is set out in section 3.2.4 below.



Figure 3.1: White Pines East Development Sites [Source: JFA Site Layout Plan]

3.2.1 Site Area

The site has an overall area of c.2.98 ha. The planning application site forms part of a larger masterplan development site, comprising White Pines North, White Pines South, White Pines Retail and White Pines Central.

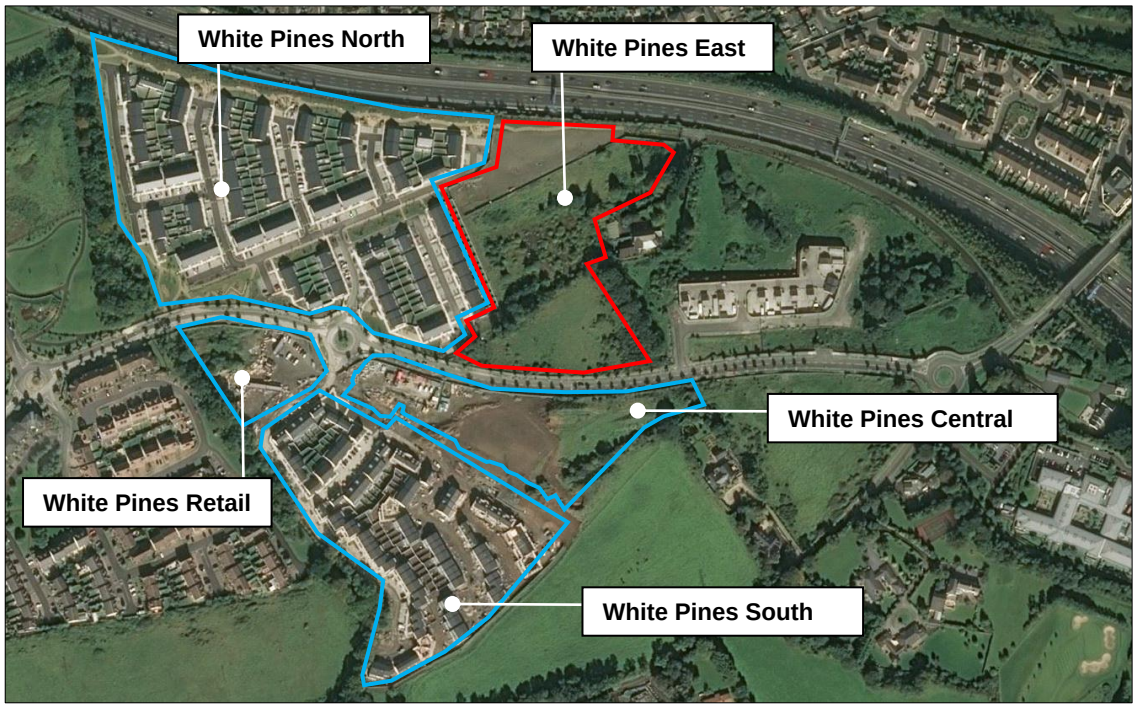


Figure 3.2: Ardstone Homes Ltd Development Sites [Source: Bing Maps], annotated by TPA 2020.

3.2.2 Density of Development

As noted above, this planning Application at White Pines East represents the third residential phase of development for the wider White Pines Masterplan Site. It is therefore considered, in the interest of providing a balanced and sustainable community, with a mix of tenure types and housing, the proposed development should be assessed as a component of the wider White Pines Masterplan development.

White Pines Residential Phases	No. of units	Site Area	Dwellings per Ha
1. White Pines North	175	6.17	28.3
2. White Pines South	106	2.83	37.45
3. White Pines East	241	2.98	80.9
Subtotal	**522**	**11.98**	**43.57**
Forthcoming Planning Applications			
4. White Pines Central SHD	c.137	2.2	62.27
TOTAL	**659**	**14.18**	**c.46.47**

Table 3.3: White Pines Masterplan Site Densities

As noted in Table 3.3 above, as a result of the subject application the proposed development at White Pines East will result in an overall residential density for the White Pines masterplan site of c. 43.6 units per Ha.

3.2.3 Detailed Description of Development

The development will consist of:

- *"The construction of 241 no. residential units, in 5 no. apartment blocks, ranging in height from 4-6 storeys, and 3no. three storey duplex block. The development will provide 93 no. 1 Bed and 148 no. 2 bed units, as follows;*
  - *Block A is a 5 storey block comprising 40 units (20 no. 1 bed units; and 20 no. 2 bed units). Block A includes balconies on southern, northern and western elevations. A dedicated community building space comprising 552sq.m will also be provided on the ground floor of Block A.*
  - *Block B is a 4 storey block comprising 34 units (18 no. 1 bed units; and 16 no. 2 bed units). Block B includes balconies on southern, southern, western and eastern elevations;*
  - *Block C is a Part 4 Part 5 storey block comprising 43 units (21 no. 1 bed units; 22 no. 2 bed units) Block C includes balconies on southern, eastern and western elevations. Residential Tenant Amenities comprising c.171sq.m is provided at ground floor level of Block C to serve all residential units, comprising; a reception area, games space, residents lounge and gym space.*
  - *Block D is a 5 storey block comprising 49 no units (17 no. 1 bed units and 32 no. 2 bed units). Block D includes balconies on southern, western and eastern elevations;*
  - *Block E is a 6 storey block comprising 47 no units (13 no. 1 bed units and 34 no. 2 bed units). Block E includes balconies on southern, western, eastern and northern elevations;*
  - *3 no. 3 storey duplex blocks are provided to the western boundary of the site, comprising 28 no. 2 bed units. Balconies and terrace space is provided to the eastern elevation.*
- *Provision of 204 no. on street car parking spaces*
- *Omission of creche as approved under SDCC Ref. SD14A/0222;*
- *The main vehicular access to the scheme will be from Stocking Avenue. A second new vehicular access is proposed from White Pines North to the east.*
- *Provision of 401 no. bicycle parking spaces;*
- *All other ancillary site development works to facilitate construction, site services, piped infrastructure, ESB sub-stations, plant, public lighting, bin stores, bike stores, boundary treatments and provision of public and private open space including hard and soft landscaping, plant, provision of public and private open space areas comprising hard and soft landscaping, site services all other associated site excavation, infrastructural and site development works above and below ground."*

3.2.4 Site Clearance Works

Topsoil and subsoil will be excavated to facilitate site preparation, construction of foundations, and the installation of underground services. The volume of material to be excavated has been estimated by the project engineers to be c.10,000m^3. It is anticipated that c.7,500m^3 of excavated material will need to be removed offsite for appropriate reuse, recycling or disposal, however it is envisaged that c.2,500m^3 of soil be reused onsite in landscaping and non-structural fill.

3.2.5 Building Height/Form/Massing

The proposed development comprises 5 no. residential blocks, and 3 no. three storey duplex blocks. The proposed building heights have been carefully designed in response to the site's topography with the development's tallest building, Block E at 6 stories, located at the lowest part of the site, along the site's boundary to the M50.

The overall heights within the scheme vary from 3 to 6 storeys over basement level in height, with the overall heights of the blocks ranging from +c.10.205m OD to +c.19.125m OD.



Figure 3.3: Blocks C & B North-western Aspect, Source:3D Design Bureau 2021.

3.2.6 Design and Building Materials

There is a broad range of materials proposed within this development, varying depending on use and location within the development. In general, the elevations comprise the use of brick, render and glass within the elevations of Blocks A, B, C and D and the duplex blocks.

3.2.7 Residential Use

The proposed development comprises a total of 241no. residential units. The development has been designed to exceed standards as set out in the *Sustainable Urban Housing: Design Standards for New Apartments: Guidelines for Planning Authorities*, 2020, prepared by the Department of Housing, Planning and Local Government.

Residential Accommodation

All residential units will be provided as traditional build to sell apartments, in a mix of 1 and 2 bed units over 5 apartment blocks and a 3 duplex blocks.

A c.171sq.m residential amenity space is also provided, at the ground floor of Block C, to serve the residential units. A detail description of each of the Blocks is provided below.



Figure 3.4: CGI 1, View of Proposed Development Internal Open Space; Source: Source:3D Design Bureau 2021.

Block A

Block A, the 5 Storey (+c.16.245m OD) building will provide 40 no. residential units, in a mix of 20 no. one beds and 20 no. two beds.

Block A comprises balconies on southern, northern and western elevations. Block A also provides c.552sq.m of residential amenity space at ground floor level to serve the residential units.



Figure 3.5: Block A South and Eastern Elevations [Drawing no. WPE-JFA-EL-AB-DR-A-P4001, prepared by JFA]

Block B

Block B, the 4 Storey (c.+13.575m OD) building will provide 34 no. residential units, in a mix of 18 no. one beds and 16 no. two beds.

Block B comprises balconies on southern, eastern and western elevations.



Figure 3.6: Block B East Elevation [Drawing no. WPE-JFA-EL-AB-DR-A-P4002, prepared by JFA]

Block C

Block C, the 5 Storey (+c.16.35m OD) building will provide 43 no. residential units, in a mix of 39 no. one beds and 32 no. two beds. Tenant amenity Space of 171sq m is also provided on the ground floor of Block C

Block C includes balconies on southern, eastern and western elevations.

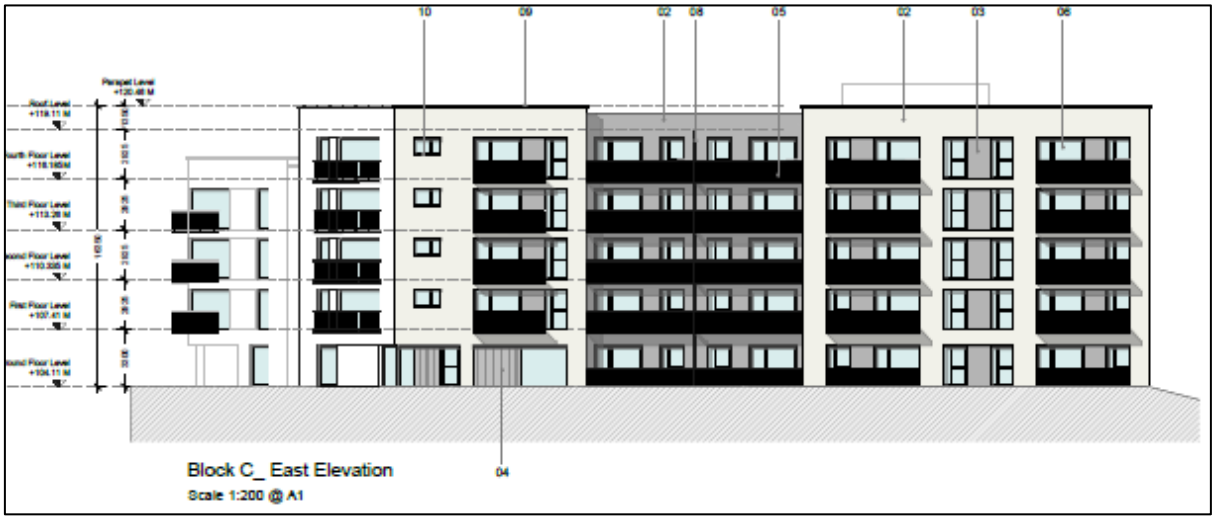


Figure 3.7: Block C East Elevation [Drawing no. WPE-JFA-EL-AB-DR-A-P4003, prepared by JFA]

Block D

Block D, the 5 Storey (+c.16.2m OD) building will provide 49 no. residential units, in a mix of 17 no. one beds and 32 no. two beds.

Block D includes balconies on southern, northern, western and eastern elevations.



Figure 3.8: Block D North West Elevation [Drawing no. WPE-JFA-EL-AB-DR-A-P4004, prepared by JFA]

Block E

Block E, the 5 Storey (+c.19.125 OD) building will provide 47no. residential units, in a mix of 13 no. one beds and 34 no. two beds.

Block E comprises balconies on southern, northern, western and eastern elevations.



Figure 3.9: Block E North Elevation [Drawing no. WPE-JFA-EL-AB-DR-A-P4005, prepared by JFA]

Duplex Units

28 No. 2 bed units will be provided to the western boundary of the site within 3 no. 3 storey (+c. 10.205 OD) duplex buildings. The buildings will provide 14 no. 2 Bed (77.4 sq.m GFA) units at ground floor level and 14 no. 2 Bed (95.4 sq.m GFA) units at first and second floor level.

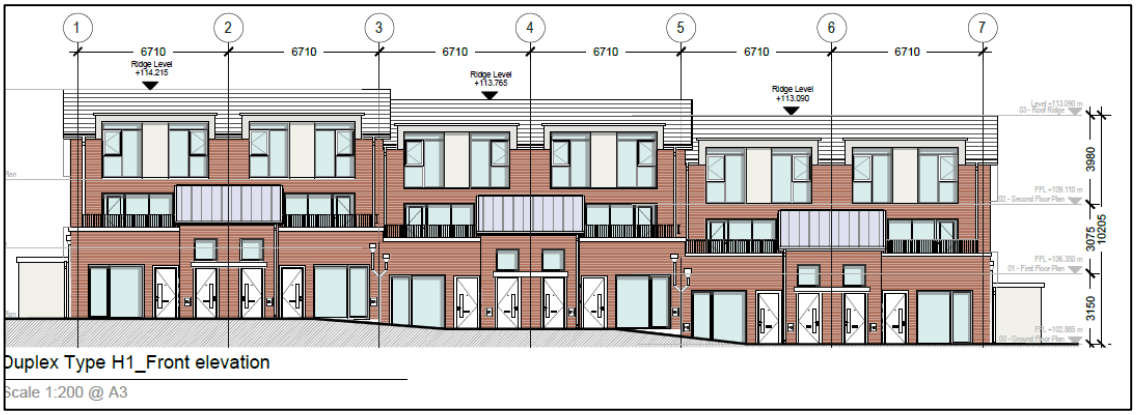


Figure 3.10: Duplex Units [Drawing no WPE-JFA-EL-H1-DR-A-P4001, prepared by JFA]

3.2.8 Community Use

As noted above, a c.552 sq.m Community Building space will also be provided on the ground floor of Block A. The building will provide adaptable multi-function rooms, meeting room, Kid's Room, a shared kitchen/lounge space, administration space and ancillary spaces.

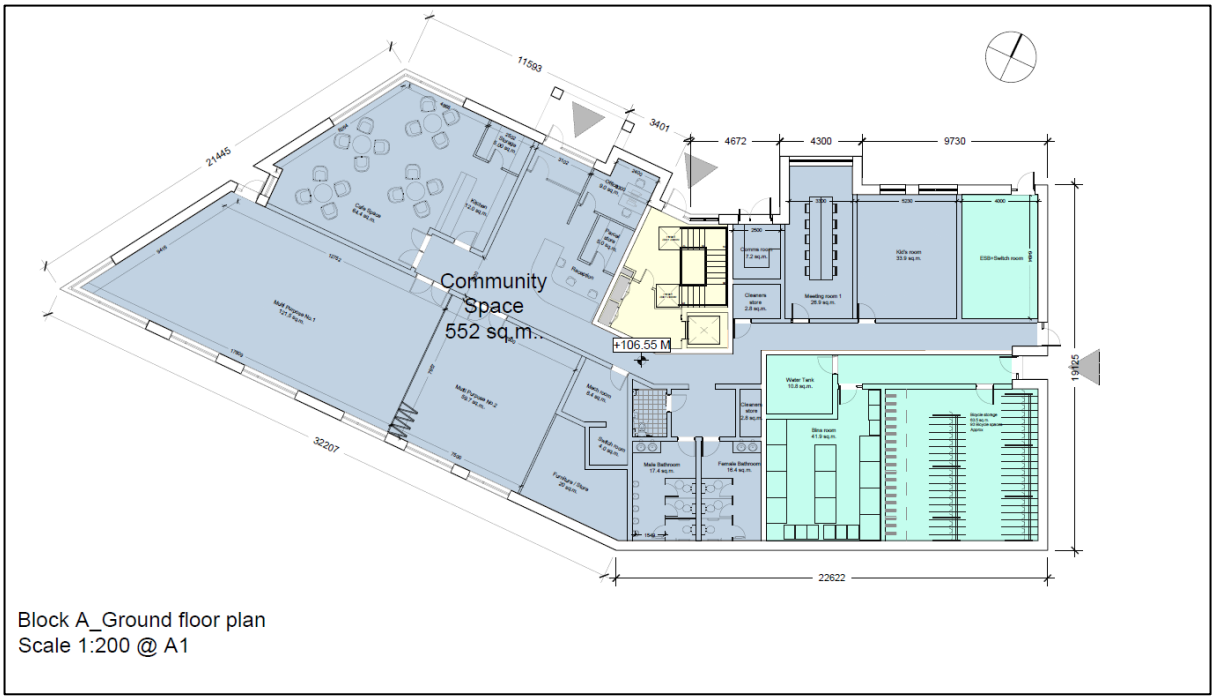


Figure 3.11: Block A Ground Floor Plan [Drawing no WPE-JFA-XX-AA-DR-A-P2001, prepared by JFA]

3.2.9 Access Arrangements

As shown in Figure 3.11 below, the main vehicular access to/from the subject development will be provided via Stocking Avenue, on the southern boundary of the site. There will also be a secondary vehicular access to/from White Pines North, via a new junction on the north-western boundary of the site.

These vehicular accesses are also accessible to both pedestrian and cyclists. There are additional pedestrian access points located to the south, providing access to Stocking Avenue,

and to the north, providing access to the pedestrian / cycle connection, shown below. This pedestrian / cycle connection directly connects Stocking Lane and Scholarstown Road.

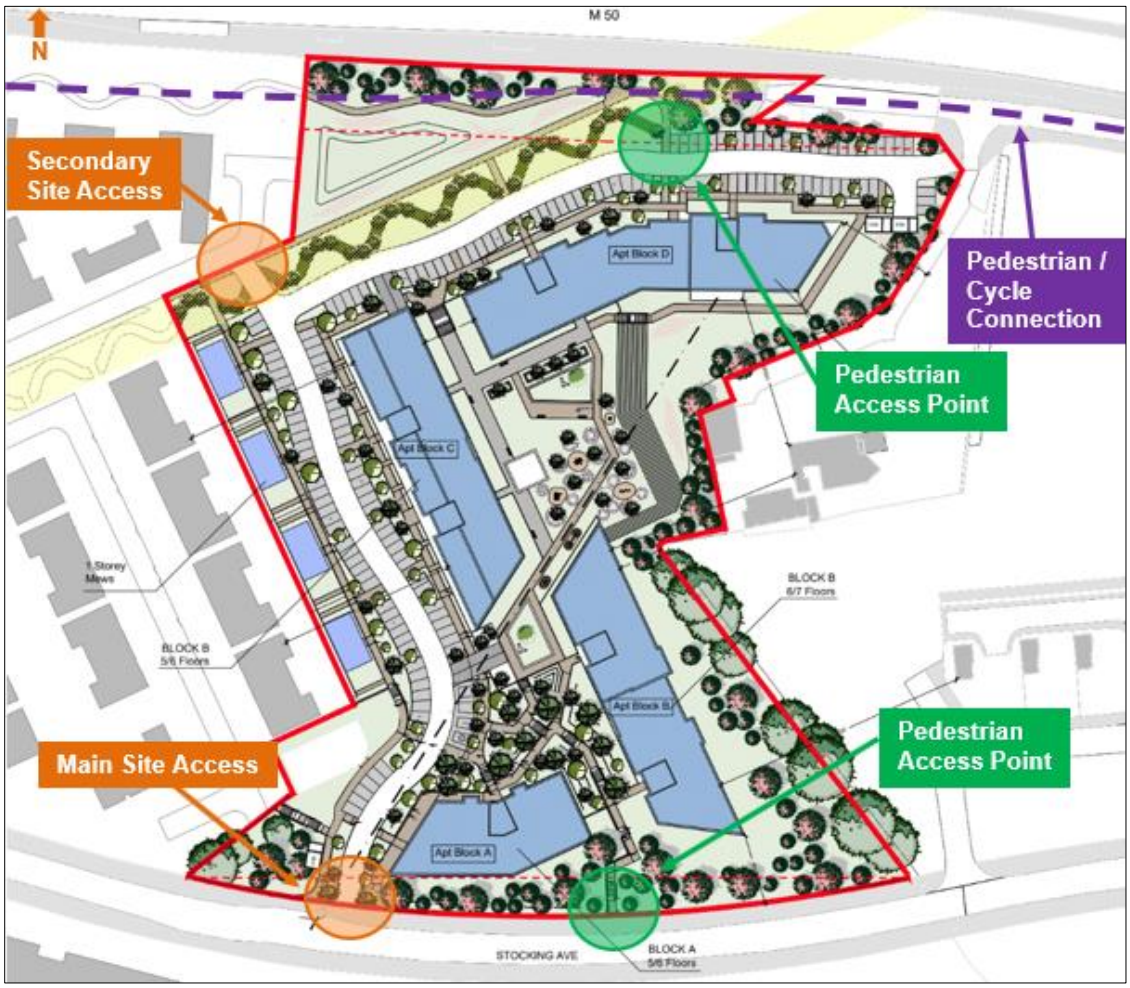


Figure 3.12: Proposed Site Access Locations, [Source DBFL, Figure 14.5 of this EIAR]

We refer to Chapter 14 Material Assets – Traffic and Transportation, which provides full description and assessment of the traffic and transportation impacts arising from the proposed development.

3.2.10 Landscaped Spaces

The architect landscaped spaces have been designed to create a sense of place, supporting the urban design layout in the creation of streetscapes and residential spaces. The design strategy aims to promote sociability, providing places for social interaction and the creation of a sense of community.

The strategy has been prepared by Mitchell and Associates in the context of the provisions of the *Ballycullen and Oldcourt LAP 2014* and informed by detailed assessments undertaken as part of the development process, as outlined further in the EIAR and supporting planning application documents. Mitchell and Associates were the Landscape Architects responsible for the adjoining White Pines North Scheme.

The approach to the site layout and landscape masterplan prioritises non-vehicular traffic on internal roads with pedestrian desire lines catered to. Inherent to the design is a people-friendly layout.

The provision of a landscaped amenity space with various character areas (e.g. landscaped buffer zone (wild grasses); kickabout / key public realm nodes; and children's play area) will cater for a wide range of future users.



Figure 3.13: Proposed Landscape Layout [Source: MA]

3.2.11 Drainage Infrastructure

Foul Drainage

Existing public foul drainage infrastructure is located along the northern boundary of the site. As the site falls from its southern boundary toward its northern boundary, this existing infrastructure will facilitate a gravity foul drainage connection. For further information please refer to Section 10.4.4 of this EIAR.

Pre-Connection Feedback has been received from Irish Water advises that *"Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the networks(s), as assessed by Irish Water, we wish to advise you that, subject to*

a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated". Refer to Appendix 10.B for Correspondence with Irish Water.

Surface Water Drainage
Existing public surface water drainage infrastructure is located along the northern boundary of the site and outfalls via a pipeline under the M50 and onwards through piped networks in the Scholarstown / Knocklyon areas (ultimately discharging to the River Dodder).

As the site falls from its southern boundary toward its northern boundary, this existing infrastructure will facilitate a gravity surface water drainage connection.

For further information please refer to Section 10.4.5 of this EIAR.

Water
An existing 500mm watermains is located along the South side of Stocking Avenue. It is proposed for the development to take a 200mm diameter watermain from the existing infrastructure on Stocking Avenue. Which will also connect to Stocking North creating a single looped connection to serve the development.

All connections, valves, hydrants, meters etc. have been design and are to be installed in accordance with Irish Water's Code of Practice / Standard Details and the Department of the Environment's Building Regulations "Technical Guidance Document Part B Fire Safety".

A post development average hour water demand of 1.41 l/sec and a post development peak hour water demand of 7.06 l/sec has been calculated as outlined in Irish Water's Pre-Connection Enquiry Application Form. For further information please refer to Section 10.4.6 of this EIAR.

3.2.12 Site Clearance and Construction

Details of the demolition and construction programme are outlined in greater detail in a Construction Management Plan, prepared by DBFL Consulting Engineers, and included with this EIAR.

3.2.13 Development Projects Proximate to Subject Site

The following projects are known to have permission / be under construction in the wider area:

Reg. Ref.	Address	Decision	Description
Completed/Approved Ardstone Homes Development			
South Dublin Reg. Ref. SD19A/0345, as amended SDCC Ref. SD20A/0322)	White Pines Retail	Granted 10.02.2021	Planning permission was granted permission for the construction of a neighbourhood centre comprising: a single storey convenience retail unit (c.1,688 sq.m. GFA) and a three storey creche building (c.591sq.m. GFA).
South Dublin Reg. Ref. SD19A/0099/	White Pines South	Granted 26.09.2019	Retention permission was sought for works proposed to 65 no. houses. The overall development related to the

Reg. Ref.	Address	Decision	Description
ABP Ref. PL06S.304670			construction of 99 no. houses permitted under Ref. SD17A/0359 on a site of c.2.29 ha at Stocking South.
South Dublin Reg. Ref. SD14A/0222, as amended SD14A/0222 SD17A/0359	White Pines North -	Granted 20.03.2015	Planning permission was granted for a 10-year permission for the construction of 175 no. residential units; 167 no. houses and 8 no. apartments.
Forthcoming Planning Applications			
ABP Ref. PL06S.307307	White Pines Central SHD	N/A	An SHD Pre-application submission was made to ABP in November 2020, by Ardstone Homes, comprising the development of 137 no. residential units, on a site opposite the subject site on Stocking Avenue, see Figure 1.2 above. A Pre-application tripartite SHD meeting is scheduled to be held with ABP and SDCC February 2021.

Table 3.3: Ardstone Development Sites surrounding White Pines East



Figure 3.12: Site Location, Subject Site Outlined Red. [Source: Bing Maps: Cropped/Annotated by TPA, 2021

3.2.14 Production of Waste

A Construction & Demolition Waste Management Plan and Operational Waste Management Plan, prepared by AWN, have been included with this EIAR in order to document the anticipated levels of and types of waste likely to be generated by the proposed development.

The Construction and Demolition Waste Management Plan provides details regarding the anticipated waste generation on foot of the construction phase of the proposed development, potential impacts and proposed mitigation measures to ameliorate any anticipated negative impacts.

The Operational Waste Management Plan provides details on the anticipated levels of waste the operational phase of the development may give rise to, also detailing measures for the collection, recycling and disposal of this waste.

In summary, all waste generated during the construction and operational periods is proposed to be appropriately disposed of in accordance with the relevant waste management policy and waste management plans.

3.2.15 Emissions and Nuisances

No significant impacts are likely to arise in terms of emissions and nuisances during the construction and operational period of the development. A detailed assessment of the potential impacts on noise and vibration and air quality is contained in Chapters 11 and 12 of this EIAR respectively. In addition, the preliminary Construction Management Plan details the mitigation measures proposed to ameliorate any potential negative impacts.

3.2.16 Risk of Accidents

The risk of accidents arising as a result of the proposed development at both construction and operational phases will be minimised through detailed design considerations and health and safety management. Details of these design considerations and management measures are contained in the Preliminary Construction Management Plan appended to this EIAR.

3.2.17 Secondary Projects

The subject proposal is not reliant on the completion of secondary projects and is thus a fully functioning independent project.

As shown in Figure 3.1 above, Ardstone Homes Ltd have developed a number of sites surrounding White Pines East for residential development and are also in the process of delivering 2 no. additional developments. A convenience retail store and creche know as White Pines Retail and a separate SHD planning application known as White Pines Central, south of the subject site. These projects are entirely independent and in no way reliant on each other.

4.0 EXAMINATION OF ALTERNATIVES

4.1 Introduction

This chapter of the *Environmental Impact Assessment Report* was prepared by Tom Phillips + Associates and examines the alternative development options which were considered for the subject site during the design development process.

The requirement to consider alternatives within an EIAR is set out in Annex IV (2) of the EIA Directive (2014/52/EU) and in Schedule 6(1)(d) of the *Regulations,* which require the following information to be included:

> "*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 options chosen, taking into account the effects of the proposed development on the environment*" (our emphasis).

Reasonable alternatives may relate to project design, technology, location, size and scale which were studied in the preparation of the EIAR relevant to the proposed development and its particular characteristics, together with an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

The *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* of August 2018 provide further guidance on this matter as follows:

> "*The types of alternatives will depend on the nature of the project proposed and the characteristics of the receiving environment. For example, some projects may be site specific so the consideration of alternative sites may not be relevant. It is generally sufficient for the developer to provide a broad description of each main alternative studied and the key environmental issues associated with each. A 'mini-EIA' is not required for each alternative studied*".

Thus, the consideration and presentation of the reasonable alternatives studied by the project design team is an important requirement of the EIA process.

4.2 Rationale for the Proposed Development

The rationale for the development is to provide residential accommodation in accordance with the zoning designation for the site. This is fully supported in National, Regional and Local planning policy. In this regard, the *National Planning Framework 2040- Our Plan (2018)*, identifies the need for consolidated growth in urban areas,

> "*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*". (our emphasis)

The provision of high-density apartment development is advocated in the *Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities 2018.*

The development of the site is also supported under the *Eastern & Midland Regional Assembly - Regional Spatial & Economic Strategy 2019-2031*(RSES)Objective (RPO) 4.3, which seeks 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.*"

4.3 Main Alternatives Studied

The main alternatives studied during the development of the project comprise alternative design solutions and layouts for the redevelopment of White Pines East to provide a residential development on the site, in accordance with National, Regional and Local planning policy guidelines, as discussed further in Section 4.3.4 below.

4.3.1 Alternative Locations

Given the project comprises the redevelopment of White Pines East, a site zoned for new residential development, the consideration of alternative locations is not relevant in this instance.

4.3.2 "Do-Nothing" Alternative

In the "Do-Nothing" scenario, the application site at White Pines East would remain a greenfield site. This would be contrary to National and Regional Policy where it is the stated aim to progress development of zoned and serviced site such as the application site. Zoned serviced sites which do not progress towards development are subject to a vacant site levy.

4.3.3 Alternative Processes

Given the zoning objectives for the site, the rationale for the project, the nature of the proposed development, no reasonable alternative processes were considered appropriate.

4.3.4 Alternative Design Approach – Alternate Block Layouts

At the outset the project architects, JFA, undertook an extensive site appraisal to determine the appropriate scale, mass and layout of this scheme.

The analysis includes an assessment of:

- Existing and permitted development adjoining the site and within the wider area which changes the character of the site environs, i.e. White Pines North, White Pines South, White Pines Retail and White Pines Central.
- The characteristics of the site to consider how the proposed development should appropriately respond to adjoining site, specifically; Stocking Lane, Green Acres House, White Pines North and the M50.
- The existing residential mix at Stocking Avenue, with a high proportion of 3-5 bed houses.

- The provisions of Local, Regional and National planning policy as referenced above and in particular, the provisions of the *South Dublin Development Plan 2014 and Ballycullen Oldcourt LAP, 2014* (extended to 2022), which sets out proposed uses and design criteria.

The masterplan for the site, and surrounding sites in the ownership of Ardstone Homes Ltd (please refer to Figure 1.1) has been informed by National, Regional and Local planning policies, in particular the BOLAP 2014, which sets out a number of specific adjustives for the area, e.g. the provision of a Community Building.

A number of design options were thereafter developed for the site, as shown below in Figures 4.1 – 4.4 below.

The final layout, as progressed, provides a large centrally located area of open space, c. 13,347sq.m which is surrounded by apartment blocks to the north, south and west. The proposed orientation allows for increased sunlight penetration into the scheme, whilst also providing passive surveillance of this space.

The design of the proposed development also ensures this space is sheltered from all sides, by the proposed apartment blocks and mature trees, to create a high-quality attractive centrally located area of public open space, with a number of incidental child play areas, kick about spaces and hard and soft landscaping features.

As noted in the Landscape Design Statement, prepared by Mitchell and Associates (MA), the overall aim of the landscape design is to create a high quality attractive environment with amenity facilities for the residents of the proposed residential development, with the following design objectives, which have been progressed through pre-application consultation with South Dublin County Council and An Bord Pleanála, detailed below;

- *"To create a high quality attractive environment with amenity facilities for the proposed residents. We are providing 38% public open space.*
- *To retain existing trees and hedgerows where possible so that the scheme has an appropriate degree of maturity from the outset.*
- *To integrate with the existing and future surrounding context with new physical and visual connections through the development.*
- *To create a network of external routes that allow for flexibility in movement, for social interaction and active play as well as spaces that are quiet and calming, spaces which allow a connection to different habitats and enable a tree and hedgerow planting structure to be*
- *established across the site.*
- *To develop a suite of boundary treatments that respond to the varying site conditions, the proposed surrounding context and the local vernacular.*
- *To create a 'free play' strategy for the scheme that takes cognisance of local and regional play facilities under the guidance of South Dublin County Council (see section 1.5).*
- *To undertake a fully coordinated approach to site services, in particular to SUDS.*
- *To develop a palette of hard and soft landscape materials that will be deployed in a sophisticated manner. The materials will have a bespoke quality (in certain instances), be durable, and respond to budget allocation.*

For further information on the proposed landscape design, please refer to the Landscape Design Statement, prepared by MA, submitted with this application.

4.3.5 Alternative Layout

The design process for the site included pre-application consultation with South Dublin County Council and An Bord Pleanála, in order to ensure the most efficient layout and successful design outcome is achieved in delivering a scheme which responds to the existing built context surrounding the subject site; and provides a scale, form and quantum of development appropriate for the site.

In considering the effects of these alternatives on the environment, key considerations have been:

- The extent and nature of visual impact from the development within the catchment of the proposed development;
- The residential amenity of the of proposed units having regard to on-going micro-climatic assessment during the design process (Sunlight / Daylight Analysis);
- The location of the site with respect to the provision of local services.

The key considerations and amendments to the scheme, having regard to and the key environmental issues, are set out below.

4.3.5.1.1 Alternate Layout 1: Initial Scheme Design

The design layout shown in Figure 4.1 below was initially considered for the White Pines East site. The initial scheme design shows 4 no. apartment blocks, primarily separated by the provision of an internal vehicle access road, fronted by car parking along all routes.

The proposed landscape design shows a number of incidental play spaces, in a landscape heavily dominated by semi/mature trees, proposed to screen the development, primarily to the east and west.

As shown in figure 4.1, 2 no. of the proposed apartment blocks were proposed in close proximity to the existing residential units at White Pines North, which were to be heavily screened by planting along the eastern boundary of the site.

Following a detailed analysis of the initial scheme design, a number of issues were identified;

- The site's main feature appears to be the internal access road, with development surrounding the centrally located vehicular access route.
- Visually, the site is dominated by the no. of on street parking, required to serve the proposed development.
- The proposed landscape design, particularly to the north of the site, does not integrate well with the existing linear park.
- The proposed apartment blocks, to the west of the site, could potentially overlook the existing residential units at White Pines North.
- The amount and scale of mature trees proposed along the site's eastern and western boundaries, could potentially overshadow existing residential units at White Pines North and Green Acres House.

- The position of the apartment blocks to the south of the site, did not sit well with the site's sloping topography, sloping down from the south.



Figure 4.1: Considered Layout Option 1 [Source: JFA 2019]

4.3.5.1.2 Alternate Layout 2, Advanced Design

JFA sought to resolve the issues highlights in the Initial Scheme Design through the evolution of alternative layout, Layout no.2.

As shown in Figure 4.2, the Advanced Design option for the site, proposed to relocate the primary vehicular access route to the west, distancing the apartment blocks from the existing residential units at White Pines North.



Figure 4.2: Considered Layout Advanced Design, Option 2 [Source: JFA 2019]

The position of the proposed blocks to the south of the site, Blocks A and B, were relocated to address the site's topography

The proposed landscape design provided a number of centrally located courtyard spaces, to serve individual blocks. These areas of public open space were considered to provide a much greater proportion of 'useable open space', to serve the prospective tenants.

Due to the site's sloping topography, and to avoid the use of cut and fill techniques, pedestrian access through the centre of the site was not proposed. An alternative pedestrian route was proposed, to the east along the site's boundary.

Landscaping treatment to the north of the site was reimagined, to address the existing linear park. A large proportion of car parking was also removed from the site layout.

Given the proposed apartment blocks had been set back from the existing residential units at White Pines North, the amount and scale of the proposed tree line was reduced, to address concerns regarding overshadowing

Following a detailed analysis of the Advanced scheme design, a number of issues were identified;

- The location of Block C needed further consideration, to review how the site was addressing White Pines North.
- The landscape design resulted in isolated areas of public open space, and provided no permeability/connections, through the areas of open space.

- As per the phasing requirement for this area of the *Ballycullen Oldcourt Local Area Plan 2014*, the Ardstone lands are required to provide a 190sq.m community building. This needed to be provided in tandem with the proposed development, in accordance with the phasing requirement of the Local Area Plan.
- The proposed development did not provide sufficient car parking to serve the number of residential units proposed.
- The development proposed a number of single aspect north facing units.
- The location of the internal residential amenity space should be provided in a more accessible area of the site.

4.3.5.1.3 Alternate Layout 3: Detailed Design 1

In response to the issues highlighted above, JFA amended the scheme design. Principle amendments are set out below;

- As noted in Figure 4.3, 5 no. single storey mews building were included, to the west of the site, to address the transition zone between the existing residential dwellings at White Pines North. In addition to this, Block C was further set back from the western boundary, thereby achieving a 45m separation distance from the rear facades of the residential dwellings at White Pines North.
- A detailed landscape proposal was also undertaken, by Mitchell + Associates Landscape Architects, to comprehensively address the landscape issues highlighted above.
- Block D was redesigned to ensure the proposed development would not give rise to an area of unusable open space, as detailed above.
- An undercroft car park was included with the development.



Figure 4.3: Preferred Option, Concept Design Strategy [Source: JFA Design Statement 2021]

4.3.5.1.4 Alternate Layout 3: Detailed Design 2

Following confirmation of the preferred layout option, identified in Figure 4.3, the development moved into the next phase, detailed design.

As part of the detailed design, the following revisions were included;

- A community building was included in the development, comprising 167sq.m GFA.
- Landscaping details were advanced to a detailed design.
- Additional screening was proposed to the south of the site, to subtly screen the proposed development along Stocking Ave.
- An additional single storey mews building, to the southwest of the site, was proposed.
- The provision of on-street parking was revised. Parking was primarily positioned in front of physical buildings.
- The proportion of single aspect north facing units was significantly reduced.
- The location of the internal residential amenity space was provided in a more accessible area of the site.



Figure 4.4: Preferred Option, Detailed Design [Source: JFA 2021]

The detailed design was presented to South Dublin County Council (SDCC) on 6th March 2020, at South Dublin County Council's Offices.

In summary, SDCC were supportive of the scheme in general. The main issue raised included compliance with Ballycullen/Oldcourt LAP policy including density/height, visual impact, community facilities, connectivity – road and pedestrian.

Regarding the detailed design of the scheme, SDDC raised the following comments;

- Community Building proposed at 167sq.m is not in accordance with LAP requirement.
- How would the proposed Single Storey Mews Buildings address the existing residential units at White Pines North.

- What would the façade treatment be in relation to Block D;
- The proposed car parking, at 0.87 spaces per unit was considered high.
- Consider podium area and kickabout spaces
- Retain as much hedgerow and trees as possible
- Provide a detailed Landscaped Plan for the Area

4.3.5.1.5 Alternate Layout 4: Detailed Design 1

- **Addressing Comments Received by SDCC**

In response to the issues raised by SDCC, this the following amendments were proposed:

1. **Community Building**

   The Community Building was increased to 195sq.m, in excess of the Local Area Plan requirement of 190sq.m. The building was also relocated. It was originally located at the site's entrance. However, this location was moved north of the site, adjacent to the existing linear park, where it was considered to provide better access for the residents of White Pines North. This resulted in the loss of 1 no. single storey mews building.

2. **Single Storey Mews Buildings**

   The detailed design of the single storey mews buildings was further enhanced, to ensure the proposed units protect the existing residential amenities to the west, at White Pines North. As shown in Figure 4.5 below, the units are designed with a mono-pitch sloping roof, rising away from the site boundary.

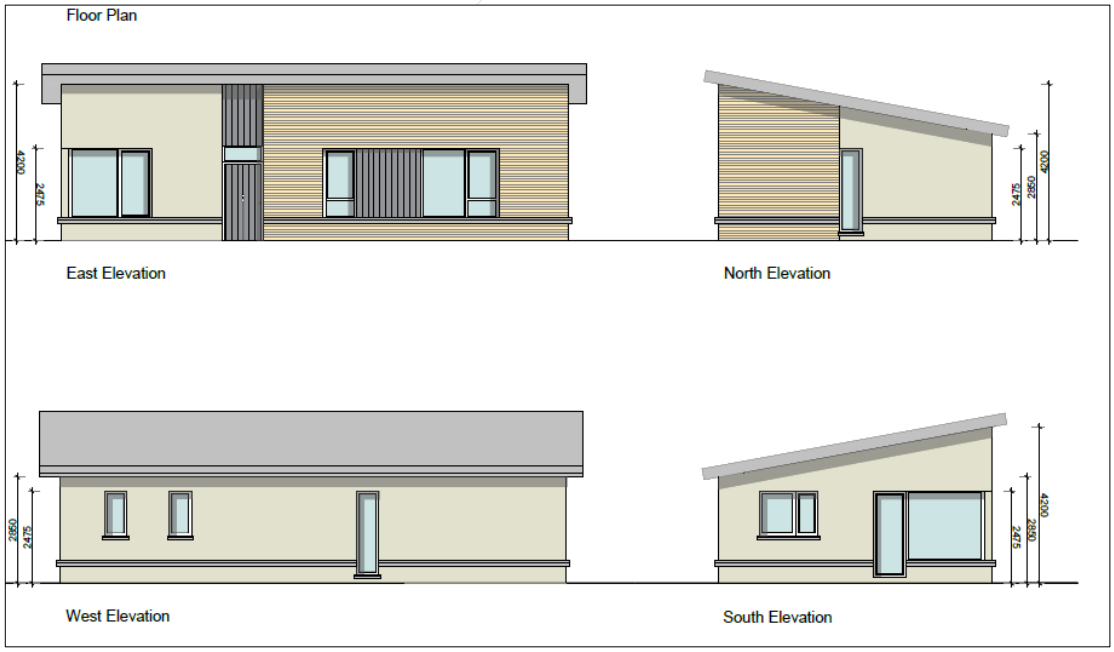


Figure 4.5: Mews Building Elevation, Drawing No. P-M-0-1 [Source: JFA 2020]

3. **Length of Block D**

SDCC considered the length of Block D could result in a large monolithic block. As further detailed in Section 3 of the design statement, prepared by JFA, the façade treatment of Block D was therefore enhanced through the introduction of in and out facades, as shown in Figure 6.6 below.



Figure 4.6: Block D, [Source, Verified Views & CGI's, CGI no. 4, prepared by 3d Design Bureau June 2020]

4. Car Parking

Regarding the proposed car parking, 29 no. car spaces were omitted from the scheme. The number of spaces proposed was reduced from 320 (at c. 0.88 spaces per unit) to 291 no. residential spaces (at c. 0.81 spaces per unit).8 no. additional parking spaces are also proposed to serve the community building.

5. Include Podium Areas and Informal Play Spaces

Podium areas were included, centrally located on site. In addition, informal flat grassed areas are provided as kick about spaces. Two kickabout spaces were proposed. One was located on the eastern boundary of the site, while the other was situated to the north, tying into the existing linear park.

6. Tree and Hedgerow Retention

The proposed development retained a number of trees and mature hedgerows on site, where possible. Nevertheless, a number of existing trees and hedgerows were required to be removed, to facilitate the proposed development. However, a substantial number of trees and further planting is proposed as part of the development. As such, the proposed development was considered to have a net gain in terms of the number of trees and hedgerows to be provided.

7. Landscape Masterplan

A detailed Landscape Masterplan for the site has been prepared by MA. As shown in Figure 4.7.



Figure 4.7: Pre-application landscape design [Source: MA 2020]

4.3.5.1.6 Alternative Layout 5 - ABP Pre-Application Submission

The amendments set out in Section 4.3.5.1.5 were incorporated into the scheme design, to present to ABP for pre-application consultation. The development presented to ABP for pre-application consultation comprised:

- The construction of 359 no. Build to Rent residential units in 4 no. separate apartment blocks ranging in height from 5 – 8 storeys and 3 no. single storey detached 2 bed houses which includes 164 no. 1 bed and 195 no. 2 bed units;
- Block A is a 6 storey block of c. 3,050sqm comprising 49 units (25 no. 1 bed units; and 24 no. 2 bed units). Block A comprises balconies on southern, northern and western elevations;
- Block B is a 7 storey block of c. 6,496sqm comprising 98 units (41 no. 1 bed units; and 57 no. 2 bed units). Block B comprises balconies on southern, northern, eastern and western elevations;
- Block C is a 5 storey block of c. 5,222sqm comprising 80 units (39 no. 1 bed units; 32 no. 2 bed units; and 2 no. 1 Bed Own Door Apartments Units; and 7 no. 2 Bed Own Door Apartments Units) Block C comprises balconies on southern, eastern and western elevations;

- Block D is an 8 storey block of c. 8,638sqm comprising 129 no units (57 no. 1 bed units; 72 no. 2 bed units). Block D comprises balconies on southern, northern and eastern elevations;
- Provision of Residential Tenant Amenities comprising c.537sq.m of is provided at ground and first floor level of Block A to serve all residential units which comprises; Co-Working Space; Communal Residential Lounge; Kitchen and Private Dining Space; Games and Multimedia Room; Gym space; Yoga Room. The space will also provide concierge services and a parcel room.
- Provision of a separate Community Building of 195sqm;
- Provision of 299 no. car parking spaces (including 170 no. undercroft and 129 no. on-street);
- The main vehicular access to the scheme will be from Stocking Avenue. A second new vehicular access is proposed from White Pines North to the east. A separate pedestrian access from White Pines north to the proposed community building at the south west site is proposed;
- Provision of 598 no. bicycle parking spaces (including 90 no. visitor cycle parking spaces);
- All other ancillary site development works to facilitate construction, site services, piped infrastructure, 3 No. ESB sub-stations, plant, public lighting, bin stores, bike stores, boundary treatments and provision of public and private open space including hard and soft landscaping, plant, provision of public and private open space areas comprising hard and soft landscaping, site services all other associated site excavation, infrastructural and site development works above and below ground.



Figure 4.8: Pre-Application Proposal Architectural Layout Plan, Drawing no. P-S-0-2 [Source: JFA 2020]



Figure 4.9: Alternative Layout 5, Block D, [Source, Verified Views & CGI's, CGI no. 3, prepared by 3d Design Bureau June 2020]

The detailed design was presented to ABP, online via Microsoft Teams, on 9th September 2020 (Ref. ABP- 307307-20). Subsequent to this meeting an Opinion was issued by ABP dated 7th October 2020. A detailed response to the issued raised in the Opinion is provided in the *Response to ABP Opinion*, prepared by TPA, submitted with the application.

As noted in the Opinion, the Board considers that the following 1 no. issue needed to be addressed as part of the proposed application, in order to present a reasonable basis for an application for a strategic housing development:

> *"Further consideration of the documents as they relate to the planning rationale/ justification for the proposed height and density on the subject lands, having regard to national, regional and local policy, including, but not limited to, the provisions of the 'Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (including the associated Urban Design Manual)', 'Urban Development and Building Heights - Guidelines for Planning Authorities' and 'Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities'."*

4.3.5.1.7 Alternative Layout 6 – Final Design

To address the Boards comments relating to the proposed height and density a number of specific design amendments have been incorporated into the final design. Most notably;

- Block A has been reduced in height by 1 no. stories, from 6 no. stories to 5 no stories. As a result, the no. of residential units provided in Block A has reduced by 9 no. units.

- Block B has been reduced in height by 2 no. stories, from 6 no. stories to 4 no stories. The footprint of Block B has also been greatly reduced, as shown in Figure 4.9 below. As a result, the no. of residential units provided in Block B has been reduced by 64 no. units.

- The overall heigh of Block C remains unaltered at 5 no. stories. However, the footprint of Block C has been greatly reduced. Furthermore, the Block has also been repositioned to provide a more coherent block layout, as shown below. The no. of residential units provided in Block C has reduced by 37no. units. Block C also includes c.171sqm Residential Tenant amenity space, located on the ground floor of Block C.

- As shown below, Block D has been completely redesigned as part of the current application. The overall height of the Block has been reduced from 8 no. stories to 6 no. stories. In addition to this the block has also been divided into two separate buildings, block D and Block E. The no. of residential units provided in Blocks D and E have also reduced by 33no. Units, when compared with what was previously proposed in Block D.

- The units proposed to the western boundary of the site, previously proposed as 4 no. single storey structures (3 no. residential mews buildings and a c.195sq.m Community Building), have been completely redesigned and repositioned with the site. This area of the site now provides a Block of 3 storey duplex units, providing 28 no. 2 bed apartments. It is considered that a three storey building in this location provides a better progression from the existing 2 storey residential units at White Pines north to the western façade of the 5 storey Block C. It should also be noted that the inclusion of a three storey building in this location will ensure Block C will be entirely screened when viewed from the ground floor rear facades of the existing residential units bordering the site at white pines north.

- The single-story c.195 sq.m Community Building has been removed from the site. The community building space is now provided within the ground floor of Block A. The community centre space is provided to satisfy a phasing requirement of the Ballycullen Oldcourt Local Area Plan (BOLAP) 2014, requiring the provision of a c.195 sq.m. However, it should be noted that the subject development now proposes a c.552 sq.m community building space, substantially in excess of the *BOLAP 2014* phasing requirement. This enlarged space has been provided to provide a more substantial spaces for the local community, following consultation between the Applicant and SDCC.

As a result of the amendments discussed above, the density and height of the proposed development has been greatly reduced. The overall height of the proposed development has reduced from a development of up to 8 no. stories to the current proposal with a maximum height of 6 no. stories.

In addition to the above, a number individual blocks have also greatly reduced in scale. As a result, whereas the development proposed for pre-application consultation proposed a residential density of c.120 units per hectare. The subject application is proposing a residential density of c. 81 no. units per hectare, when considered in isolation.

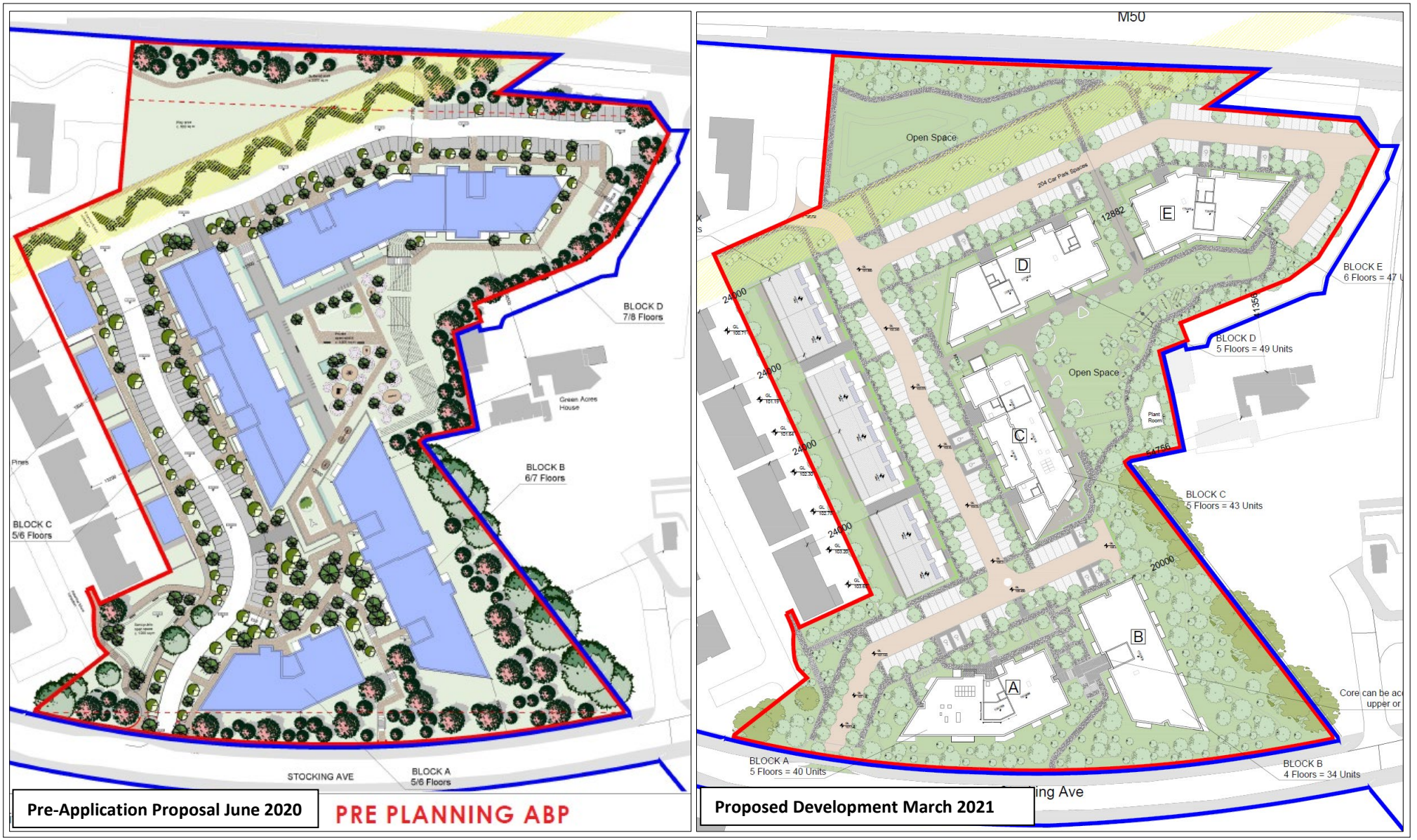


Figure 4.9: Comparison of Proposed Development (March 2021) and Pre-Application Proposal (June 2020)

Landscape Design

Following positive feedback from both SDCC and ABP regarding the landscape design, the layout and design of the landscape has been largely retained. The most notable addition to the landscape design is the inclusion of a pedestrian trail along the eastern boundary of the site, providing a pedestrian link from Stocking Avenue with the large area of open space to the centre of the site and beyond to the linear park on the site's northern edge.

The landscape designed was carefully considered to create a sense of place, supporting the urban design layout in the creation of streetscapes and residential spaces. The design strategy aimed to promote sociability, providing places for social interaction and the creation of a sense of community.

A Landscape Design has been prepared by MA in the context of the provisions of the *Ballycullen and Oldcourt LAP 2014* and informed by detailed assessments undertaken as part of the development process, as outlined above. For further information please refer to the Landscape Design Report prepared by MA.

The proposed landscape design for the site was designed in tandem with the architectural design of the site, and that of White Pines North. As a result, the landscape components are inherent to the architectural layout of the scheme. The development includes extensive areas of landscape architecture. For further information please refer to Figure 4.7 above, and the Landscape Masterplan, prepared by MA, submitted with this application.



Figure 4.10: Final Landscape Layout Plan [Source: MA 2021]

4.4 Final Design: Detailed Description of Development

The description of development is as follows:

Ardstone Homes Ltd. intend to apply to for permission for a Strategic Housing Development at a site of 2.98 ha, at Stocking Avenue, Woodstown, Dublin 16, which is contained within the Ballycullen-Oldcourt Local Area Plan lands.

- *The construction of 241 no. residential units, in 5 no. apartment blocks, ranging in height from 4-6 storeys, and 3no. three storey duplex block. The development will provide 93 no. 1 Bed and 148 no. 2 bed units, as follows;*
  - *Block A is a 5 storey block comprising 40 units (20 no. 1 bed units; and 20 no. 2 bed units). Block A includes balconies on southern, northern and western elevations. A dedicated community building space comprising 552sq.m will also be provided on the ground floor of Block A.*
  - *Block B is a 4 storey block comprising 34 units (18 no. 1 bed units; and 16 no. 2 bed units). Block B includes balconies on southern, southern, western and eastern elevations;*

- *Block C is a Part 4 Part 5 storey block comprising 43 units (21 no. 1 bed units; 22 no. 2 bed units) Block C includes balconies on southern, eastern and western elevations. Residential Tenant Amenities comprising c.171sq.m is provided at ground floor level of Block C to serve all residential units, comprising; a reception area, games space, residents lounge and gym space.*
- *Block D is a 5 storey block comprising 49 no units (21 no. 1 bed units and 28 no. 2 bed units). Block D includes balconies on southern, western and eastern elevations;*
- *Block E is a 6 storey block comprising 47 no units (13 no. 1 bed units and 34 no. 2 bed units). Block E includes balconies on southern, western, eastern and northern elevations;*
- *3 no. 3 storey duplex blocks are provided to the western boundary of the site, comprising 28 no. 2 bed units. Balconies and terrace space is provided to the eastern elevation.*

- *Provision of 204 no. on street car parking spaces*
- *Omission of creche as approved under SDCC Ref. SD14A/0222;*
- *The main vehicular access to the scheme will be from Stocking Avenue. A second new vehicular access is proposed from White Pines North to the east.*
- *Provision of 401 no. bicycle parking spaces;*
- *All other ancillary site development works to facilitate construction, site services, piped infrastructure, ESB sub-stations, plant, public lighting, bin stores, bike stores, boundary treatments and provision of public and private open space including hard and soft landscaping, plant, provision of public and private open space areas comprising hard and soft landscaping, site services all other associated site excavation, infrastructural and site development works above and below ground.*



Figure 4.11: Final Design, Block A at Site Entrance; Source:3D Design Bureau 2021.

4.4.1 Proposed Residential Units

The development will comprise the construction of 241 no. residential units, in 5 no. apartment blocks, ranging in height from 4-6 storeys, and 3 no. three storey duplex blocks.

The project will comprise:

Units Type	Number of Units Proposed
One Bed Apartments	93
Two Bed Apartments	148
TOTAL	241

Table 4.1: Proposed Residential Mix

4.4.1.1 Block A

Block A, the 5 Storey (c.+16.245m OD) building will provide 40 no. residential units, in a mix of 20 no. one beds and 20 no. two beds. A 552sq.m community centre space is also provided on the ground floor of Block A, discussed in detail below.

Block A Includes balconies on southern, northern and western elevations. Block A also provides c.552sq.m community building, provided at ground floor level.



Figure 4.3: Block A South and Eastern Elevations [Drawing no. WPE-JFA-EL-AB-DR-A-P4001, prepared by JFA]

4.4.1.2 Block B

Block B, the 4 Storey (c.+13.575m OD) building will provide 34 no. residential units, in a mix of 18 no. one beds and 16 no. two beds.

Block B Includes balconies on southern, eastern and western elevations.



Figure 4.4: Block B East Elevation [Drawing no. WPE-JFA-EL-AB-DR-A-P4002, prepared by JFA]

4.4.1.3 Block C

Block C, the 5 Storey (+c.16.35m OD) building will provide 80 no. residential units, in a mix of 39 no. one beds and 32 no. two beds. Tenant amenity Space of 171sq m is also provided on the ground floor of Block C

Block C includes balconies on southern, eastern and western elevations.

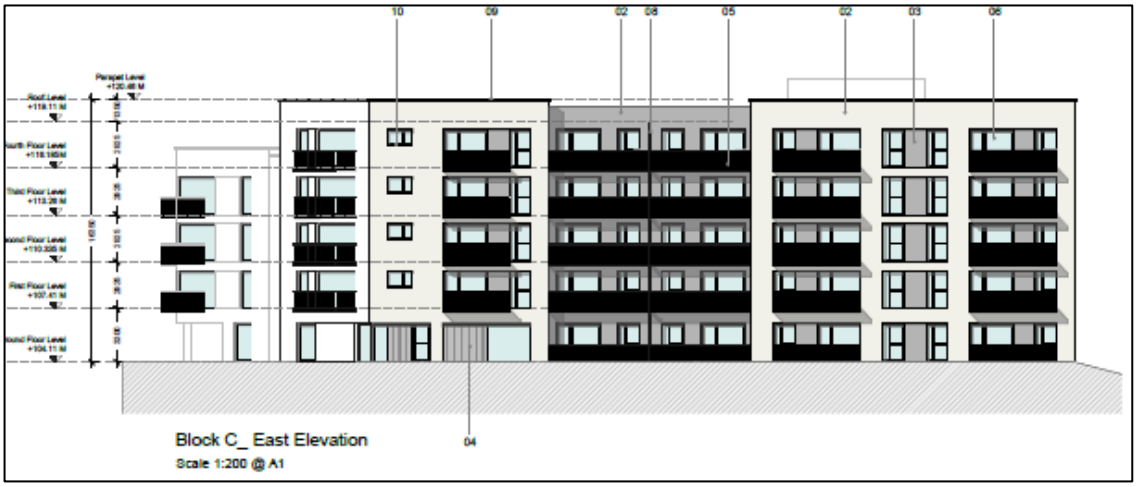


Figure 4.5: Block C East Elevation [Drawing no. WPE-JFA-EL-AB-DR-A-P4003, prepared by JFA]

4.4.1.4 Block D

Block D, the 5 Storey (+c.16.2m OD) building will provide 49 no. residential units, in a mix of 17 no. one beds and 32 no. two beds.

Block D includes balconies on southern, northern, western and eastern elevations.



Figure 4.6: Block D North West Elevation [Drawing no. WPE-JFA-EL-AB-DR-A-P4004, prepared by JFA]

4.4.1.5 Block E

Block E, the 5 Storey (+c.19.125 OD) building will provide 47 no. residential units, in a mix of 13 no. one beds and 34 no. two beds.

Block E includes balconies on southern, northern, western and eastern elevations.



Figure 4.7: Block E North Elevation [Drawing no. WPE-JFA-EL-AB-DR-A-P4005, prepared by JFA]

4.4.1.6 Duplex Units

28 No. 2 bed units will be provided to the western boundary of the site within 3 no. 3 storey (+c. 10.205 OD) duplex buildings. The buildings will provide 14 no. 2 Bed (77.4 sq.m GFA) units at ground floor level and 14 no. 2 Bed (95.4 sq.m GFA) units at first and second floor level.

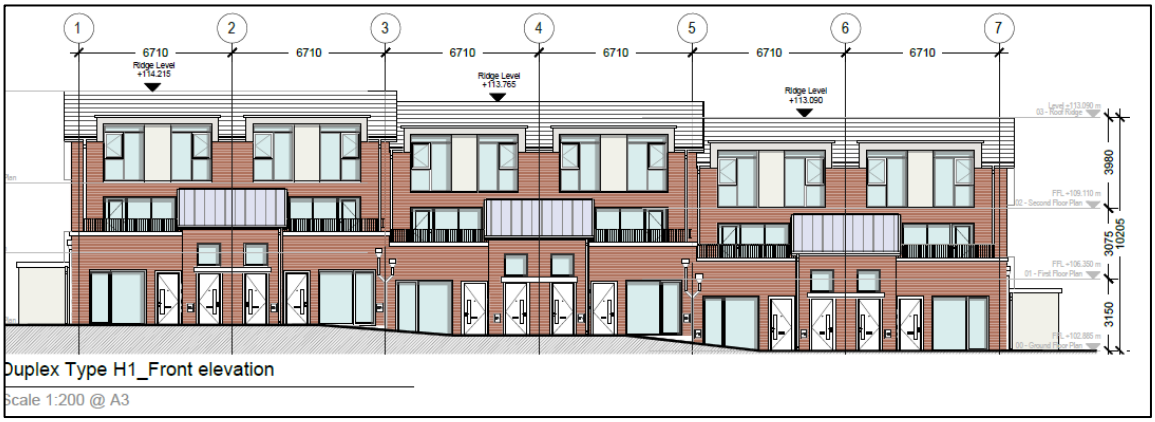


Figure 4.8: Duplex Units front elevation[Drawing no WPE-JFA-EL-H1-DR-A-P4001, prepared by JFA]

It is also noted that there are no windows located on second floor rear facades of the proposed duplex units. This has been specifically designed to avoid any potential overlooking with the existing residential properties at White Pines North.

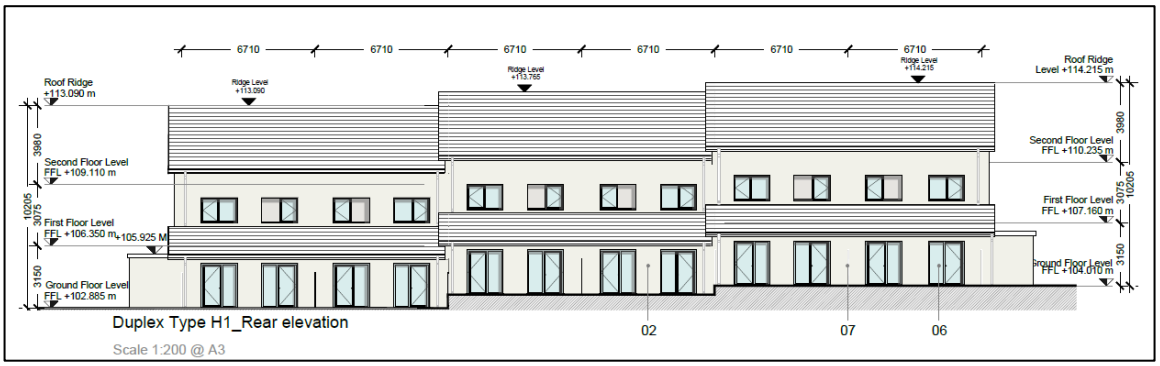


Figure 4.9: Duplex Units rear elevation [Drawing no WPE-JFA-EL-H1-DR-A-P4001, prepared by JFA]

4.4.1.7 Residential Amenity Space

The development will also provide c.171 sq.m of internal residential amenity space on the ground floor of Block C. This space will provide a gym, residents lounge, reception area and a wide range of services and support facilities. These services / facilities will be available for the use of all residents in the development.

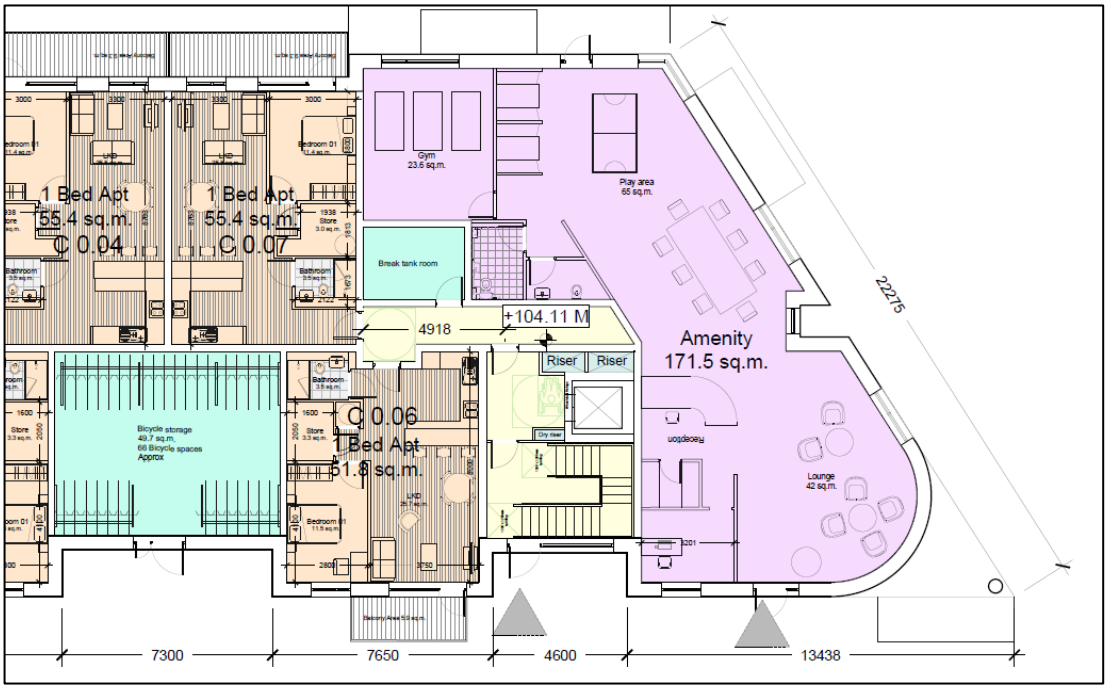


Figure 4.10: Residential Amenity Space [Drawing no WPE-JFA-XX-AB-DR-A-P2003, prepared by JFA]

4.4.1.8 Community Use

A 552 sq.m Community Building space will also be provided on the ground floor of Block A. The community use is proposed to satisfy the phasing requirements of the Ballycullen Oldcourt Local Area Plan. 2014. The space will provide adaptable multi-function rooms, meeting room, Kid's Room, a shared kitchen/lounge space, administration space and ancillary spaces.

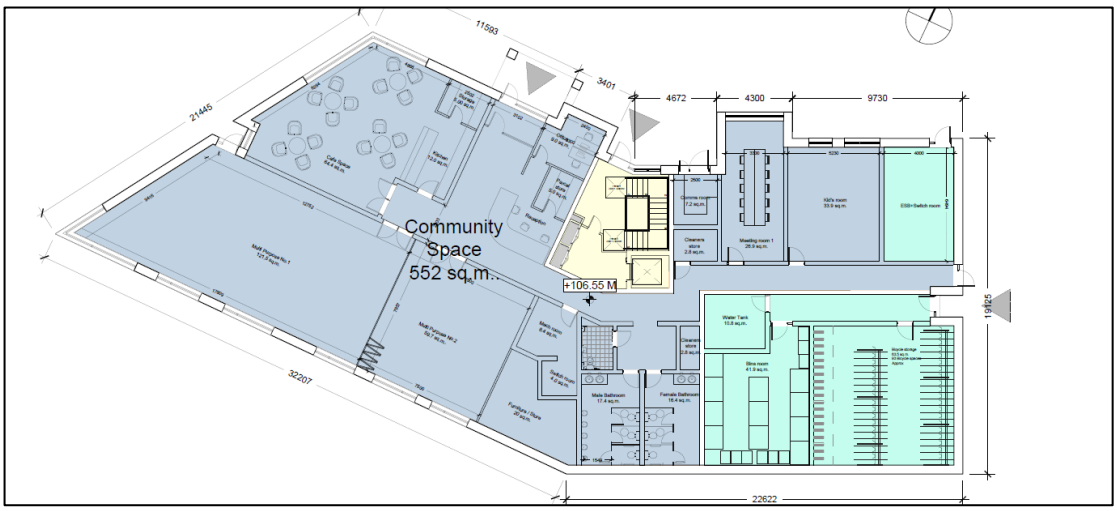


Figure 4.11: Block A Ground Floor Plan [Drawing no WPE-JFA-XX-AB-DR-A-P2001, prepared by JFA]

4.5 Alternative Mitigation Measures

The mitigation measures which are outlined in the various chapters of the EIAR are considered appropriate to the location, nature and extent of the project and its potential impacts. As such, no alterative mitigation measures were considered.

4.6 Conclusion

Having examined various reasonable alternative designs, it is considered that the proposed development is the preferred option in terms of the sustainable and appropriate development of the subject site.

5.0 ARCHAEOLOGY, ARCHITECTURAL & CULTURAL HERITAGE

5.1 Introduction

5.1.1 General

IAC Archaeology Ltd. has prepared this report on behalf of Ardstone Homes Limited to assess the impact, if any, on the archaeological, architectural, and cultural heritage resource of a proposed residential development at Stocking Avenue, Dublin 16 (Figures 5.1). The assessment was carried out by Grace Corbett of IAC Archaeology Ltd.

This study determines, as far as reasonably possible from existing records, the nature of the archaeological, architectural and cultural heritage resource in and within the vicinity of the proposed development, using appropriate methods of study. Desk-based assessment is defined as a programme of study of the historic environment within a specified area or site that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic, and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage assets (CIfA 2014). This leads to the following:

- Determining the presence of known archaeological, architectural and cultural heritage sites that may be affected by the proposed development;
- Assessment of the likelihood of finding previously unrecorded archaeological remains during the Construction Phase;
- Determining the impact upon the setting of known cultural heritage sites in the surrounding area; and
- Suggested mitigation measures based upon the results of the above research.

The study involved detailed interrogation of the archaeological, architectural and historical background of the proposed development area and its surrounding landscape. This included information from the Record of Monuments and Places of County Dublin, the County Development Plan, the topographical files of the National Museum of Ireland and cartographic and documentary records. A study area of 500m surrounding the proposed development area was used for the purposes of assessment. Inspection of the aerial photographic coverage held by the Ordnance Survey, Bing Maps and Google Earth has also been carried out. A field inspection has been carried out in an attempt to identify any known archaeological and cultural heritage sites and previously unrecorded features, structures and portable finds within the site.

An impact assessment and a mitigation strategy have been prepared. The impact assessment is undertaken to outline potential adverse impacts that the proposed development may have on the cultural heritage resource, while the mitigation strategy is designed to avoid, reduce or offset such adverse impacts.

5.1.2 The Development

The proposed development will comprise the construction of 241 no. residential units in a mix of 1 and 2 bed apartments, provided across 5 no. apartment blocks, ranging in height from 4-

6 storeys, and 3 no. three storey duplex blocks. The development will also provide associated residential amenity facilities and a community centre space.

The proposed development will also include hard and soft landscaping, boundary treatments, public lighting, ESB substations, plant and switch rooms, and residential waste facilities, piped site wide services, and all ancillary works and services necessary to facilitate construction and operation. The development will be served by a vehicular access from Stocking Avenue on the southern side of the site.

Please refer to Section 3.2.3 of the EIAR for a detailed description of the proposed development.

5.1.3 Definitions

In order to assess, distil and present the findings of this study, the following definitions apply: 'Cultural Heritage' where used generically, is an over-arching term applied to describe any combination of archaeological and cultural heritage features, where;

- the term 'archaeological heritage' is applied to objects, monuments, buildings or landscapes of an (assumed) age typically older than AD 1700 (and recorded as archaeological sites within the Record of Monuments and Places)
- the term 'architectural heritage' is applied to structures, buildings, their contents and settings of an (assumed) age typically younger than AD 1700; and
- the term 'cultural heritage', where used specifically, is applied to other (often less tangible) aspects of the landscape such as historical events, folklore memories and cultural associations. This designation can also accompany an archaeological or architectural designation.

5.2 Methodology

5.2.1 Paper Study

The following sources were examined and a list of areas of archaeological, architectural, and cultural heritage potential was compiled:

- Record of Monuments and Places for County Dublin;
- Sites and Monuments Record for County Dublin;
- Monuments in State Care Database;
- Preservation Orders;
- Register of Historic Monuments;
- Topographical files of the National Museum of Ireland;
- Cartographic and written sources relating to the study area;
- South Dublin County Development Plan 2017–2023;
- National Inventory of Architectural Heritage;
- Place name analysis;
- Aerial photographs; and
- Excavations Bulletin (1970-2019)

Record of Monuments and Places (RMP) is a list of archaeological sites known to the National Monuments Section, which are afforded legal protection under Section 12 of the 1994 National Monuments Act and are published as a record.

Sites and Monuments Record (SMR) holds documentary evidence and field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g. only a site type and townland are recorded. These are known to the National Monuments Section as 'un-located sites' and cannot be afforded legal protection due to lack of locational information. As a result, these are omitted from the Record of Monuments and Places. SMR sites are also listed on the website created by the Department of Culture, Heritage and the Gaeltacht (DoCHG) – www.archaeology.ie.

National Monuments in State Care Database is a list of all the National Monuments in State guardianship or ownership. Each is assigned a National Monument number whether in guardianship or ownership and has a brief description of the remains of each Monument. The Minister for the DoCHG may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

Preservation Orders List contains information on Preservation Orders and/or Temporary Preservation Orders, which have been assigned to a site or sites. Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

Register of Historic Monuments was established under Section 5 of the 1987 National Monuments Act, which requires the Minister to establish and maintain such a record. Historic monuments and archaeological areas present on the register are afforded statutory protection under the 1987 Act. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the Record of Monuments and Places.

The Topographical files of the National Museum of Ireland are the national archive of all known finds recorded by the National Museum. This archive relates primarily to artefacts but also includes references to monuments and unique records of previous excavations. The find spots of artefacts are important sources of information on the discovery of sites of archaeological significance.

Cartographic sources are important in tracing land use development within the development area as well as providing important topographical information on areas of archaeological potential and the development of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape.

- John Speed, Map of Dublin, 1610
- William Petty, Down Survey, Co. Dublin, Barony Map of Newcastle, 1655

- Bernard De Gomme, The city and suburbs of Dublin from Kilmainham to Ringsend..., 1673
- John Rocque, A Survey of the City, Harbour, Bay and Environs of Dublin on the same Scale as those of London, Paris & Rome, 1757
- William Faden, A plan of the City of Dublin, 1797
- William Wilson, Modern plan of the City and Environs of Dublin, 1798
- Thomas Campbell, City of Dublin, 1811
- John Taylor, Map of the environs of Dublin, extending 10 to 14 miles from the castle, 1816
- William Duncan, Map of the County of Dublin, 1821
- John Cooke, Royal map of Dublin, 1822
- Ordnance Survey maps of County Dublin 1837–1938

Documentary sources were consulted to gain background information on the archaeological and cultural heritage landscape of the proposed development area.

Aerial photographic coverage is an important source of information regarding the precise location of sites and their extent. It also provides initial information on the terrain and its likely potential for archaeology. A number of sources were consulted including aerial photographs held by the Geological Survey of Ireland, the Ordnance Survey and Google Earth.

Place Names are an important part in understanding both the archaeology and history of an area. Place names can be used for generations and in some cases have been found to have their root deep in the historical past.

Development Plans contain a catalogue of all the Protected Structures and archaeological sites within the county. The South Dublin County Development Plan 2016-2022 was consulted to obtain information on cultural heritage sites in and within the immediate vicinity of the proposed route. The Record of Protected Structures lists structures of architectural, cultural, scientific, historical or archaeological interest can be protected under the Planning and Development Act, 2000, where the conditions relating to the protection of the architectural heritage are set out in Part IV of the Act. This Act superseded the Local Government (Planning and Development) Act, 1999, and came into force on 1st January 2000.

The National Inventory of Architectural Heritage (NIAH) is a government-based organisation tasked with making a nationwide record of significant local, regional, national and international structures, which in turn provides county councils with a guide as to what structures to list within the Record of Protected Structures. The NIAH have also carried out a nationwide desk-based survey of historic gardens, including demesnes that surround large houses. This has also been completed for County Dublin and was examined in relation to the surviving demesnes within the surrounding area of the proposed development.

Excavations Bulletin is a summary publication that has been produced every year since 1970. This summarises every archaeological excavation that has taken place in Ireland during that year up until 2010 and since 1987 has been edited by Isabel Bennett. This information is vital when examining the archaeological content of any area, which may not have been recorded under the SMR and RMP files. This information is also available online (www.excavations.ie) from 1970–2019.

5.2.2 Field Inspection

Field inspection is necessary to determine the extent and nature of archaeological and architectural remains, and can also lead to the identification of previously unrecorded or suspected sites and portable finds through topographical observation and local information.

The archaeological and architectural field inspection was conducted from 27th March 2020 and entailed:

- Walking the proposed development area and its immediate environs;
- Noting and recording the terrain type and land usage;
- Noting and recording the presence of features of archaeological, architectural, or cultural heritage significance:
- Verifying the extent and condition of recorded sites: and
- Visually investigating any suspect landscape anomalies to determine the possibility of their being anthropogenic in origin.

5.2.3 Consultation

Following the initial research, a number of statutory and voluntary bodies were consulted to gain further insight into the cultural background of the background environment, receiving environment and study area, as follows:

- Department of Culture, Heritage and the Gaeltacht – the Heritage Service, National Monuments and Historic Properties Section: Record of Monuments and Places; Sites and Monuments Record; Monuments in State Care Database; Preservation Orders; Register of Historic Monuments; and the database of Irish excavation reports;
- National Museum of Ireland, Irish Antiquities Division: topographical files of Ireland;
- South Dublin Council: Planning Section.

5.2.4 Impact Assessment Methodology

For the purpose of this Impact Assessment, the impacts significance is defined in accordance with the EPA Guidelines on the Information to be Contained in Environmental Impact Statements (EPA, 2017).

- Negative Impact: A change which reduces the quality of the environment. For example: a change that will detract from or permanently remove an archaeological / architectural monument / structure from the landscape.
- Neutral Impact: No effects, or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
- Positive Impact: A change which improves the quality of the environment. For example: a change that improves or enhances the setting of an archaeological / architectural monument/structure.
- Direct Impact: Where an archaeological / architectural feature or site is physically located within the footprint of the proposed development and entails the removal of part, or all of the monument or feature.
- Indirect Impact: Where a feature or site of archaeological / architectural heritage merit or its setting is located in close proximity to the footprint of a potential route alignment.

It should be noted that whilst impact levels and definitions are applied consistently to the cultural heritage resource, direct impacts on sites that are subject to statutory protection are considered to be more significant than sites/ structures not subject to statutory protection.

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

Table 5.1: Effect definitions

5.2.5 Guidance and Legislation

The following legislation, standards and guidelines were consulted as part of this assessment.

- European Communities (EC) (Environmental Impact Assessment) (Amendment) Regulations 1999;
- National Monuments Acts 1930 (as amended);
- The Planning and Development Act 2000 (as amended);
- Heritage Act, 1995;
- Environmental Protection Agency (EPA) EPA Advice Notes on current practice in the preparation of Environmental Impact Statement (EIS) (EPA 2003) and draft revised notes (September 2015);
- EPA Guidelines on the Information to be contained in Environmental Impact Statement (EPA, 2002) and draft revised guidelines (August 2017);
- European Commission document 'Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report' (2017)
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht and the Islands;
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999; and
- Local Government (Planning and Development) Act 2000.

5.3 Description of Receiving Environment

The proposed development area is located on the north side of Stocking Avenue in the townland of Woodtown, Dublin 16, within the Parish of Cruagh and the Barony of Uppercross. The site is bordered by Stocking Avenue to the south, by residential developments to the east and west, and by the M50 to the north. A house, garden and associated outbuildings (Green Acres House) lie immediately adjacent to the east of the proposed development. The eastern

border of the proposed development area lies along the townland boundary separating Newtown and Woodtown.

There are no recorded monuments within a 500m radius of the proposed development. There two Protected Structures (also recorded by the NIAH), a gate lodge (RPS No. 335) c. 265m to the south associated with Woodtown Park/Manor and the Ballyboden Waterworks (RPS. No. 333) c.430m to the northeast (Figure 5.1).

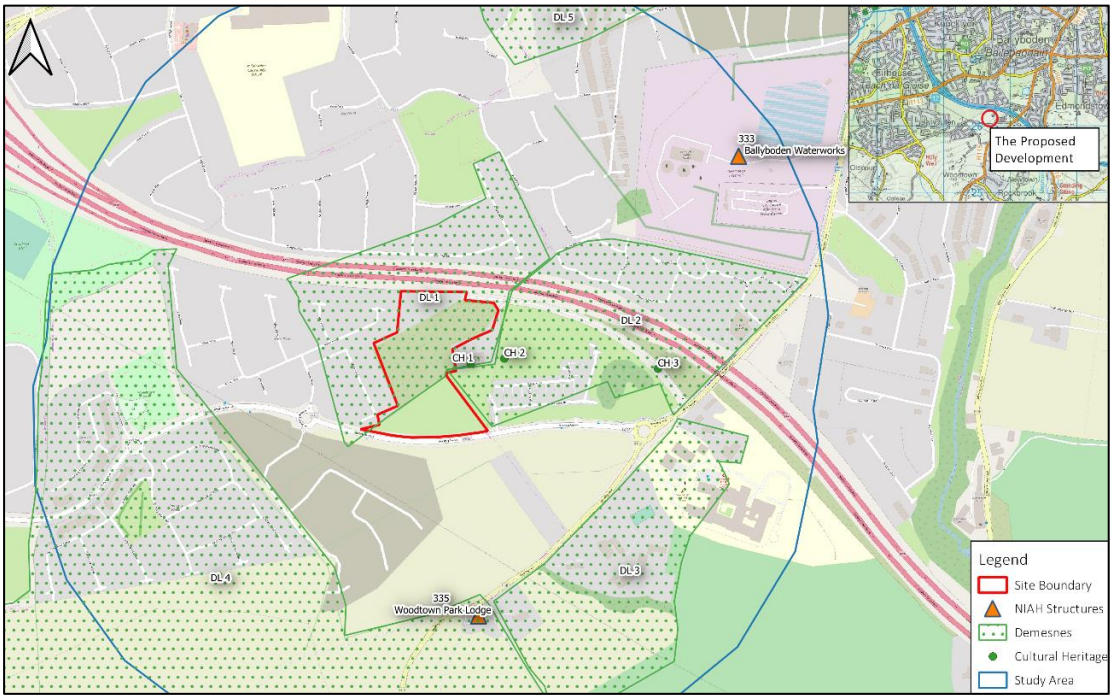


Figure 5.1: Site Location and surrounding protected structures, demesnes and cultural heritage sites

5.3.1 Archaeological and Historical Background

5.3.1.1 Prehistoric Period (8000 BC – AD 400)

Although very recent discoveries may push back the date of human activity by a number of millennia (Dowd and Carden, 2016), the Mesolithic period is the earliest time for which there is clear evidence for prehistoric activity in Ireland. During this period people hunted, foraged and gathered food and appear to have had a mobile lifestyle. The most common evidence found to show the presence of Mesolithic communities at a site consists of scatters of worked flint material, a by-product from the production of flint implements.

The current archaeological evidence suggests that the environs of the proposed development area was first inhabited towards the later part of this period. At this time people made crude flint tools known as Larnian (or Bann) Flakes. Small numbers of these flakes have been found along coastal areas of County Dublin such as Dun Laoghaire, Dalkey Island, and Loughlinstown and may indicate small-scale transient settlement along the riverbanks and seashores (Corlett, 1999). There are no known Mesolithic sites located within the vicinity of the proposed development area.

In the Neolithic period communities became less mobile and their economy became based on the rearing of stock and cereal cultivation. The transition to the Neolithic was marked by major social change, communities had expanded and moved further inland to more permanent

settlements and this enabled the development of agriculture. This in turn demanded an altering of the physical landscape, forests were rapidly cleared and field boundaries constructed. Pottery was also being produced, possibly for the first time. The advent of the Neolithic period also led to the appearance of the megalithic tomb. There are four types of megalithic tomb; court cairn, portal, passage and wedge. The court, portal and passage style tombs are exclusively of Neolithic date, while the wedge tomb straddles the Neolithic to Bronze Age transition.

While no megalithic tombs are recorded within 500m of the site, there are a number recorded in the wider landscape. A portal tomb (DU025-002) is recorded c. 1.3km south of the proposed development area, while a second portal tomb is located at Kilmashogue (DU025-006), c. 3km to the southeast. A wedge tomb (DU025-007001) is located c. 700m northeast of this, c. 2.9km southeast of the proposed development area. Two passage tombs (DU025-001001/2) are also recorded at Montpelier c. 2.6km to the southwest.

The Bronze Age was marked by the widespread use of metal for the first time in Ireland. As with the transition from Mesolithic to Neolithic, the transition into the early Bronze Age was accompanied by changes in society. Megalithic tombs were no longer constructed and the burial of the individual became typical. Cremated or inhumed bodies were often placed in a cist, which is a stone-lined grave usually built of slabs set upright to form a box-like construction and capped by a large slab, or several smaller lintels (Buckley & Sweetman, 1991). Barrows and pit burials are also funerary monuments associated with this period. A flat cemetery (three or more individual burials in cists or pits) is recorded (DU022-029) c. 1 km southeast of the proposed development. A cist burial was also discovered in 1927, possibly during gravel extraction, within a field c. 2.5 km to the southeast of the proposed development area, on the lower slopes of Tibradden Mountain (DU025-004). An enlarged food vessel was found in the pit whilst other sherds of pottery were found in the surrounding area.

The Bronze Age landscape is also defined by other monuments such as standing stones, stone rows and stone circles. A standing stone is recorded at Mountpelier (DU025-021) c. 2.5 km to the south-southwest, whilst a possible cursus (DU025-087) is located c. 1.8 km to the south-southwest of the proposed development area.

Another site type thought to reveal of glimpse of domestic life at this time is the burnt mound or fulacht fiadh. A common site within the archaeological record, they are normally interpreted as temporary cooking sites but may have been used for other industrial or even recreational functions and are likely to have been used on a seasonal basis. They survive as low mounds of charcoal-enriched soil mixed with an abundance of heat-shattered stones. They are usually horseshoe shaped and located in low-lying areas near a water source, often found in clusters. Even when levelled by an activity such as ploughing, they are identifiable as burnt spreads in the landscape. Radiocarbon dates for this monument type have generally placed them in the Bronze Age (Brindley & Lanting, 1990).

A number of fulachta fiadh and burnt spreads, along with possible Bronze Age habitation activity, have been recorded and excavated within the landscape surrounding the proposed development area. In 2004 advance works associated with the construction of Stocking Avenue identified the remains of possible fulachta fiadh or burnt mounds in areas immediately to the southwest of the proposed development area (Dehaene 2004, Licence Ref.: 04E0940).

Fulachta fiadh are also recorded c. 1.1km northwest (DU022-111) and c. 750m southeast (DU022-115) of the proposed development area. In 2004 a possible Bronze Age house and

associated features were excavated c. 1.25km west-southwest (Larsson 2003b, Licence Ref.: 02E0190) and a cremation pit and other features, such as kilns, were recorded to the north of this site in 2003 (Larsson 2004, Licence Ref.: 03E1474).

Perhaps the most significant Bronze Age item from the landscape surrounding the proposed development area consists of a gold dress fastener, which was recovered from spoil during construction works at Woodstown village in 1998, c. 850m west of the proposed development area (NMI 1998:70). This is a very rare item and its discovery is considered to be of national importance.

Compared to the rest of Irish prehistory there is relatively little evidence in Ireland, as a whole, representing the Iron Age. As in the rest of Europe, two phases of the Iron Age have been proposed in Ireland; the Hallstatt and the La Tène (Raftery, 1994). The Hallstatt period generally dates from 700BC onwards and spread rapidly from Austria, across Europe, and then into Ireland. The later Iron Age or La Tène culture also originated in Europe during the middle of the 5th century BC. This theory however has been challenged in recent years by John Koch and Barry Cunliffe, amongst others. Cunliffe has put forward an opposing theory suggesting that the Insular Celtic Cultures originated in Western Europe (Koch and Cunliffe, 2013). There is no firmly dated evidence for Iron Age activity within the vicinity of the proposed development area, although the remains of a house interpreted as possibly belonging to this period were excavated c. 1km west of the proposed development area in 2002 (Larsson 2002, Licence Ref.: 02E1373).

5.3.1.2 Early Medieval Period (AD500–1100)

The early medieval period is depicted in the surviving sources as entirely rural characterised by the basic territorial unit known as túath. Byrne (1973) estimates that there were probably at least 150 kings in Ireland at any given time during this period, each ruling over his own túath. One of the most common indicators of settlement during this period is the ringfort. Ringforts were often constructed to protect rural farmsteads and are usually defined as a broadly circular enclosure delineated by a bank and ditch. Ringforts can be divided into three broad categories – univallate sites, with one bank or ditch; multivallate sites with as many as four levels of enclosing features and platform or raised ringforts, where the interior of the ringfort has been built up. These enclosed farmsteads were intimately connected to the division of land and the status of the occupant.

Whilst the ringfort is one of the most common archaeological monuments found within the Irish landscape, none are recorded within the immediate vicinity of the proposed development area, the closest is DU022-020 located c. 900m to the northwest. It is likely that the area was relatively well settled during this period, especially when considering the proliferation of early ecclesiastical sites, however, it is possible that there was no need for a large number of defended settlements as the area was out of reach of the constant attention of the Kings of Meath to the north of Dublin city and the Kings of Leinster to the west of the Wicklow Mountains. It is also possible that the sites were removed during later periods or by the suburban development that occurred during the latter part of the 19th Century.

This period was characterised by the introduction of Christianity to Ireland. The new religion was a catalyst for many changes, one of the most important being literacy. Irish was written down for the first time using the ogham script. The ogham alphabet is thought to be based on the Latin alphabet of the later Roman Empire and today the majority of the inscriptions that survive are located on pillar stones or boulders. As well as this form of the written word, the

church created impressive tomes in their official language, Latin. Examples of these include the Book of Kells and the Book of Durrow as well as other mundane works such as the Annals, which were an account of the history of the church. Monasticism was known in St. Patrick's time (mid-5th century) but it was not until the 6th and 7th centuries that the famous monastic houses such as Glendalough, Bangor, Clonfert, Clonard, Clonmacnoise and Durrow were founded.

Whilst there are no recorded early ecclesiastical church sites located within the vicinity of the proposed development area, a holy well is recorded c. 1km southwest (RMP DU022-028, RPS 362). The veneration of holy wells is one of the oldest traditions in Irish Christianity and most likely has its origins in earlier pagan ritual activities. The well is dedicated to St. Columkille, who it is believed stopped here to quench his thirst whilst on a journey. The site is still venerated today. Legend states that the water from the well cannot be boiled, but is a good cure for problems with the eyes and throat. During the 19th century a granite cross (RPS 360) was erected close to the well, reputedly to ward off an illness that was affecting cattle in the area.

5.3.1.3 Medieval Period (AD1100–1600)

The beginning of the medieval period was characterised by political unrest that originated from the death of Brian Borumha in 1014. In 1171, Dublin was besieged and taken by Diarmait MacMurchadha and his Leinster forces supported by a force of Anglo-Norman knights led by Strongbow (Richard Fitz-Gilbert de Clare) and Raymond le Gros. Diarmait MacMurchadha, deposed King of Leinster, sought the support of mercenaries from England, Wales and Flanders to assist him in his challenge for kingship. Norman involvement in Ireland began in 1169, when Richard de Clare and his followers landed in Wexford to support MacMurchadha. Two years later de Clare (colloquially known as Strongbow) inherited the Kingdom of Leinster and by the end of the 12th century the Normans had succeeded in conquering much of the country (Stout & Stout, 1997). The initial stage of the invasion of the country was marked by the construction of Motte and Bailey castles, which were later replaced with stone fortifications.

The lands surrounding Knocklyon, Tallaght and Saggart were lands bordering the Dublin Mountains and during the relatively peaceful 13th century, these manors enjoyed a steady increase in revenues. From the 1270s onwards, the Gaelic Irish consolidated control of the upland areas and used these mountain holdings as launching pads for sustained raids into the lowland farms and manors. Raids continued into the 14th century and the area was further destabilised by the Bruce Invasion (1317) and subsequently by the advent of the Black Death (1348-9). By mid-century many tenants had left the area and the lands were designated as 'march' lands meaning liminal border lands between 'the land of peace' and 'the land of war' (Murphy and Potterton 2010). In 1320 Milo de Bret, who resided in Cork, leased part of the lands to his legal adviser, John Graunteste. His son, John le Bret, a sheriff of Cork, was ordered in 1356 to proceed to his manor of Rathfarnham with his followers fully armed, following an attack by the O'Byrnes (Corlett 1999).

The threat of attack from the Irish of the Dublin and Wicklow mountains was constant throughout the following centuries. The resultant political conditions precipitated the construction of a large amount of tower houses and fortified buildings within the South Dublin and Rathdown area. The closest tower house to the proposed development areas is located c. 1.6km to the northwest (DU022-019).

In 1993 a sherd of medieval pottery (NMI 1993:26) was retrieved from within the vicinity of the aforementioned holy well. The circumstance of the find is not recorded, however the identification of medieval pottery within topsoil is not uncommon as broken pottery was often thrown out into the fields along with other rubbish. Two possible medieval ditches were also identified during archaeological investigations c. 350m west of the proposed development (Dehaene 2004, Licence Ref.: 04E0940).

5.3.1.4 Post-Medieval Period (AD1600-1900)

Following the Gaelic Resurgence of the 14th and 15th centuries, the Tudor era saw a focused attempt to reconquer and pacify the entire country during the reigns of Henry VIII and Elizabeth I. The Elizabethan implementation of the 'Surrender and Regrant' policy allowed the monarch to continue colonising Ireland at a time when the treasury funds were too low to afford a war. The policy was to induce native leaders to put their lands under the protection and ultimate ownership of the crown. The implication was that if they did not, it would be taken away from them anyway. Under the Irish custom the clan itself owned the land, not any individual and this included the chief. He administered it during his lifetime but could not will any part of it on his death at which time it reverted to the charge of the tanaiste or appointed successor for the clan, not necessarily his son and heir.

The inducement was that on re-granting the chieftain would personally own the land and could will it in any way he desired, the aim of which was to break up the clan system and to put the lands and the owners within the control of the crown. However, the crown could take the land back at any time and this occurred frequently over the coming years. Confiscated lands were granted to 'undertakers' – suitable English people of the new faith who would undertake to purchase available land at a very low price on agreement that it would be sub-let exclusively to English Protestants. The nine years war waged by a confederation of Gaelic nobles, led by Hugh O'Neill, played out across the country at the end of the 16th century. The Dublin and Wicklow Mountains were during this time forested and impenetrable to the Tudor forces. The O'Byrne leaders of the Wicklow Mountains played an aggressive role throughout the war and the hinterland of Dublin and the landscape containing the proposed development area was subjected to many raids and attacks.

This unrest was followed in the second half of the 17th century by the Cromwellian Restoration and Williamite land settlements. Before 1641, the confiscation was aimed primarily against the Gaelic Irish, but after that date all Catholic proprietors, comprising mainly Irish and Old English, found their lands subject to forfeiture unless they could prove 'constant good affection' to the English parliament (Goff, 1987).

Following the pacification of the country in the late 17th century, a dramatic rise in the establishment of large residential houses occurred around the country. The large country house was only a small part of the overall estate of a large landowner and provided a base to manage often large areas of land that could be located nationwide. Lands associated with the large houses were generally turned over to formal gardens, which were much the style of continental Europe. During the mid-18th century this style of formal avenue and geometric garden design was gradually replaced by the adoption of parkland, or demesne, landscapes – allowing a large house to be viewed within a natural setting. Although the creation of a parkland landscape involved working with nature, rather than against it, considerable constructional effort went into their creation, earth was moved, field boundaries disappeared, streams were diverted to form lakes and quite often roads were completely diverted to avoid travelling anywhere near the main house or across the estate.

The proposed development area is located partially within the demesne landscape associated with Woodtown House/Manor (DL 1). This demesne landscape has been recorded by the NIAH garden survey which records that much of the demesne features are no longer present. The 1843 OS maps shows the House to the east of the proposed development area, with a formal garden to the west of this, within the site boundary. The demesne is confined to the northern half of the site, with the southern half occupying an agricultural field.

Four other demesne landscapes have been recorded within the study area. These include Airpark (DL 2), Spring Mount (DL 3), Woodtown House (DL 4) and Hayfield (DL 5). Airpark (DL 2) is located directly adjacent to the proposed development at its eastern side. The majority of this demesne has been altered as a result of the construction of the M50 and housing estates. Sprint Mount demesne (DL 3) is now occupied largely by three houses and part of a golf club. The demesne of Woodtown House (DL 4) covers a large area to the southwest of the proposed development area, with elements of the demesne surviving well save for the northern end which is now occupied by a modern housing estate.

5.3.2 Summary of Previous Archaeological Excavations

A review of the Excavations Bulletin (1970–2019) has shown that while no archaeological investigations have previously taken place within the proposed development area, several have been carried out within the 500m study area and are summarised below.

In 2004 archaeological monitoring and excavation took place along the path of Stocking Avenue immediately to the south of the proposed development area. Several areas of archaeological potential were identified (Dehaene 2004, Licence Ref.: 04E0940). Evidence for fulachta fiadh or burnt mound activity was identified in Area 3, c. 420m west-northwest of the proposed development, and Area 7 c. 60m to the east. Other areas excavated under this licence in the wider vicinity revealed further burnt mound activity, a pit-furnace and two possible medieval ditches.

An extensive programme of archaeological monitoring and excavation was carried out in 1998 in advance of a housing development adjacent to the south and east of the Brehon's Chair portal tomb, Taylorsgrange, Rathfarnham, c. 470m northeast of the proposed development area. The excavations revealed evidence of Neolithic, Beaker, Early Bronze Age, Iron Age and Early Christian activity in the form of hearths, post-holes and pits (Lynch 1998, Licence Ref.: 96E0091). Archaeological excavations of the tomb itself and its immediate area were carried out between 1984 and 1987 in advance of construction of the Southern Cross Motorway, revealing associated features, ranging in date from the Neolithic period to the early Bronze Age. The excavations also established that the tomb had contained burials.

The following archaeological investigations did not identify anything of archaeological significance within the study area of the proposed development; 98E0076 (Bennett 1998:119), 98E0077 (Bennett 1998:119), 98E0078 (Bennett 1998:223).

5.3.3 Cartographic Sources

William Petty's Down Survey Map, Barony of Newcastle & Uppercross, 1656-58
No detail is provided of the landscape containing the proposed development area, which is marked as 'Unforfieted Lands'

John Rocque's Map of County Dublin, 1760 (Figure 5.2)

The proposed development area is shown as being located within the corner of an open field, the eastern and northern boundaries of the proposed development area appear to correspond closely to the boundaries shown on the map. Stocking Lane is shown to the southeast, though not labelled as such, the area to the northeast is labelled as 'Hide Park' with a house seen to the east of the site. Woodtown House to the south is not present, although Mount Pleasant (later Mount Venus) is present. Oldcourt House is also marked to the west.

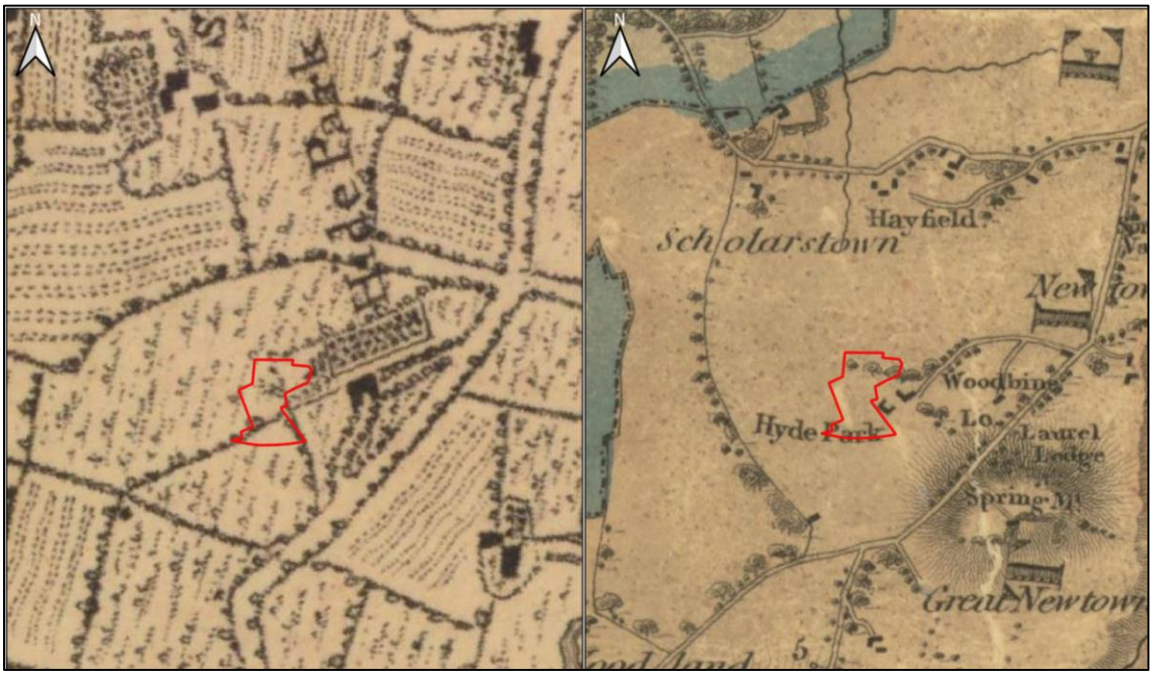


Figure 5.2: Extracts from John Rocque's Map (1760) and Duncan's Map (1821) showing the proposed development area

John Taylor's Map of the Environs of Dublin, 1816

By the time of this map the proposed development area is shown in open land, planted with trees, possibly associated with Hide Park, which is still marked immediately to the northeast. Two buildings are marked, one east of the proposed development, in the area now occupied by a row of residential properties. The second is shown immediately east of the proposed development, which is now occupied by Green Acres House. The houses and associated demesne landscape can be seen on this map, including Woodtown to the south and Spring Mount to the southwest.

William Duncan's Map of the County of Dublin, 1821 (Figure 5.2)

The proposed development area is shown in an open area now clearly labelled as 'Hyde Park'. The building to the east appears to have been realigned and a slight change has been made to the layout of the building further to the east, which also now has a driveway leading to it from Stocking Lane. Woodtown House is shown for the first time, with its driveway leading from Stocking Lane (as present-day) and labelled 'Woodland', the Woodtown Park buildings are shown as 'Woodtown'. A house labelled 'Spring M.' is shown on the east side of Stocking Lane, c. 250m south-southeast of the proposed development. A curving tree-lined boundary (possibly the limit of Hyde Park) is shown to the west of the proposed development area, and corresponds to a present-day boundary.

First Edition Ordnance Survey Map, 1837, scale 1:10,560 (Figure 5.3)

This is the first detailed mapping of the landscape containing the proposed development area, which is shown as crossing two fields and a garden. Hyde Park is no longer marked, however the building to the immediate east appears expanded and is now labelled as 'Woodtown Lodge', a formal garden associated with the lodge is located within the centre of the proposed development. Woodtown Park/Manor to the south and southeast is shown with its demesne landscape in detail, including the surviving gate lodge (RPS. No. 335) c. 265m to the south of the proposed development. A number of gate lodges are marked along the route of Stocking Lane, leading to various houses (including Woodtown Lodge). The closest of these is c.200m south-southeast of the area now occupied by the proposed development and appears to be associated with the house now labelled 'Spring Mount'. The house previously marked 'Woodbine Lo.' is now marked as 'Airpark' and has its own driveway and gate lodge.

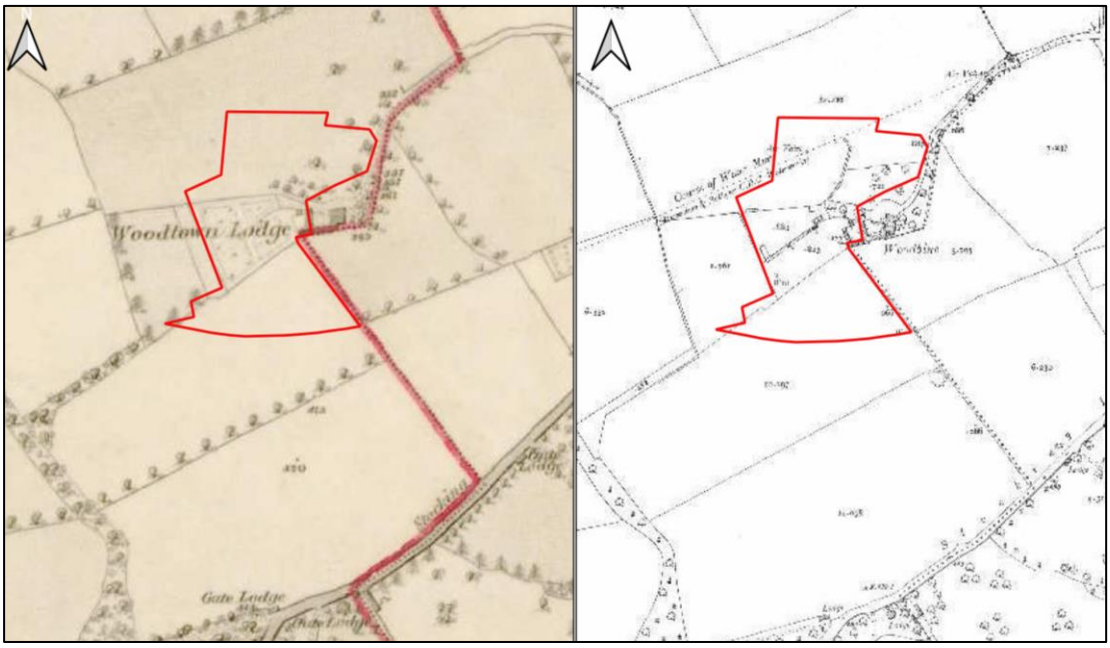


Figure 5.3: Extracts from Ordnance Survey Maps, 1843 (left) and 1906-9 (right) showing the proposed development area

Third Edition Ordnance Survey Map, 1907/9, scale 1:10,560 (Figure 5.3)
The proposed development area itself is unchanged from the previous mapping, although Woodtown Lodge, immediately to the east appears to have been extended again, and is now marked 'Woodbine'. Small ancillary structures and a well associated with this house are shown within the former formal garden, within the centre of the proposed development area. The course of a water main is illustrated crossing northern field within the site from southwest to northeast.

5.3.4 Development Plan

The South Dublin County Development Plan (2016–2022) and Ballycullen-Oldcourt LAP (2014, extended to 2024) recognise the statutory protection afforded to all RMP sites under the National Monuments Legislation (1930–2014). The county development plan lists a number of aims and objectives in relation to archaeological heritage (Appendix 3). The LAP, which covers the proposed residential development area only, states:

> *"5.3.5 Historic Features and Archaeology*
> *Archaeological and historic features should be preserved in-situ and sensitively incorporated into development including newly discovered and upstanding features.*

Views of Montpellier Hill and historic structures including the Hellfire Club, Woodtown Manor, Carthy's Castle and Orlagh House shall also be preserved and enhanced" (pg 26).

There are no recorded monuments within a 500m radius of the proposed development.

There two Protected Structures (also recorded by the NIAH), a gate lodge (RPS No. 335) c. 265m to the south associated with Woodtown Park/Manor and the Ballyboden Waterworks (RPS. No. 333) c.430m to the northeast.

5.3.6 Cultural Heritage

5.3.6.1 Place Name Analysis and Townlands

Townland and topographic names are an invaluable source of information on topography, land ownership and land use within the landscape. They also provide information on history; archaeological monuments and folklore of an area. A place name may refer to a long-forgotten site, and may indicate the possibility that the remains of certain sites may still survive below the ground surface. The Ordnance Survey surveyors wrote down townland names in the 1830's and 1840's, when the entire country was mapped for the first time. Some of the townland names in the study area are of Irish origin and through time have been anglicised. The main reference used for the place name analysis is Irish Local Names Explained by P.W Joyce (1870). A description and possible explanation of each townland name in the environs of the proposed route are provided in the table below.

A review of the place names surrounding the proposed development has revealed that the areas largely derive their names from their original Irish names. The possible derivation of Stocking Lane form 'Stump Lane', combined with the townland name of Woodtown, suggests that the area may have been forested at some point prior to the production of the earliest available mapping. It is also possible to translate Baile Uí Chuilinn (Ballycullen) as 'Hollytown', though this may be derived from a local family name rather than a stand of holly trees. The townland boundary between Woodtown and Newtown runs along the eastern border of the proposed development area.

Name	Derivation	Possible meaning
Woodtown	*Baile na Coille*	*Baile;* town/townland/homestead, *Coille;* wood
Stocking Lane	*Lána Stoicín*	*Stoicín;* stakes or stumps. 'Stump Lane'.
Newtown	-	-
Scholarstown	*Baile Scallart*	*Baile;* town/townland/homestead, *Scallart;* scallop
Ballycullen	*Baile Uí Chuilinn*	*Baile;* town/townland/homestead, *Uí Chuilinn;* a family name, *Chuilinn* also translates as 'holly'.
Uppercross	*An Chrois Uachterach*	*Chrois;* cross or crossroads, *Uachterach;* Upper
Dublin	*Baile Átha Cliath*	Ford of the hurdles

Table 5.2: Place name analysis

5.3.6.3 Cultural Heritage Sites

The term 'cultural heritage' can be used as an over-arching term that can be applied to both archaeology and architecture. However, it also refers to more ephemeral aspects of the environment, which are often recorded in folk law or tradition or possibly date to a more recent period. Green Acres House (CH 1), whilst not listed on the NIAH, appears to consist of parts of the original structure of a building shown on historic mapping since the eighteenth century. It is also possible that remains of the original Woodbine Lodge (CH 2), shown on Duncans 1821 map and on the earlier (1816) Taylor map (though the position is slightly different), survive beneath the surface to the east of the proposed development, though heavy disturbance would have resulted from the construction of the residential properties in the same area. The same is true of an unnamed building (CH 3) marked in the same area on Roques and Taylors maps, as well as landscape features associated with 'Hide/Hyde Park'.

The demesnes landscape which have been identified across the study area (Figure 5.1; Table 5.3) are considered cultural heritage assets.

DL No.	NIAH Ref.	Name	Description
DL 1	2312	Woodtown Lodge	Development has occurred across much of the demesne, with the proposed development area being the last remaining greenfield element of the demesne.
DL 2	n/a	Airfield	Development has occurred across much of the demesne, with the only surviving greenfield element of the demesne located south of the M50
DL 3	2320	Springmount	Significant development has taken place across this demesne, which is now divided in to four properties. Some original planting remains.
DL 4	2311	Woodtown House	This demesne survives largely in tact save to the very northern end which is now occupied by a housing estate.
DL 5	2319	Hayfield	Demesne largely occupied by modern housing save for central area where mature trees remains

Table 5.3: Demesne landscapes within the study area

5.3.7 Aerial Photography

Inspection of the aerial photographic coverage of the proposed development area held by the Ordnance Survey (1995-2013), Google Earth (2003-2018), and Bing Maps (2018) did not reveal any previously unknown archaeological features.

The aerial photographic coverage does indicate that the proposed development area has been subject to some disturbance associated with the construction of Stocking Avenue, though this appears to have been relatively superficial. This is visible on the coverage dating to 2005.

Green Acres House (CH 1), to the immediate east of the proposed development, occupies the site of a house visible on historic mapping from 1816 onwards in various layouts, named initially as Woodtown Lodge and later as Woodbine. Green Acres House consists of a portion of the house previously marked as Woodbine, with other sections removed and ancillary structures added.

The vicinity of the proposed development has been subject to extensive development. Aerial imagery from 2000 shows disturbance to the northern end of the site during the construction of the M50 motorway, as well as a yard area at the centre of the site (Plate 5.1). The construction of Stocking Avenue in 2005, which separated the proposed development area from the remainder of the field of which it was formally a part, also impacted on the southern end of the site (Plate 5.2).



Plate 5.1: 2000 Ordnance Survey image showing disturbance at the north and centre of the site (Ordnance Survey Ireland)



Plate 5.2: 2005 Ordnance Survey image showing disturbance at the southern end of the site (Ordnance Survey Ireland)

A row of residential properties (Stocking Hill) appears adjacent to the proposed development to the east around this time. A larger residential development (White Pines) was constructed to the northwest in 2018/19, and another is under construction to the southwest at the time of writing.

5.3.8 Field Inspection

The site is bound to the south by a roadway, the north by the M50, to the east by an area of scrubland Green Acres House and to the west by housing developments. The site comprises some disturbance and portions of unoccupied greenfield, which slopes to the northwest (Plate 5.3-4). Mature trees and hedgerow line the boundary to the northeast and northwest and a large concentration of gorse is located in the east corner. The eastern boundary of the site is the townland boundary between Woodstown and Newtown.



Plate 5.3: Southern end of the site, facing east



Plate 5.4: Southern end of the site, facing northwest

The central part of the site is occupied by overgrown hard standing, while the northern end of the site is occupied by scrub land and a disturbed area associated with the adjacent development to the west.

5.3.9 Topographical Files

One collection of artefacts has been recorded within 1km of the proposed development area. Food vessels, pygmy cups, stone beads, and flint artefacts were recovered c. 900m east of the site in 1951 (NMI Ref.: 1951:7-44).

5.3.10 Conclusions

The proposed development area occupies an area on the north side of Stocking Avenue in the townland of Woodtown, Dublin 16, within the Parish of Cruagh and the Barony of Uppercross. A house, garden and associated outbuildings (Green Acres House) lie immediately adjacent to the east of the proposed development. The eastern border of the proposed development lies along the townland boundary separating Newtown and Woodtown.

There are no recorded monuments within a 500m radius of the proposed development area. There two Protected Structures (also recorded by the NIAH), a gate lodge (RPS No. 335) c. 265m to the south associated with Woodtown Park/Manor and the Ballyboden Waterworks (RPS. No. 333), c.430m to the northeast

A review of the Excavations Bulletin (1970–2019) has shown that while no archaeological investigations have previously taken place within the proposed development area, several have been carried out within the 500m study area (three of which did not identify any archaeological deposits or features). Extensive archaeological investigations have taken place in association with the construction of Stocking Avenue and residential developments adjacent to, and in the wider vicinity of, the proposed development area. A number of small archaeological sites were identified, including a possible Bronze Age structure.

From the 18th century onwards the proposed development area appears relatively unchanged, shown as occupying open land within an area marked as Hide/Hyde Park until the mid-19th century, after which this park is no longer marked and the area is shown corresponding to its present-day field boundaries. The proposed development area is located partially within the demesne landscape associated with Woodtown Lodge (DL 1). This demesne landscape has been recorded by the NIAH garden survey which records that much of the demesne features are no longer present. The 1843 OS maps shows the house (CH 1) to the east of the proposed development area, with a formal garden to the west of this, within the site boundary. The demesne is confined to the northern half of the site, with the southern half occupying an agricultural field.

An inspection of the aerial photographic coverage did not reveal any previously unknown archaeological features, but did indicate that the proposed development area has been subject to some disturbance associated with the construction of Stocking Avenue, an area of hard standing at the centre of the site, and disturbance at the northern end of the site as a result of the construction of the M50.

5.4 Description of Potential Impacts

5.4.1 Construction Phase Impact

5.4.1.1 Archaeology

There are no predicted impacts to any known archaeological remains or recorded monuments during the construction phase of the proposed development.

It is possible that previously unrecorded archaeological features may be located beneath the current ground level, which survive with no surface expression. Ground disturbances associated with the development may have a direct and negative impact on any such remains. Prior to the application of mitigation, impacts on any such remains may range from moderate to significant in significance.

5.4.1.2 Architecture

There are no predicted impacts to any known architectural heritage assets during the construction phase of the proposed development.

5.4.1.3 Cultural Heritage

The construction of the proposed development will result in a direct slight negative impact on the remaining elements of Woodtown Lodge demesne (D 1).

5.4.2 Operational Phase Impact

There are no predicted impacts to any archaeological, architectural or cultural heritage assets during the operation of the proposed development.

5.4.3 Do Nothing Impact

If the proposed development were not to proceed there would be no negative impact on the archaeological, architectural or cultural heritage resource.

5.4.4 Worst Case Impact

In the event that the development proceeds without cultural heritage mitigation in place, it is possible that features of archaeological potential would be destroyed without proper record.

5.5 Mitigation Measures

All topsoil stripping outside of the areas of previous disturbance will be monitored by a suitably qualified archaeologist. Full provision will be made for the resolution of any archaeological features/deposits that may be discovered, should that be deemed the appropriate way to proceed.

A written and photographic record of the surviving elements of Woodtown Lodge demesne (DL 1) will be carried out prior to the construction of the proposed development.

5.5.1 Monitoring

The mitigation measures recommended above would also function as a monitoring system to allow the further assessment of the scale of the predicted impacts and the effectiveness of the recommended mitigation measures.

5.6 Cumulative Impacts

A number of developments, both proposed and those granted permission, in the surrounding area have been considered in the assessment of cumulative impacts.

There are no predicted cumulative impacts to the archaeological or cultural heritage resource. Should any archaeological or cultural heritage remains be identified on the site, they will be preserved by record, mitigating any negative impacts and adding to the understanding of the historical development of this area. Where proposed and granted developments in the surrounding area have the potential to impact on archaeological remains, it is highly likely that mitigation measures have also been proposed to preserve by record any identified archaeological remains.

5.7 Residual Impacts

Following the implementation of the above mitigation measures, there would be no residual impacts on the archaeological, architectural or cultural heritage resource.

5.8 REFERENCES

5.8.1 Bibliography

- Ballycullen-Oldcourt Local Area Plan 2014
- Bennett, I. (ed.) 1987–2010 Excavations: Summary Accounts of Archaeological Excavations in Ireland. Bray. Wordwell.
- Brindley, A. L., and Lanting, J. N. 1990. "The dating of fulachta fiadh." Burnt Offerings. International contributions to burnt mound archaeology, 55-56.
- Buckley, V. and Sweetman, P.D. 1991. Archaeological Survey of County Louth. Dublin.
- Byrne, F. J., 2001. Irish kings and high-kings. Four Courts Press.
- Chartered Institute for Archaeologists 2014a Standards & Guidance for Field Evaluation.
- Chartered Institute for Archaeologists 2014b Standards & Guidance for Archaeological Excavation.
- Chartered Institute for Archaeologists 2014c Standards & Guidance for an Archaeological Watching Brief (Monitoring).
- Corlett, C. 1999. Antiquities of Old Rathdown: The Archaeology of South County Dublin and North County Wicklow. Bray. Wordwell.
- Culleton E. (ed.) 1999 Treasures of The Landscape; Townland Names by An Tathair Seamas S. De Vaal Dublin: Trinity College.
- De Courcy, J.W. 1996 The Liffey in Dublin Gill & Macmillan, Dublin
- Department of Arts, Heritage, Gaeltacht and the Islands. 1999a Framework and Principles for the Protection of the Archaeological Heritage. Dublin. Government Publications Office.
- Department of Arts, Heritage, Gaeltacht and the Islands. 1999b Policy and Guidelines on Archaeological Excavation. Dublin. Government Publications Office.
- Dowd, M., Carden, R., 2016. 'First evidence of a Late Upper Palaeolithic human presence in Ireland.' Quaternary Science Reviews 139: 158-163.
- Environmental Protection Agency. 2015 Draft Advice Notes on Current Practice (in the preparation of Environmental Impact Statements). Dublin. Government Publications Office.
- Environmental Protection Agency. 2017 Draft Guidelines on the Information to be Contained in Environmental Impact Statements. Dublin. Government Publications Office.
- Goff, H 1987 'English Conquest of an Irish Barony: the changing patterns of land ownership in the Barony of Scarawalsh 1540-1640' in Whelan, K (ed) Wexford: History and Society Geography Publications: Dublin.
- Joyce, P. W. 1870. Irish Local Names Explained. Sydney: Wentworth Press.
- Koch, J. T., and. Cunliffe, B. W. 2013 (eds). Celtic from the West 2: Rethinking the Bronze Age And the Arrival of Indo-European in Atlantic Europe. Oxbow.
- McErlean, T. 1983 "The Irish townland system of landscape organisation". In Reeves-Smyth, Terence; Hamond, Fred (eds) Landscape Archaeology in Ireland BAR British Series 116. pp. 315–39.
- National Monuments Service, Department of Culture, Heritage and the Gaeltacht. Sites and Monuments Record, County Dublin.
- National Museum of Ireland. Topographical Files, County Dublin.
- Raftery, B. 1994. Pagan Celtic Ireland: the enigma of the Irish Iron age. Thames and Hudson.
- Stout, G. and Stout, M. 1997 Early Landscapes: from Prehistory to Plantation. In F.H.A. Aalen et. al. (eds), Atlas of the Irish Rural Landscape. Cork. Cork University Press.
- South Dublin County Development Plan (2016–2022)

5.8.2 Cartographic Sources

- John Speed, Map of Dublin, 1610
- William Petty, Down Survey, Co. Dublin, Barony Map of Newcastle, 1655
- Bernard De Gomme, The city and suburbs of Dublin from Kilmainham to Ringsend..., 1673
- John Rocque, A Survey of the City, Harbour, Bay and Environs of Dublin on the same Scale as those of London, Paris & Rome, 1757
- William Faden, A plan of the City of Dublin, 1797
- William Wilson, Modern plan of the City and Environs of Dublin, 1798
- Thomas Campbell, City of Dublin, 1811
- John Taylor, Map of the environs of Dublin, extending 10 to 14 miles from the castle, 1816
- William Duncan, Map of the County of Dublin, 1821
- John Cooke, Royal map of Dublin, 1822
- Ordnance Survey maps of County Dublin 1837–1938

5.8.3 Web References

- www.childrenshomes.org.uk
- www.excavations.ie – Summary of archaeological excavation from 1970-2019.
- www.archaeology.ie – DoCHG website listing all SMR sites.
- www.osiemaps.ie – Ordnance Survey aerial photographs dating to 1995-2013 and 6-inch/25-inch OS maps.
- www.heritagemaps.ie – The Heritage Council web-based spatial data viewer which focuses on the built, cultural and natural heritage.
- www.googleearth.com – Satellite imagery of the proposed development area.
- www.bingmaps.com – Satellite imagery of the proposed development area.
- www.booksulster.com/library/plnm/placenamesC.php - Contains the text from Irish Local Names Explained by P.W Joyce (1870).
- www.logainm.ie –Placenames Database of Ireland launched by Fiontar agus Scoil na Gaelige and the DoCHG.

A5.1 APPENDIX 5.1: PROTECTED STRUCTURES WITHIN THE STUDY AREA

RPS NO.	333
NIAH NO.	11216048
RMP	N/A
LOCATION	Stocking Lane
BARONY	Uppercross
CLASSIFICATION	Reservoir and water treatment works
DIST. TO DEVELOPMENT	430m northeast
DESCRIPTION	Reservoir and water treatment works, established 1883, taking water from the Glenasmole Reservoirs upstream. Stone-lined reservoir and single-storey coursed rubble granite valve buildings, formerly supplied by sand filtration beds, now decommissioned but in-situ, including sluices. Replaced by rapid gravity filtration plant, c.1955, with associated two-storey flat-roofed building. Smooth rendered walls, casement windows and glazed timber door having glass block sidelights and decorative roundel above. Retains some interior features.
REFERENCE	www.buildingsofireland.ie

RPS NO.	335
NIAH NO.	11221002
RMP	N/A
LOCATION	Stocking Lane
BARONY	Uppercorss
CLASSIFICATION	Woodtown Park Lodge
DIST. TO DEVELOPMENT	275m south
DESCRIPTION	Detached three-bay single-storey classical style gate lodge, c.1830, with shallow central pedimented breakfront. Refurbished and extended, c.1990. Rendered, ruled and lined walls with granite entablature. Square granite columns to corners of original building. Granite pediment and columns to breakfront. Replacement timber sash windows. Replacement timber panelled door. Hipped slate roof with central rendered chimney stack. Extension to rere in a similar style. Set inside entrance screen comprising cast-iron gates and gate posts, flanking stone piers and rendered walls. This classical gate lodge and entrance screen present a most attractive appearance on approach, announcing the style of the main house beyond. Though refurbished, the lodge retains its

	original proportions, carried through in the more simply executed rear wing.
REFERENCE	www.buildingsofireland.ie

A5.2 APPENDIX 5.2: LEGISLATION PROTECTING THE ARCHAEOLOGICAL RESOURCE

Protection of Cultural Heritage

The cultural heritage in Ireland is safeguarded through national and international policy designed to secure the protection of the cultural heritage resource to the fullest possible extent (Department of Arts, Heritage, Gaeltacht and the Islands 1999, 35). This is undertaken in accordance with the provisions of the European Convention on the Protection of the Archaeological Heritage (Valletta Convention), ratified by Ireland in 1997.

The Archaeological Resource

The National Monuments Act 1930 to 2014 and relevant provisions of the National Cultural Institutions Act 1997 are the primary means of ensuring the satisfactory protection of archaeological remains, which includes all man-made structures of whatever form or date except buildings habitually used for ecclesiastical purposes. A National Monument is described as 'a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto' (National Monuments Act 1930 Section 2). A number of mechanisms under the National Monuments Act are applied to secure the protection of archaeological monuments. These include the Register of Historic Monuments, the Record of Monuments and Places, and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

Ownership and Guardianship Of National Monuments

The Minister may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

Register of Historic Monuments

Section 5 of the 1987 Act requires the Minister to establish and maintain a Register of Historic Monuments. Historic monuments and archaeological areas present on the register are afforded statutory protection under the 1987 Act. Any interference with sites recorded on the register is illegal without the permission of the Minister. Two months' notice in writing is required prior to any work being undertaken on or in the vicinity of a registered monument. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the Record of Monuments and Places.

Preservation Orders and Temporary Preservation Orders

Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

Record of Monuments And Places

Section 12(1) of the 1994 Act requires the Minister for Arts, Heritage, Gaeltacht and the Islands (now the Minister for the Department of Culture, Heritage and the Gaeltacht) to establish and maintain a record of monuments and places where the Minister believes that such monuments exist. The record

comprises a list of monuments and relevant places and a map/s showing each monument and relevant place in respect of each county in the state. All sites recorded on the Record of Monuments and Places receive statutory protection under the National Monuments Act 1994. All recorded monuments on the proposed development site are represented on the accompanying maps.

Section 12(3) of the 1994 Act provides that 'where the owner or occupier (other than the Minister for Arts, Heritage, Gaeltacht and the Islands) of a monument or place included in the Record, or any other person, proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such a monument or place, he or she shall give notice in writing to the Minister of Arts, Heritage, Gaeltacht and the Islands to carry out work and shall not, except in case of urgent necessity and with the consent of the Minister, commence the work until two months after giving of notice'.

Under the National Monuments (Amendment) Act 2004, anyone who demolishes or in any way interferes with a recorded site is liable to a fine not exceeding €3,000 or imprisonment for up to 6 months. On summary conviction and on conviction of indictment, a fine not exceeding €10,000 or imprisonment for up to 5 years is the penalty. In addition, they are liable for costs for the repair of the damage caused.

In addition to this, under the European Communities (Environmental Impact Assessment) Regulations 1989, Environmental Impact Statements (EIS) are required for various classes and sizes of development project to assess the impact the proposed development will have on the existing environment, which includes the cultural, archaeological and built heritage resources. These document's recommendations are typically incorporated into the conditions under which the proposed development must proceed, and thus offer an additional layer of protection for monuments which have not been listed on the RMP.

The Planning and Development Act 2000

Under planning legislation, each local authority is obliged to draw up a Development Plan setting out their aims and policies with regard to the growth of the area over a five-year period. They cover a range of issues including archaeology and built heritage, setting out their policies and objectives with regard to the protection and enhancement of both. These policies can vary from county to county. The Planning and Development Act 2000 recognises that proper planning and sustainable development includes the protection of the archaeological heritage. Conditions relating to archaeology may be attached to individual planning permissions.

South Dublin Council Development Plan 2016-2022

Heritage, Conservation & Landscapes (HCL) Policy 1 Overarching

> *"It is the policy of the Council to protect, conserve and enhance natural, built and cultural heritage features, and to support the objectives and actions of the County Heritage Plan. "*

HCL1 Objective 1

> *"To protect, conserve and enhance natural, built and cultural heritage features and restrict development that would have a significant negative impact on these assets."*

HCL1 Objective 2

> *"To support the objectives and actions of the County Heritage Plan, including the preparation of a County Biodiversity Plan. "*

Heritage, Conservation & Landscapes (HCL) Policy 2 Archaeological Heritage

"It is the policy of the Council to manage development in a manner that protects and conserves the Archaeological Heritage of the County and avoids adverse impacts on sites, monuments, features or objects of significant historical or archaeological interest."

HCL2 Objective 1

"To favour the preservation in-situ of all sites, monuments and features of significant historical or archaeological interest in accordance with the recommendations of the Framework and Principles for the Protection of Archaeological Heritage, DAHGI (1999), or any superseding national policy document."

HCL2 Objective 2

"To ensure that development is designed to avoid impacting on archaeological heritage that is of significant interest including previously unknown sites, features and objects."

HCL2 Objective 3

"To protect and enhance sites listed in the Record of Monuments and Places and ensure that development in the vicinity of a Recorded Monument or Area of Archaeological Potential does not detract from the setting of the site, monument, feature or object and is sited and designed appropriately."

HCL2 Objective 4

"To protect and preserve the archaeological value of underwater archaeological sites including associated features and any discovered battlefield sites of significant archaeological potential within the County."

Heritage, Conservation & Landscapes (HCL) Policy 6 Features of Interest

"It is the policy of the Council to secure the identification, protection and conservation of historic items and features of interest throughout the County including street furniture, surface finishes, roadside installations, items of industrial heritage and other stand alone features of interest."

HCL 6 Objective 1

"To ensure that development within the County including Council development seeks to retain, refurbish and incorporate historic items and features of interest."

HCL 6 Objective 2

"To protect, preserve and maintain industrial heritage features including weirs, millraces, and mills along the River Dodder and River Liffey."

A5.3 APPENDIX 5.3: LEGISLATION PROTECTING THE ARCHITECTURAL RESOURCE

The main laws protecting the built heritage are the Architectural Heritage (National Inventory) and National Monuments (Miscellaneous Provisions) Act 1999 and the Local Government (Planning and Development) Acts 1963–1999, which has now been superseded by the Planning and Development Act, 2000. The Architectural Heritage Act requires the Minister to establish a survey to identify, record and assess the architectural heritage of the country. The background to this legislation derives from Article 2 of the 1985 Convention for the Protection of Architectural Heritage (Granada Convention). This states that:

For the purpose of precise identification of the monuments, groups of structures and sites to be protected, each member state will undertake to maintain inventories of that architectural heritage.

The National Inventory of Architectural Heritage (NIAH) was established in 1990 to fulfil Ireland's obligation under the Granada Convention, through the establishment and maintenance of a central record, documenting and evaluating the architecture of Ireland (NIAH Handbook 2005:2). As inclusion in the inventory does not provide statutory protection, the survey information is used in conjunction with the Architectural Heritage Protection Guidelines for Planning Authorities to advise local authorities on compilation of a Record of Protected Structures as required by the Planning and Development Act, 2000.

Protection Under the Record Of Protected Structures And County Development Plan

Structures of architectural, cultural, social, scientific, historical, technical or archaeological interest can be protected under the Planning and Development Act, 2000, where the conditions relating to the protection of the architectural heritage are set out in Part IV of the act. This act superseded the Local Government (Planning and Development) Act, 1999, and came into force on 1st January 2000.

The act provides for the inclusion of Protected Structures into the planning authorities' development plans and sets out statutory regulations regarding works affecting such structures. Under new legislation, no distinction is made between buildings formerly classified under development plans as List 1 and List 2. Such buildings are now all regarded as 'Protected Structures' and enjoy equal statutory protection. Under the act the entire structure is protected, including a structure's interior, exterior, attendant grounds and also any structures within the attendant grounds.

The act defines a Protected Structure as (a) a structure, or (b) a specified part of a structure which is included in a Record of Protected Structures (RPS), and, where that record so indicates, includes any specified feature which is in the attendant grounds of the structure and which would not otherwise be included in this definition. Protection of the structure, or part thereof, includes conservation, preservation, and improvement compatible with maintaining its character and interest. Part IV of the act deals with architectural heritage, and Section 57 deals specifically with works affecting the character of Protected Structures or proposed Protected Structures and states that no works should materially affect the character of the structure or any element of the structure that contributes to its special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. The act does not provide specific criteria for assigning a special interest to a structure. However, the National Inventory of Architectural Heritage (NIAH) offers guidelines to its field workers as to how to designate a building with a special interest, which are not mutually exclusive. This offers guidance by example rather than by definition:

Archaeological
It is to be noted that the NIAH is biased towards post-1700 structures. Structures that have archaeological features may be recorded, providing the archaeological features are incorporated within post-1700 elements. Industrial fabric is considered to have technical significance, and should only be attributed archaeological significance if the structure has pre-1700 features.

Architectural
A structure may be considered of special architectural interest under the following criteria:

- Good quality or well executed architectural design
- The work of a known and distinguished architect, engineer, designer, craftsman
- A structure that makes a positive contribution to a setting, such as a streetscape or rural setting
- Modest or vernacular structures may be considered to be of architectural interest, as they are part of the history of the built heritage of Ireland.
- Well-designed decorative features, externally and/or internally

Historical
A structure may be considered of special historical interest under the following criteria:

- A significant historical event associated with the structure
- An association with a significant historical figure
- Has a known interesting and/or unusual change of use, e.g. a former workhouse now in use as a hotel
- A memorial to a historical event.

Technical
A structure may be considered of special technical interest under the following criteria:

- Incorporates building materials of particular interest, i.e. the materials or the technology used for construction
- It is the work of a known or distinguished engineer
- Incorporates innovative engineering design, e.g. bridges, canals or mill weirs
- A structure which has an architectural interest may also merit a technical interest due to the structural techniques used in its construction, e.g. a curvilinear glasshouse, early use of concrete, cast-iron prefabrication.
- Mechanical fixtures relating to a structure may be considered of technical significance.

Cultural
A structure may be considered of special cultural interest under the following criteria:

- An association with a known fictitious character or event, e.g. Sandycove Martello Tower, which featured in Ulysses.
- Other structure that illustrate the development of society, such as early schoolhouses, swimming baths or printworks.

Scientific
A structure may be considered of special scientific interest under the following criteria:

- A structure or place which is considered to be an extraordinary or pioneering scientific or technical achievement in the Irish context, e.g. Mizen Head Bridge, Birr Telescope.

Social
A structure may be considered of special social interest under the following criteria:

- A focal point of spiritual, political, national or other cultural sentiment to a group of people, e.g. a place of worship, a meeting point, assembly rooms.

- Developed or constructed by a community or organisation, e.g. the construction of the railways or the building of a church through the patronage of the local community
- Illustrates a particular lifestyle, philosophy, or social condition of the past, e.g. the hierarchical accommodation in a country house, philanthropic housing, vernacular structures.

Artistic

A structure may be considered of special artistic interest under the following criteria:

- Work of a skilled craftsman or artist, e.g. plasterwork, wrought-iron work, carved elements or details, stained glass, stations of the cross.
- Well-designed mass-produced structures or elements may also be considered of artistic interest.

(From the NIAH Handbook 2003 & 2005 pages 15–20)

The Local Authority has the power to order conservation and restoration works to be undertaken by the owner of the protected structure if it considers the building to need repair. Similarly, an owner or developer must make a written request to the Local Authority to carry out any works on a protected structure and its environs, which will be reviewed within three months of application. Failure to do so may result in prosecution.

South Dublin County Development Plan 2016-2022

South County Dublin contains a large number of buildings, structures and sites of architectural, historic and/or artistic importance, in addition to numerous archaeological sites. This significant archaeological and architectural heritage is a valuable resource adding to the historical and cultural character of the County. The Development Plan contains policies which are intended to ensure the protection of this heritage. Village Design Statements can be utilised as a tool to guide development in smaller centres. It should be noted that archaeological sites and archaeological zones of interest are identified by a recorded monument reference number on the land use zoning maps. The recorded monument reference numbers are taken from the Record of Monuments and Places for Dublin, published by Department of the Environment, Heritage and Local Government.

Objectives relating to architectural heritage include:

- HCL3 Objective 1: To ensure the protection of all structures (or parts of structures) and the immediate surroundings including the curtilage and attendant grounds of structures contained in the Record of Protected Structures.
- HCL3 Objective 2: To ensure that all development proposals that affect a Protected Structure and its setting including proposals to extend, alter or refurbish any Protected Structure are sympathetic to its special character and integrity and are appropriate in terms of architectural treatment, character, scale and form. All such proposals shall be consistent with the Architectural Heritage Guidelines for Planning Authorities, DAHG (2011) including the principles of conservation.
- HCL3 Objective 3: To address dereliction and encourage the rehabilitation, renovation, appropriate use and re-use of Protected Structures.
- HCL5 Objective 1: To retain existing houses that, while not listed as Protected Structures, are considered to contribute to historic character, local character, visual setting, rural amenity or streetscape value within the County.
- HCL5 Objective 2: To ensure that the redevelopment of older buildings, including extensions and renovation works do not compromise or erode the architectural interest, character or visual setting of such buildings including surrounding housing estates or streetscapes.

- HCL5 Objective 3: To encourage the retention, rehabilitation, renovation and re-use of older buildings and their original features where such buildings and features contribute to the visual setting, collective interest or character of the surrounding area.
- HCL5 Objective 4: To ensure that infill development is sympathetic to the architectural interest, character and visual amenity of the area.

A5.4 APPENDIX 5.4: IMPACT ASSESSMENT AND THE CULTURAL HERITAGE RESOURCE

Potential Impacts on Archaeological And Historical Remains

Impacts are defined as 'the degree of change in an environment resulting from a development' (Environmental Protection Agency 2017). They are described as profound, significant or slight impacts on archaeological remains. They may be negative, positive or neutral, direct, indirect or cumulative, temporary or permanent.

Impacts can be identified from detailed information about a project, the nature of the area affected and the range of archaeological and historical resources potentially affected. Development can affect the archaeological and historical resource of a given landscape in a number of ways.

- Permanent and temporary land-take, associated structures, landscape mounding, and their construction may result in damage to or loss of archaeological remains and deposits, or physical loss to the setting of historic monuments and to the physical coherence of the landscape.
- Archaeological sites can be affected adversely in a number of ways: disturbance by excavation, topsoil stripping and the passage of heavy machinery; disturbance by vehicles working in unsuitable conditions; or burial of sites, limiting accessibility for future archaeological investigation.
- Hydrological changes in groundwater or surface water levels can result from construction activities such as de-watering and spoil disposal, or longer-term changes in drainage patterns. These may desiccate archaeological remains and associated deposits.
- Visual impacts on the historic landscape sometimes arise from construction traffic and facilities, built earthworks and structures, landscape mounding and planting, noise, fences and associated works. These features can impinge directly on historic monuments and historic landscape elements as well as their visual amenity value.
- Landscape measures such as tree planting can damage sub-surface archaeological features, due to topsoil stripping and through the root action of trees and shrubs as they grow.
- Ground consolidation by construction activities or the weight of permanent embankments can cause damage to buried archaeological remains, especially in colluviums or peat deposits.
- Disruption due to construction also offers in general the potential for adversely affecting archaeological remains. This can include machinery, site offices, and service trenches.

Although not widely appreciated, positive impacts can accrue from developments. These can include positive resource management policies, improved maintenance and access to archaeological monuments, and the increased level of knowledge of a site or historic landscape as a result of archaeological assessment and fieldwork.

PREDICTED IMPACTS

The severity of a given level of land-take or visual intrusion varies with the type of monument, site or landscape features and its existing environment. Severity of impact can be judged taking the following into account:

- The proportion of the feature affected and how far physical characteristics fundamental to the understanding of the feature would be lost;
- Consideration of the type, date, survival/condition, fragility/vulnerability, rarity, potential and amenity value of the feature affected;
- Assessment of the levels of noise, visual and hydrological impacts, either in general or site-specific terms, as may be provided by other specialists.

A5.5 APPENDIX 5.5: MITIGATIONS MEASURES AND THE CULTURAL HERITAGE RESOURCE

Potential Mitigation Strategies for Cultural Heritage Remains
Mitigation is defined as features of the design or other measures of the proposed development that can be adopted to avoid, prevent, reduce or offset negative effects.

The best opportunities for avoiding damage to archaeological remains or intrusion on their setting and amenity arise when the site options for the development are being considered. Damage to the archaeological resource immediately adjacent to developments may be prevented by the selection of appropriate construction methods. Reducing adverse effects can be achieved by good design, for example by screening historic buildings or upstanding archaeological monuments or by burying archaeological sites undisturbed rather than destroying them. Offsetting adverse effects is probably best illustrated by the full investigation and recording of archaeological sites that cannot be preserved in situ.

Definition of Mitigation Strategies

Archaeological Resource
The ideal mitigation for all archaeological sites is preservation in situ. This is not always a practical solution, however. Therefore, a series of recommendations are offered to provide ameliorative measures where avoidance and preservation in situ are not possible.

Archaeological Test Trenching can be defined as 'a limited programme of intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land, inter-tidal zone or underwater. If such archaeological remains are present field evaluation defines their character, extent, quality and preservation, and enables an assessment of their worth in a local, regional, national or international context as appropriate' (CIfA 2014a).

Full Archaeological Excavation can be defined as 'a programme of controlled, intrusive fieldwork with defined research objectives which examines, records and interprets archaeological deposits, features and structures and, as appropriate, retrieves artefacts, ecofacts and other remains within a specified area or site on land, inter-tidal zone or underwater. The records made and objects gathered during fieldwork are studied and the results of that study published in detail appropriate to the project design' (CIfA 2014b).

Archaeological Monitoring can be defined as 'a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive (CIfA 2014c).

Underwater Archaeological Assessment consists of a programme of works carried out by a specialist underwater archaeologist, which can involve wade surveys, metal detection surveys and the excavation of test pits within the sea or riverbed. These assessments are able to access and assess the potential of an underwater environment to a much higher degree than terrestrial based assessments.

Architectural Resource
The architectural resource is generally subject to a greater degree of change than archaeological sites, as structures may survive for many years but their usage may change continually. This can be reflected

in the fabric of the building, with the addition and removal of doors, windows and extensions. Due to their often more visible presence within the landscape than archaeological sites, the removal of such structures can sometimes leave a discernable 'gap' with the cultural identity of a population. However, a number of mitigation measures are available to ensure a record is made of any structure that is deemed to be of special interest, which may be removed or altered as part of a proposed development.

Conservation Assessment consists of a detailed study of the history of a building and can include the surveying of elevations to define the exact condition of the structure. These assessments are carried out by Conservation Architects and would commonly be carried out in association with proposed alterations or renovations on a Recorded Structure.

Building Survey may involve making an accurate record of elevations (internal and external), internal floor plans and external sections. This is carried out using an EDM (Electronic Distance Measurer) and GPS technology to create scaled drawings that provide a full record of the appearance of a building at the time of the survey.

Historic Building Assessment is generally specific to one building, which may have historic significance, but is not a Protected Structure or listed within the NIAH. A full historical background for the structure is researched and the site is visited to assess the standing remains and make a record of any architectural features of special interest. These assessments can also be carried out in conjunction with a building survey.

Written and Photographic record provides a basic record of features such as stone walls, which may have a small amount of cultural heritage importance and are recorded for prosperity. Dimensions of the feature are recorded with a written description and photographs as well as some cartographic reference, which may help to date a feature.

6.0 POPULATION AND HUMAN HEALTH

6.1 Introduction

This chapter evaluates the impacts of the proposed development on population and human health.

In accordance with the Draft EPA EIA Report Guidelines (2017) and EPA Draft Advice Notes for EIS (2015), this chapter has considered the "existence, activities and health of people" with respect to "topics which are manifested in the environment such as employment and housing areas, amenities, extended infrastructure or resource utilisation and associated emissions". Natural hazards are considered in Chapter 2 (Section 2.7) and Chapter 6. Issues examined in this chapter include:

- Demography;
- Population;
- Employment;
- Social Infrastructure;
- Landscape, Amenity and Tourism;
- Natural Resources;
- Air Quality;
- Noise & Vibration;
- Material Assets;
- Traffic; and
- Health and Safety.

Where these topics are dealt with in further detail elsewhere in this EIA Report, the relevant chapters have been cross-referenced in this Chapter.

6.2 Project Description

The site is located in the Woodland townland, off Stocking Avenue in County Dublin. The greenfield site is bounded by the M50 to the north and Stocking Avenue to the south. To the east and west of the site lie residential properties.

The proposed development will comprise the construction of 241 no. residential units in a mix of 1 and 2 bed apartments, provided across 5 no. apartment blocks, ranging in height from 4-6 storeys, and 3 no. three storey duplex blocks. The development will also provide associated residential amenity facilities and a community centre space.

The development will also include hard and soft landscaping, boundary treatments, public lighting, ESB substations, plant and switch rooms, and residential waste facilities, piped site wide services, and all ancillary works and services necessary to facilitate construction and operation. The development will be served by a vehicular access from Stocking Avenue on the southern side of the site.

A full description of the development can be found in Section 3.2.3 of this EIAR.

6.3 Methodology

As per Article 3 of Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU:

"1. The environmental impact assessment shall identify, describe, and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:

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

2. The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned."

A 2017 publication by the European Commission, Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report, considered that:

"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 chapter will follow these EC guidelines and will examine the health effects relevant to the proposed development as they relate to a relevant, defined Study Area. The effects of the proposed development on the population and human health are analysed in compliance with the requirements of the EPA Draft EIA Report Guidelines 2017.

6.3.1 Assessment of Significance & Sensitivity

The assessment of significance is a professional appraisal based on the sensitivity of the receptor and the magnitude of the effect.

Within any area, the sensitivity of individuals in a population will vary. As such, it would be neither representative of the population, nor a fair representation of the range of sensitivities in a population were an overall sensitivity classification assigned to the population in question.

As such, the precautionary principle has been adopted for this assessment, which assumes that the population within the Study Area is of a uniformly high sensitivity.

6.3.2 Magnitude of Impact

The magnitude of predicted impacts has been quantified in this assessment using the terms outlined in Table 6.1 below:

Magnitude	Description of Magnitude
High	Change in an environmental and/or socioeconomic factor(s) as a result of the proposed development which would result in a **major change** to existing baseline conditions (adverse or beneficial)
Medium	Change in an environmental and/or socioeconomic factor(s) as a result of the proposed development which would result in a **moderate change** to existing baseline conditions (adverse or beneficial)
Low	Change in an environmental and/or socioeconomic factor(s) as a result of the proposed development which would result in a **minor change** to existing baseline conditions (adverse or beneficial)
Negligible	Change in an environmental and/or socioeconomic factor(s) as a result of the proposed development which would not result in change to existing baseline conditions at a population level, but may still result in an individual impact (adverse or beneficial)
No change	No change would occur as a result of the proposed development which would alter the existing baseline conditions (adverse or beneficial)

Table 6.1: Magnitude of Predicted Impacts

6.3.2 Significance of Effects

The assessment of the significance of effects in this assessment is a professional appraisal and has been based on the relationship between the magnitude of effects and the sensitivity of the receptor. Table 6.2 below provides a matrix on the measure of the significance of effects based on these parameters.

		Magnitude of Impact			
		Negligible	**Low**	**Medium**	**High**
Sensitivity of Receptor	**Negligible**	Negligible	Negligible or minor	Negligible or minor	Minor
	Low	Negligible or minor	Negligible or minor	Minor	Minor or moderate
	Medium	Negligible or minor	Minor	Moderate	Moderate or major

	High	Minor	Minor or moderate	Moderate or major	Major

Table 6.2: Matrix illustrating the significance of effects as determined by the relationship between the magnitude of impact and the sensitivity of receptors

The Study Area selected for the assessment of baseline population factors and of the impact the proposed development would have on the human health of people within this population was defined as Electoral Division (ED) as per the 2016 census data surrounding the proposed development site (CSO, 2016) These electoral divisions chosen are;

- Firhouse – Ballycullen (ED Code 03012)
- Firhouse Village (ED Code 03014)
- Firhouse – Knocklyon (ED Code 03013)
- Ballyboden (ED Code 03002)
- Edmondstown (ED Code 13011)
- Bohernabreena (ED Code 03003)

The study area is presented in Figure 6.1 below.

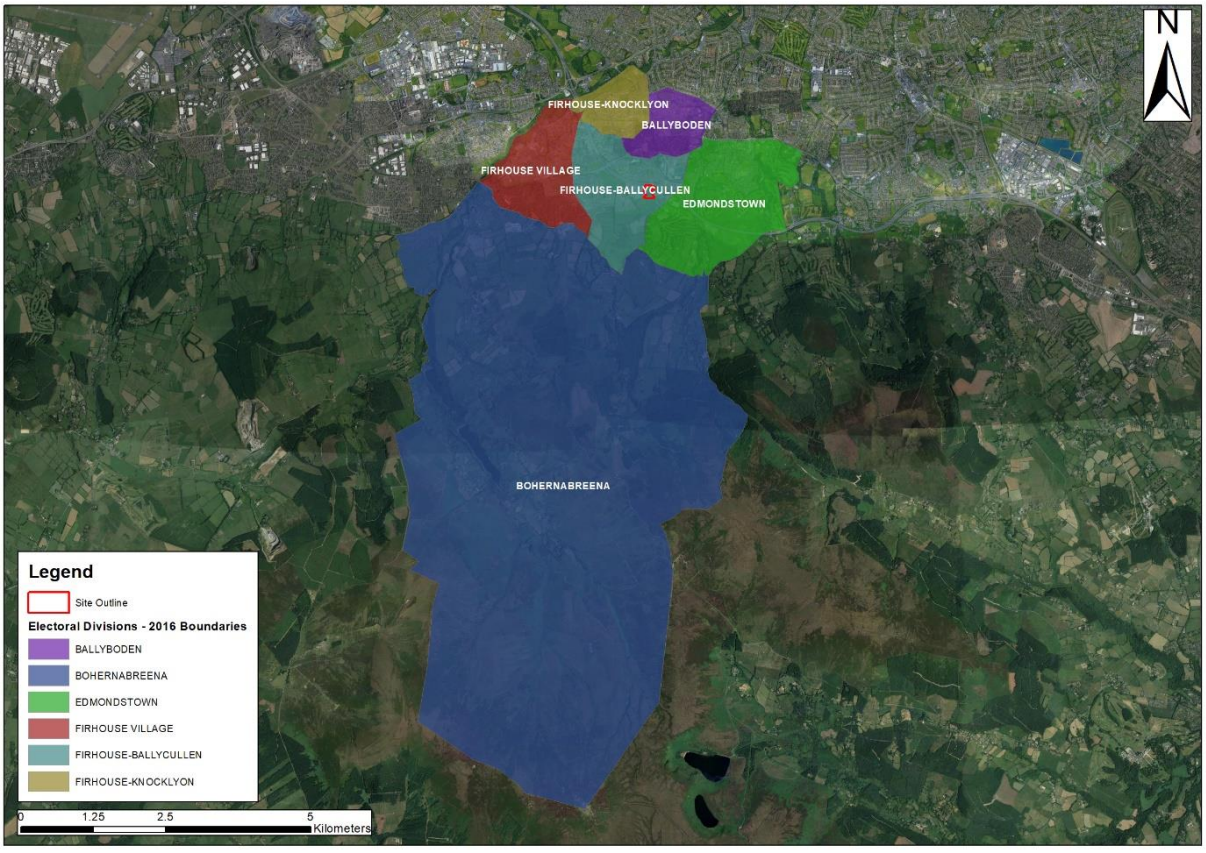


Figure 6.1: Map illustration the selected Study area for the proposed development (CSO, 2016)

6.4 Key Factors

6.4.1 Population Trends

The most recent census of population was carried out by the CSO on the 24th of April 2016. The previous census was completed on the 10th of April 2011 and before that on 23rd April 2006. The census compiles data for the whole state as well as smaller individual areas including counties, cities, towns and electoral divisions. Taking into consideration the location of the proposed development, the census information on population, age profile, employment and social class, has been analysed in relation to the South Dublin County Council Region.

The latest census data shows that the population in the South Dublin County Council (SDCC) area grew by 5.1% between the years 2011 and 2016 compared with 3.8% nationally. The average rate of population growth across the Study Area was 5.2%, the electoral division for the site, saw a higher rate of growth with an increase of 7% (Table 6.3). Projections for the national and the county populations are predicted to continue this trend of moderate to high population growth into the short-term future.

Area	2011	2016	% Change 2011-2016
State	4,588,252	4,761,865	+ 3.8%
South Dublin	265,205	278,749	+ 5%
Firhouse – Ballycullen	7,773	8,280	+ 7%
Firhouse Village	11,648	12,199	+5%
Firhouse – Knocklyon	3,602	3,514	- 2%
Ballyboden	5,082	4,959	+2%
Edmondstown	5,712	5,764	1%
Bohernabreena	4,592	4,552	-0.87%

Table 6.3: Population change at National primary and hinterland level from 2011-2016 (CSO, 2016)

6.4.1.1 Population Profile

The age profile of the population in the area is an important parameter as it provides a good insight into the potential labour force, the demand for schools, amenities, other facilities and the future housing demand.

Table 6.4 shows the age profiles Nationally and in South Dublin for 2016.

Area	0-18	19-24	25-44	45-64	65+	Total Persons
State*	21%	12%	30%	24%	13%	4,761,865
South Dublin*	23%	12.2%	31.4%	22.3%	11.1%	247,842
Firhouse – Ballycullen	30.9%	8.3%	30.1%	25.9%	4.68%	8,230
Firhouse Village	31.7%	6.65%	32.7%	21.84%	7.13%	12,214
Firhouse – Knocklyon	20.23%	7.53%	22.2%	28.1%	21.9%	3,505
Ballyboden	22.67%	9.7%	24.6%	29.8%	13.1%	5,028
Edmondstown	27.4%	7.8%	27.3%	26.7%	10.6%	5,757
Bohernabreena	30.9%	5.8%	30.2%	23.2%	9.9%	4,496
Study Area (Mean)	27%	8%	28%	26%	11%	6,538

Table 6.4: Age profile at National and County Level 2016 (CSO, 2016)

*** 0**-18 = 0-14 number for regional and national 19-24 =15-24 for regional and national

This table shows that Nationally, the SDCC area, and the Study Area, the dominant age grouping is 25-44 at 30%, 31.4% and 28% of the total population, respectively. The figures for both South Dublin and the Study Area indicate a young working-age population in the area which is in line with the national level. This is in keeping with census data from 2011 and 2006.

6.4.2 Employment

Table 6.5 presents the employment statistics in 2016 compared with 2011. The data shows that unemployment decreased significantly in South Dublin, as well as nationally, reflecting the economic recovery in recent years.

	At Work	Looking for first regular job	Unemployed having lost or given up previous job	Total in labour force	% Unemployment
2011 Labour Force					
State	1,807,360	34,166	390,677	3,608,662	11.8
South Dublin	106,534	2,361	23,678	203,924	19.6
2016 Labour Force					
State	2,006,641	31,434	265,962	3,755,313	7.9
South Dublin	119,210	2,030	16,235	186,266	13.3

Table 6.5: Employment statistics Nationally and at County level in 2011 and 2016 (CSO, 2016)

The 2016 census data shows that the majority of people in employment in the South Dublin area are in 'Managerial and Technical' employment (28.3%) with the least represented social class being 'semi-skilled' workers at (9.4%).

At a local level, the dominant social class in the Firhouse – Ballycullen area is 'Managerial and Technical' employment' (3,808 persons in total) with 'Unskilled' being the least representative (57 persons in total)

6.4.2.1 Labour Force Survey

The Labour Force Survey (LFS) is a large-scale, nationwide survey of households in Ireland carried out every three months. It generates labour force estimates which include the official measure of employment and unemployment for the state.

The results Nationally for Q4 2019 showed that there were 2,361,000 people employed in the State with 110,600 registered as unemployed. This represents a 3.5% increase in employment between Q4 2018 and Q4 2019.

In Q4 2019, the majority of people were employed in the wholesale and retail trade and repair of motor vehicles and motorcycles sectors, with industry, and human health and social work activities closely following.

6.4.3 Economy

6.4.3.1 Income

The below data, obtained from CSO Statbank (CIA01), demonstrate that the levels of total income per person in the Dublin area are higher than that within the State. In 2015 (most up to date data on CSO Statbank), the total income per person in the Dublin area was 24% higher than that within the State in 2015.

	2010	2011	2012	2013	2014	2015
Dublin	28,514	28,639	29,699	29,434	30,199	31,906
State	24,840	24,596	25,273	24,910	25,388	26,698

Table 6.6: Total Income per Person (Euro) for Dublin and the State (Source: CSO Statbank CIA01)

A similar pattern of income distribution is observed in data on disposable income per person, wherein the Dublin area the disposable income per person was 27% higher than that of in the State in 2015.

	2010	2011	2012	2013	2014	2015
Dublin	21,416	20,850	21,632	21,200	21,919	23,298
State	19,558	18,889	19,429	18,898	19,265	20,334

Table 6.7: Total Disposable Income per Person (Euro) for Dublin and the State (Source: CSO Statbank CIA01)

Nationally average weekly earnings were €783.62 in Q4 2019, an increase of 3.5% from €757.21 one year earlier according to preliminary estimates of the Earnings and Labour Costs Quarterly release. Final data for average weekly earnings in Q3 2019 were €769.14 and showed an increase of 3.6% from the same period in 2018. See tables 1 and 4.

6.4.3.2 Deprivation

Deprivation in small areas is mapped using the Pobal HP Deprivation Index. This Index draws on data from censuses and combines three dimensions of relative affluence and deprivation; Demographic Profile, Social Class Composition and Labour Market Situation. Figure 6.2 below shows a graphical representation of how the concepts of Demographic Growth, Social Class Composition and Labour Market Situation are measured by ten key socio-economic indicators from the Census of Population. In this EIA Report, the Relative Index Score is considered as the measure for deprivation, as these Relative Index Scores are rescaled such that the mean is 0 and standard deviation is 10 at each census wave. This allows for the provision of descriptive labels with the scores, which are grouped by standard deviation as seen in Table 6.8 below.

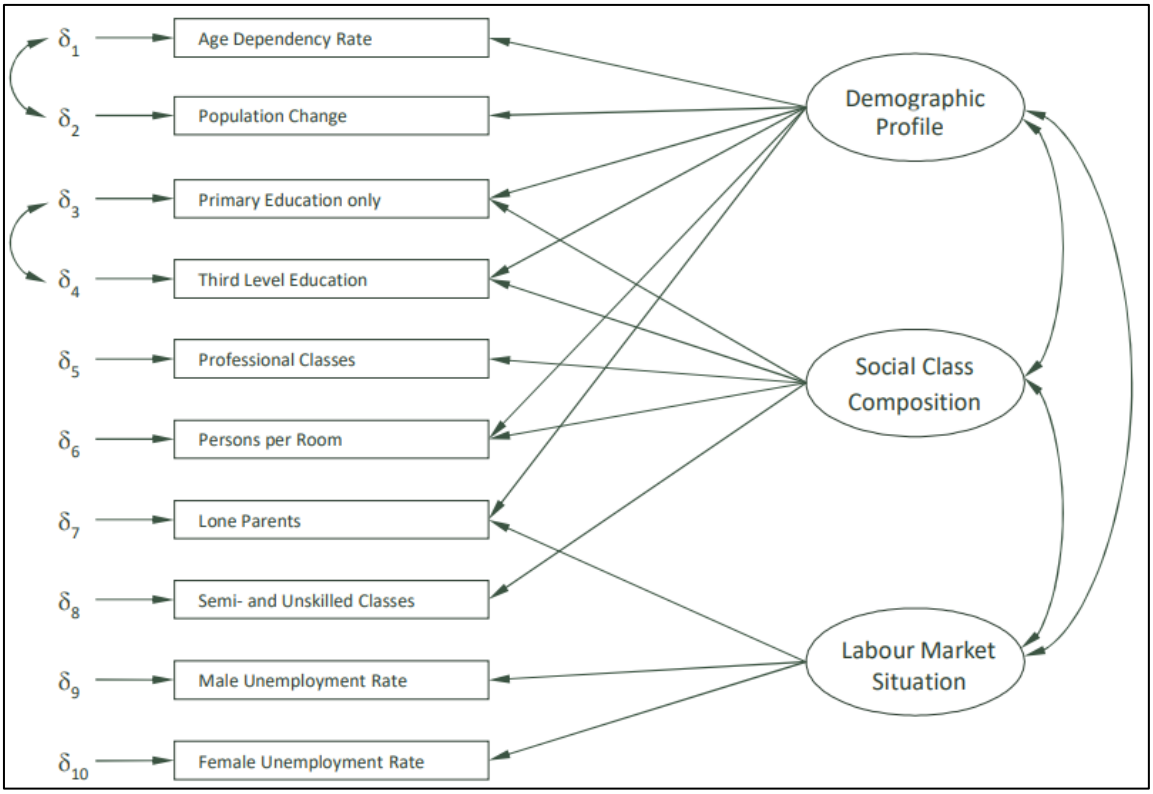


Figure 6.2: Graphical representation of how the concepts of Demographic Growth, Social Class Composition and Labour Market Situation are measured by ten key socio-economic indicators from the Census of Population (Hasse & Pratschke, 2017).

Relative Index Score	Standard Deviation	Label
> 30	> 3	Extremely affluent
20 – 30	2 – 3	Very affluent
10 – 20	1 – 2	Affluent
0 – 10	0 – 1	Marginally above average
0 – -10	0 – -1	Marginally below average
-10 – -20	-1 – -2	Disadvantaged
-20 – -30	-2 – -3	Very disadvantaged
< -30	< -3	Extremely disadvantaged

Table 6.8: Pobal HP Index Relevant Index Score labels (Source: Pobal HP Deprivation Index)

The data in Table 6.9 shows that the population living within the Study Area are generally classified as 'Marginally above average', with a Relative Index Score of 6.44. Similarly, the population within the South Dublin region are generally classified as 'Marginally above average' with a Relative Index Score of 3.00. Figure 5.3 below presents the Pobal HP Index map illustrating the Study Area.

	Relative Index Score	Pobal HP Description 2016
South Dublin	3.00	Marginally above average
Firhouse – Ballycullen	13.09	Affluent
Firhouse Village	4.76	Marginally above average
Firhouse – Knocklyon	8.29	Marginally above average
Ballyboden	11.19	Affluent
Edmondstown	2.76	Marginally above average
Bohernabreena	-1.40	Marginally below average
Study Area (Mean)	6.44	Marginally above average

Table 6.9: Pobal HP Index Relevant Index Score Figures at a local and County level (Source: Pobal HP Deprivation Index)

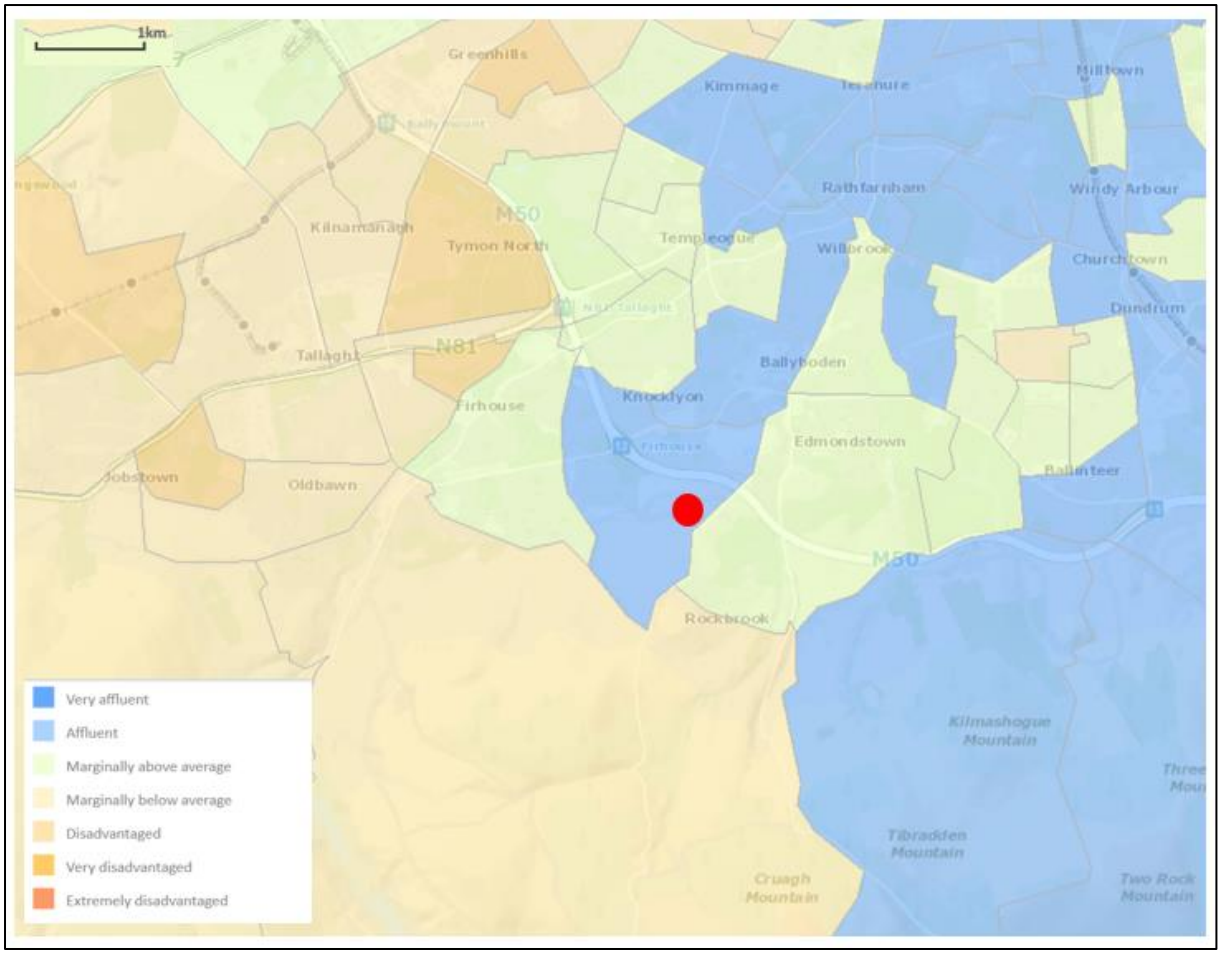


Figure 6.3: Pobal HP Index maps illustrating the Study Area with the site location shown with a red dot. (Source: Pobal HP Deprivation Index)

6.4.4 Health

The following section provides a summary of various health aspects for the Study Area.

Physical Health

State data shows that life expectancy nationally for both males and females has increased consistently since 1991, with female life expectancy consistently higher than male (Table 6.10)

Period Life Expectancy in Ireland by sex					
	1991	1996	2002	2006	2011
Male	72.3	73	75.1	76.8	78.4
Female	77.9	78.5	80.3	81.6	82.8

Table 6.10: Period Life Expectancy in Ireland by sex (Source: CSO Statbank VSA30)

A similar pattern of increasing life expectancy has been recorded in Dublin, where life expectancy has been recorded as steadily increasing since 2002, with female life expectancy consistently higher than male (Table 6.11)

Period Life Expectancy in Dublin by sex			
	2002	2006	2011
Male	75.2	76.7	78.3
Female	80.2	81.2	82.7

Table 6.11: Period Life Expectancy in Dublin by sex (Source: CSO Statbank VSA31)

The rate of hospital admissions for circulatory diseases is lower than that in the State (Table 6.12). On average, admissions of this nature are 11.7% lower in the Dublin area than in the State

Circulatory Diseases Admission Rate per 100,000 Population				
	2010	2011	2013	2014
Dublin	3805.56	3498.7	3950.4	4176.7
State	4308.57	4026.8	4495.6	4644.6

Table 6.12: Circulatory Diseases Admission Rate per 100,000 Population at a National and County level (Source: CSO Statbank DHA12)

In terms of respiratory diseases, the rate of hospital admissions in Dublin City tends to fall broadly in line with that of the State (Table 6.13). The rates of admissions in Dublin City and the State have seen an average increase in admissions of c. 7% since 2011.

Respiratory Diseases Admission Rate per 100,000 Population				
	2010	2011	2013	2014
Dublin	2483.76	2349.73	2585.7	2693.7
State	2402.62	2361.02	2633.6	2691

Table 6.13: Respiratory Diseases Admission Rate per 100,000 Population at a National and County level (Source: CSO Statbank DHA12)

Mental Health

The rates of death by suicide and intentional self-harm in Dublin City are consistently lower than those in the State (Table 6.14). The rate of death by suicide and intentional self-harm are generally decreasing year-on-year in line with the pattern seen in the State.

Death by Suicide and Intentional Self Harm Rate per 100,000 Population				
	2010	2011	2013	2014
Dublin	8.42	9.01	8.63	7.45
State	10.87	12.11	11.8	10.34

Table 6.14: Death by Suicide and Intentional Self Harm Rate per 100,000 Population (Source: Public Health Well Community Profiles)

The number of admissions to hospital for anxiety or depression have followed a pattern of decreasing across both Dublin City and the State since 2009 (Table 6.15). Generally, the

number of admissions to hospital for anxiety or depression are lower than those seen in the State.

Number of admissions to hospital for anxiety or depression per 1,000 people			
	2009	2013	2014
Dublin	2.2	2	1.4
State	2.3	2	1.8

Table 6.15: Number of admissions to hospital for anxiety or depression per 1,000 people (Source: Public Health Well Community Profiles

Lifestyle

In terms of lifestyle, populations in Dublin are broadly similar to those in the State, with rates of smoking, consumption of alcohol and prevalence of eating 5 portions or more fruit or vegetables daily being similar across both comparative areas (Table 6.16).

	Smoking daily (%)	Smoking occasionally (%)	Prevalence of drinking alcohol (%)	Prevalence of eating 5 portions or more fruit or vegetables daily (%)
Dublin	14	8	86	42
State	15	7	81	42

Table 6.16: Prevalence of smoking, drinking alcohol and consumption of fruit and vegetables of persons aged 15 and over (Source: CSO Statbank IH079)

Activity levels in Dublin tend to be slightly higher than those in the State, with the prevalence of individuals walking and cycling as a form of transport, as well as levels of participation in sports, fitness or recreational physical activities being higher in Dublin than in the State (Table 6.17).

	Walk to get to and from places	Cycle to get to and from places	Sports, fitness or recreational physical activities	Muscle strengthening activities
Dublin	90	18	54	37
State	86	14	49	34

Table 6.17: All persons aged 15 and over by Region, Year and Physical Activity Undertaken (Source: CSO Statbank IH072)

6.4.5 Social Infrastructure Provision

Residential Dwellings

The site is located in the Woodland townland, off Stocking Avenue in County Dublin. The greenfield site is bounded by the M50 to the north and Stocking Avenue to the south. To the east and west of the site lie residential properties. The nearest existing residential locations to the proposed development are at Green Acres House and White Pines Meadow, which are located directly adjacent to the east and west boundaries respectively. Stocking Hill is located some 40m to the east and Ait Linn is located some 90m to the southeast of the site.

.

Schools

There are a number of primary and secondary schools in the vicinity of the proposed development including:

- St. Colmcilles Community School on the Scholarstown Road c. 560 m north-west of the site;
- Sancta Marina College in Rathfarnham c. 1.2 km north of the site;
- Edmonstown National School in Edmondstown c. 1 km east of the site;
- Scoil Mhuire in Rathfarnham 1.6 km to the northeast of the site;
- St Colmcilles Junior National School 1 km to the north-west of the site.

The closest third-level institution in the area is the Institute of Technology Tallaght c. 3.8 km north-west of the site.

Health
The nearest hospital to the site is Tallaght University Hospital located c. 4.5 km west of the site.

Security
Rathfarnham Garda station is located on Butterfield Avenue in Rathfarnham c. 3 km north of the site and Rathfarnham fire station is located on Nutgrove Avenue, Rathfarnham (c. 3.2 km northeast of the site).

6.5 Likely Impacts and Proposed Mitigation Measures

6.5.1 Impacts on Population Profile and Trends

The main potential impacts on local businesses and residences associated with the Proposed Development will be in relation to air quality, noise, visual impact and traffic. The potential impacts and mitigation measures to address them are dealt with within the corresponding chapters of this EIA Report as follows:

- Chapter 9 – Air Quality and Climate
- Chapter 10 – Noise and Vibration
- Chapter 11 – Landscape and Visual Impact
- Chapter 13 – Traffic and Transportation

It is predicted that there will be a slight positive impact on local business activity during the construction phase with the increased presence of up to circa. 250 no. construction workers using local facilities. A slight positive impact is also predicted following the completion of the development due to the increase of population as residents move to the area.

There may be a short term slight negative impact on the local residential population during the construction phase and the operational phase (as described in section 6.6.2 below and Chapter 12 – Noise and Vibration). It is anticipated that the Proposed Development will have indirect positive effects on employment in terms of construction material manufacture, maintenance contracts, equipment supply, landscaping etc. It is likely that the Proposed Development, during both the construction and operational phases, will have a negligible significance of effects on businesses and residences with respect to human health.

6.5.2 Potential Impacts on Local Amenities and Tourism

The location of the proposed development is within an existing area of residential development and will have a minimal impact on the local landscape amenity as the site itself, although largely greenfield is currently not used for any agricultural or amenity uses. There will be no impact on the local parks or nearby amenities such as the Hellfire Club Marley park or the Edmondstown or Rathfarnham Golf Clubs.

It is not anticipated that the development will have any impact on local tourism or shopping amenities apart from the slight positive impact economically on nearby commercial businesses.

The proposed development will not create any wastewater discharge which could have a potential impact on local amenities or the local population.

6.5.3 Health and Safety

Do Nothing Scenario

As the site is currently greenfield there will be no impact to health and safety to workers or the general public due to the lack of development.

Construction Phase

The proposed development has been designed in accordance with the Safety, Health and Welfare at Work Act 2005 (S.I. 10 of 2005) as amended and the Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. 299 of 2007) as amended and associated regulations. The proposed development has been designed by skilled personnel in accordance with internationally recognised standards, design codes, legislation, good practice and experience based on a number of similar existing facilities operated by the operator.

The proposed development has the potential for an impact on the health and safety of workers employed on the site, particularly during the construction phase. The activities of contractors during the construction phase will be carried out in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013) as amended to minimise the likelihood of any impacts on worker's health and safety.

Operational Phase

The 2014 EIA Directive, 2018 EIA Regulations and associated EPA Draft EIA Report Guidelines 2017 require that the vulnerability of the project to major accidents and/or natural disasters (such as earthquakes, landslides, flooding, sea-level rise etc.) is considered in the EIA Report.

The site has been assessed in relation to the following external natural disasters; landslides, seismic activity, volcanic activity and sea-level rise/flooding as outlined below. The potential for major accidents to occur at the proposed development site has also been considered with reference to Seveso/Control of Major Accident Hazards (COMAH) Regulations.

There is a negligible risk of landslides occurring at the site and in the immediate vicinity due to the topography and soil profile of the site and surrounding areas. There is no history of seismic activity in the vicinity of the site. There are no active volcanoes in Ireland so there is no risk of volcanic activity.

6.5.3.1 Flooding

The potential risk of flooding on the site was also assessed. A Stage 1 Flood Risk Assessment was carried and the details of these are included in Chapter 10 Hydrology and concludes the development is not at risk of flooding. Furthermore, the proposed development design has adequate drainage etc. to ensure there is no potential impact on flood risk for other neighbouring properties.

There is a potential impact on the receiving environment as a result of minor accidents/leaks of fuel/oils during the construction and operational phases. However, the implementation of the mitigation measures set out in Chapter 8 (Land & Soils) and Chapter 10 (Hydrology) of the EIA Report will ensure the risk of a minor/accident is low and that the residual effect on the environment is imperceptible.

6.5.3.2 COMAH Establishments

In 2012, the so-called "Seveso Directive" (Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC) was adopted. The Seveso Directive applies to in excess of 12,000 establishments in the European Union where dangerous substances are stored or used in large quantities. The Seveso Directive was transposed into Irish law by S.I. No. 209/2015 - Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (the "COMAH Regulations"). It is the purpose of the COMAH Regulations to implement the Seveso Directive in an Irish context, and through the measures, it implements, prevent major accidents involving dangerous substances, and limit the consequences of any such major accidents for human health and the environment. These regulations categorise relevant establishments into upper- and lower-tier establishments. The categorisation of establishments depends on the qualifying quantity (tonnes) of dangerous substances listed in Part 1 or Part 2 of Schedule 1 of the COMAH Regulations present at the establishment.

There are no upper or lower tier Seveso/ COMAH sites in the vicinity of the proposed development. The closet registered site is the Irish Distillers site at Robinhood Road, Fox & Geese, Clondalkin, Dublin 22, 5.78 km to the north-west.

6.6 Human Health – Potential Environmental Impacts on Human Beings & Amenity

6.6.1 Air & Climate

As outlined in Chapter 9 (Air Quality and Climate), 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 based on the protection of the environment as well as the protection of human health. Additional factors such as natural background levels, environmental conditions and socio-economic factors are also considered in the limit values which are set (see Chapter 11, Table 11.1). The ambient air quality standards established are designed to minimise harmful effects on health.

6.6.1.1 Construction Phase

As detailed in Chapter 11 (Air Quality & Climate), best practice mitigation measures will be implemented 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 and the environment. The impact of the construction phase of the Proposed Development is likely to be neutral, short-term and imperceptible with respect to human health. Similar mitigation measures and impacts exist for decommissioning.

6.6.1.2 Operational Phase

As detailed in Chapter 11 Air Quality & Climate, air dispersion modelling was undertaken to assess the impact of the development with reference to EU ambient air quality standards which are based on the protection of human health. As demonstrated by the dispersion modelling results, emissions from the site, are compliant with all National and EU ambient air quality limit values and, therefore, will not result in a significant impact on human health.

It is likely that the Proposed Development, during both the construction and operational phases, will have a negligible significance of effects on air quality with respect to human health.

6.6.2 Noise & Vibration

Noise and vibration impacts associated with the development have been fully considered within Chapter 12 of the EIA Report. Commentary on the impact assessment and related noise levels are summarised below with respect to potential environmental health impacts.

6.6.2.1 Construction Phase

As detailed in Chapter 12 (Noise and Vibration), there will be some impact on nearby noise sensitive properties due to noise emissions from site activity and traffic. The application of noise limits and limits on the hours of operation, along with the implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum. The level of vibration effect during surface construction works is greatly reduced when the origin and time frame of the works are known and limit values relating to structural integrity are adequately communicated. The use of clear communication and information circulars relating to planned works, their duration and vibration monitoring can

significantly reduce vibration effects to the neighbouring properties. Therefore, the noise and vibration impact of the construction phase of the proposed development is likely to be temporary to short-term and slight negative with respect to human health because of the temporary to short-term construction phase.

6.6.2.2 Operational Phase

As detailed in Chapter 12, noise modelling was undertaken to assess the impact of the proposed development of the site with reference to noise limits typically applied by SDCC and the EPA. As demonstrated by the modelling results, the predicted noise emissions associated with the proposed development of the site during the operational phases are compliant with the adopted noise limit values which are based with due consideration of the effect on human health. Furthermore, any change in noise levels associated with additional vehicles at road junctions in the vicinity of the proposed development is expected to be not significant. In essence, the noise levels that are encountered at the nearest noise sensitive locations are predicted to be within relevant noise criteria that have been adopted here for the operation of the proposed facility and associated infrastructure. These criteria have been selected with due consideration to human health, therefore, will not result in a significant impact on human health.

The proposed development will not generate any perceptible levels of vibration during operation and therefore there will be no impact from vibrations on human health.

6.6.3 Material Assets

The proposed development and its surroundings will not require any significant electrical power supply and will not generate significant quantities of wastewater or surface water. Utility providers have provided confirmation that there is sufficient capacity in the area network for the required power and drainage demands. The implementation of mitigation measures outlined in Chapter 15 will ensure there will be no impact on material assets to local residential or business users.

6.6.4 Additional Traffic

An assessment of the additional traffic movements associated with the proposed development during the construction and operational phases is presented in Chapter 14 (Traffic and Transportation).

As stated in Chapter 14, the traffic assessment shows that the additional traffic movements associated with the proposed development were found to be short term, imperceptible and slight effect for the construction phase and long term in duration and negligible effects for the operational phase on the local network (Section 14.8.1.2).

6.6.5 Unplanned Event/ Impacts on Health & Safety

Specific impact to health and safety are covered in section 6.5.6 above The Department of Health is leading the government response in Ireland to the national public health risk posed by Coronavirus Disease 2019 (COVID-19). Exposure to COVID-19 may present a health risk to workers and other persons at the workplace. Employers are advised to follow the latest public

health advice and identify and implement suitable control measures to mitigate the risk of COVID-19 infection in the workplace. These public health measures should be communicated to all relevant employees and others at the place of work.

Employees should follow the public health official advice and guidance including ensuring good hygiene practices, such as frequent hand washing and respiratory etiquette, to protect against infections and should seek professional healthcare advice if unwell. These measures apply to both the construction phase and operational phase of the subject development.

6.7 REMEDIAL AND MITIGATION MEASURES

The impacts on the local population in terms of residents and businesses are considered to be mainly positive in the sense of creating direct employment opportunities and indirect additional business, both during the construction and operational phases.

Mitigation measures proposed to minimise the potential impacts on human health in terms of air quality and climate and noise and vibration are discussed in the relevant sections of Chapters 11 and 12, respectively.

Chapter 14 Traffic and Transportation addresses mitigation measures proposed to reduce the impact of additional traffic movements to and from the development.

6.8 RESIDUAL IMPACTS

It is expected that the proposed development will have a not significant, positive and long-term impact on the immediate hinterland through continued employment opportunities and the associated economic and social benefits.

There are no predicted adverse impacts with respect to socio-economic factors, land-use or the amenity value and tourism potential of the area, primarily due to the location of the proposed development which is in an area of established residential development.

All other environmental aspects relating to the human environment which have the potential to impact on the local population such as air quality and climate, noise and vibration, material assets and traffic are addressed in Section 668 and in more detail in the relevant chapters of this EIA Report.

Measures outlined in Sections 6.5.6 and 6.6.5 will be put in place to ensure the health and safety of all site personnel ad residents during both construction and operational phases.

6.9 CUMULATIVE IMPACTS

Permitted developments in the vicinity of the proposed development are listed in Chapter 3. There is no predicted significant cumulative impact associated with the construction or operational phase of these projects.

The proposed development has been designed to ensure there are no significant residual effects on human health when taking into account the surrounding land uses. As such it is anticipated that the proposed development will not have a significant effect on human health.

As the proposed development will have a positive impact on the immediate hinterland and the South Dublin Region through economic and social benefits, it is concluded that any cumulative impacts on population and human health will be positive and long-term.

6.9 CONCLUSIONS

It is not predicted that the proposed development will have any adverse effects on human health during either the construction or operational phase.

The proposed development will have numerous direct and indirect benefits on a regional and national scale and will have an overall positive effect on the local, regional and national population in terms of providing key residential development to ameliorate the effects of the current housing crises.

6.10 REFERENCES

6.10.1 Bibliography

- Architecture Ireland (2015) The Built Environment and Mental Health
- Central Statistics Office Ireland (CSO) (2016) Census Results
- Department of Communications, Climate Action & Environment (2017) Cleaning Our Air – Public Consultation to Inform the Development of a National Clean Air Strategy
- Department of Health (2019) Health in Ireland, Key Trends.
- EPA (2017) Guidelines on Information to be Contained in Environmental Impact Assessment Reports (Draft).
- EPA (2019) Air Quality in Ireland 2018
- European Commission (2015) Noise Impacts on Health
- ISOVARP (2010) Urban Planning and Human Health in the European City – Report to the World Health Organisation
- The Institute of Public Health in Ireland (2006), Health Effects of the Built Environment: A Review
- Hasse & Pratschke (2017) The 2016 Pobal HP Deprivation Index for Samll Areas, Pobal 2017.
- World Health Organisation (2016) Urban Green Spaces and Health – A Review of Evidence
- World Health Organisation (2006) Health Effects and Risks of Transport Systems; the Hearths Project

6.10.2 Web References

- Central Statistics Office Stat Bank, Accessed April 2020 https://statbank.cso.ie/px/pxeirestat/statire/SelectTable/Omrade0.asp?Planguage=0
- Pobal Deprivation Index, Accessed April 2020 https://maps.pobal.ie/WebApps/DeprivationIndices/index.html

7.0 BIODIVERSITY

7.1 Introduction and Methodology

This section of the Environmental Impact Assessment Report (EIAR) was carried out by 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 within the potential zone of influence (ZOI). It also outlines the standard construction, operational and monitoring measures that are proposed to minimise potential impacts and to improve the biodiversity potential of the proposed development site.

Desk studies were carried out to obtain relevant existing biodiversity information within the ZOI. The assessment extends beyond the immediate development area to include those species and habitats that are likely to be impacted upon by the project. Details of the proposed development are seen in Chapter 2 of the EIAR.

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 outlines measures to alleviate identified impacts.

A separate Appropriate Assessment Screening, in accordance with the requirements of Article 6(3) of the EU Habitats Directive, has been produced. It was determined that "*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.*" A Preliminary Construction Management Plan has been prepared by DBFL.

7.1.1. Methods for the Ecology Assessment

A pre-survey data search was carried out. This included examining records and data from the National Parks and Wildlife Service, National Biological Data Centre, the Environmental Protection Agency, in addition to aerial, 6 inch maps and satellite imagery. A detailed desktop review and field surveys were carried out, initially in November 2019, with additional site visits up to April 2020 as outlined in Table 7.1. All ecological elements were carried out by Bryan Deegan MCIEEM.

Proximity to designated conservation sites and habitats or species of conservation interest

Designated conservation sites within 15km of the site outline were studied. This included sites of National importance ((Natural Heritage Areas (NHA), proposed Natural Heritage Areas (pNHA) and Ramsar sites in addition to Natura 2000 sites (Special Areas of Conservation (SAC) and Special Protection Areas (SPA)).

Up to date GIS data (National Parks and Wildlife Service (NPWS) WMS data in addition to shapefiles) were acquired and plotted against 5, 10 and 15km buffers from the proposed development site. Where there was a potential for the ZOI to be influenced by natural biodiversity corridors e.g. rivers or woodland these were also take into account and assessment extended. A data search of rare and threatened species within 5km of the proposed site was provided by NPWS. Additional information on rare and threatened species was researched through the

National Biodiversity Data Centre maps data search and previous planning applications in the vicinity.

Habitats, Flora 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, in addition to aerial, 6 inch, satellite imagery. Following the desktop study, a walk-over assessments of the site was carried out on the 10th March 2020 and on the 16th April 2020. Habitat mapping was carried out according to Fossitt (2000) using AcrGIS 10.5 and displayed on Bing satellite imagery. Flora assessment was carried out on the 16th April 2020. Any rare or protected species were noted. Two transects of 200m long were carried out along treelines within the site and bird species seen or heard within 100m of the recorder were noted. Additional observations were noted on species within the fields and additional records were noted. A survey for mammals was carried out by means of a thorough search within the study area. The presence of mammals is indicated principally by their signs, such as resting areas, feeding signs or droppings - though direct observations are also occasionally made. The survey also included search for habitats suitable for amphibians and reptiles.

The nature and type of habitats present are also indicative of the species likely to be present; the habitats present were assessed in general accordance with techniques adopted for the Badger & Habitat Survey of Ireland (Smal, 1995) and habitats listed by Fossitt (2000). The field survey was supplemented by an evaluation of relevant literature and existing information. Survey for mammals was conducted in March, within the appropriate season for badger *Meles meles* surveys. Badger surveys are best conducted in winter (December to April, with optimum period mid-January to April). Survey for amphibians is best conducted in spring (late February to late March) when breeding sites can be identified.

Bat Fauna

A bat assessment was undertaken on 16th April 2020 by Bryan Deegan, within the optimal survey period. The onsite habitats were visually assessed for their favourability for bats and the site survey was supplemented by a review of Bat Conservation Ireland's (BCIreland) Bat Records Database. No artificial structures were present on site that would be of bat roosting potential. Onsite trees were assessed for their bat roosting potential. The presence of bats is often shown by grease staining, droppings, corpses, feeding signs such as invertebrate prey remains and/or the presence of bat fly Nycteribiidae pupae, although direct observations are also occasionally made. The site survey was supplemented by a review of Bat Conservation Ireland's (BCIreland) National Bat Records Database. The bat assessment was undertaken within the active bat period (March – October) when a detector survey is possible. Temperatures were 10°C after sunset that at night. Winds were light and there was no rainfall.

Invasive Species

On the 20th April 2020 the proposed development site was surveyed and an assessment carried out for the presence of invasive species that are listed under the European legislation, the Birds and Natural Habitats Regulations 2011 (SI 477 of 2011) , Section 49(2) which prohibits the introduction and dispersal of species listed in the Third Schedule whereby "any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow [….] shall be guilty of an offence."

Difficulties Encountered

No difficulties were encountered in relation to the preparation of the Biodiversity chapter of the EIAR. The second fieldwork date was in the initial stages of the Covid 19 pandemic. The site survey was carried out on site by a single outdoor fieldworker with no contact with any other person.

7.2 The Development

The proposed development will provide a c. 30,869sq.m (GFA) mixed-use development within 4 No. blocks on a site of c. 2.98ha. The development will provide 359 No. units in a mix of 1 and 2 bed apartments, including 3 No. single storey mews houses. The development will also provide associated residential amenity facilities and a community centre.

The proposed development will also include hard and soft landscaping, boundary treatments, public lighting, ESB substations, plant and switch rooms, and residential waste facilities, piped site wide services, and all ancillary works and services necessary to facilitate construction and operation. The development will be served by a vehicular access from Stocking Avenue on the southern side of the site.

7.2.1 Proximity to Designated Conservation Sites and Habitats or Species of Conservation Interest

As can be seen from Figures 7.1 to 7.6 there are no conservation sites within one kilometre of the proposed development site. The distance and details of the Natura 2000 sites (SAC & SPA) within 15km and NHA (including pNHA's) within 10km of the proposed development are seen in Table 7.2. There is an indirect pathway to the River Dodder via the public surface water network. It should be noted that no species of conservation importance were noted on site, based on NPWS and NBDC records. The common frog (*Rana temporaria*) was noted by NPWS 500m to the west of the site. The Irish Stoat (*Mustela erminea subsp. Hibernica*) and common frog (*Rana temporaria*) were noted in the 1km^2 grids to the south. No species of conservation importance were noted by NBDC within or in the vicinity of the site.

Site Code	Conservation Site	Distance
SAC		
IE0001209	Glenasmole Valley SAC /pNHA	4.0 km
IE0002122	Wicklow Mountains SAC	4.2 km
IE0000210	South Dublin Bay SAC/pNHA	8.7 km
IE0001209	Knocksink Wood SAC	9.5 km
IE000713	Ballyman Glen	12.1 km
IE0000206	North Dublin Bay SAC/pNHA	13.1 km
IE0003000	Rockabill to Dalkey Island SAC	14.6 km
SPA		
IE0004040	Wicklow Mountains SPA	3.9 km
IE0004024	South Dublin Bay and River Tolka Estuary SPA	8.6 km
IE0004006	North Bull Island SPA/Ramsar	13.2 km
IE0004172	Dalkey Islands SPA	14.4km
Other pNHA's		
000991	Dodder Valley	2.4 km
001209	Glenasmole Valley	4.2 km
001753	Fitzsimon's Wood	4.9 km
001212	Lugmore Glen	6.4 km
002104	Grand Canal	6.6 km
001202	Ballybetagh Bog	8.8km
000211	Slade of Saggart and Crooksling Glen	8.8 km

001207	Dingle Glen	9.2 km
000210	Booterstown Marsh & South Dublin Bay	8.5 km
000725	Knocksink Wood	9.3 km
002103	Royal Canal	9.5 km
001755	Glencree Valley	9.7 km

Table 7.2. *Proximity to designated sites of conservation importance*.

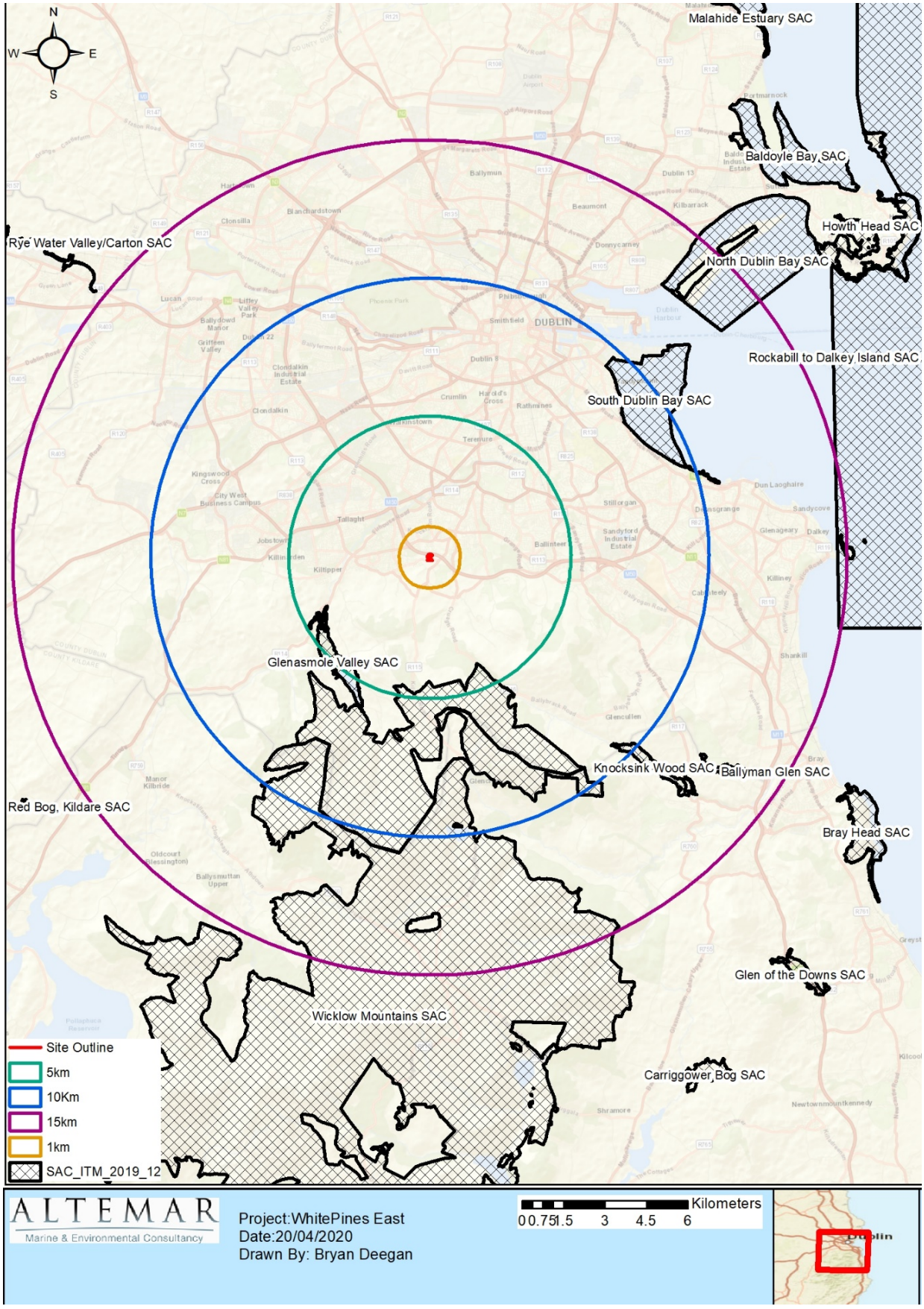


Figure 7.1. Special Areas of Conservation within 15km of the proposed development.

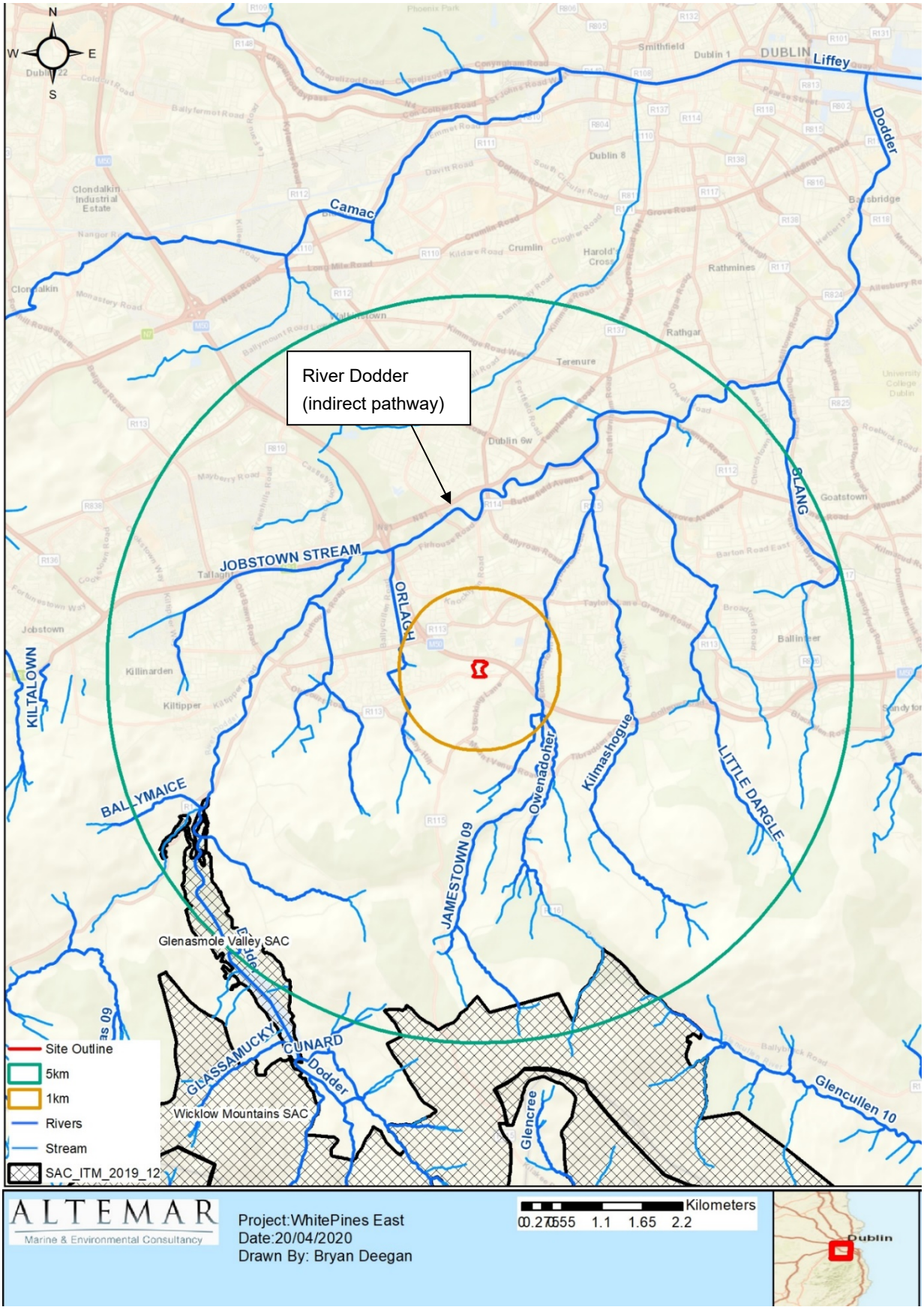


Figure 7.2. Special Areas of Conservation with hydrological connection.

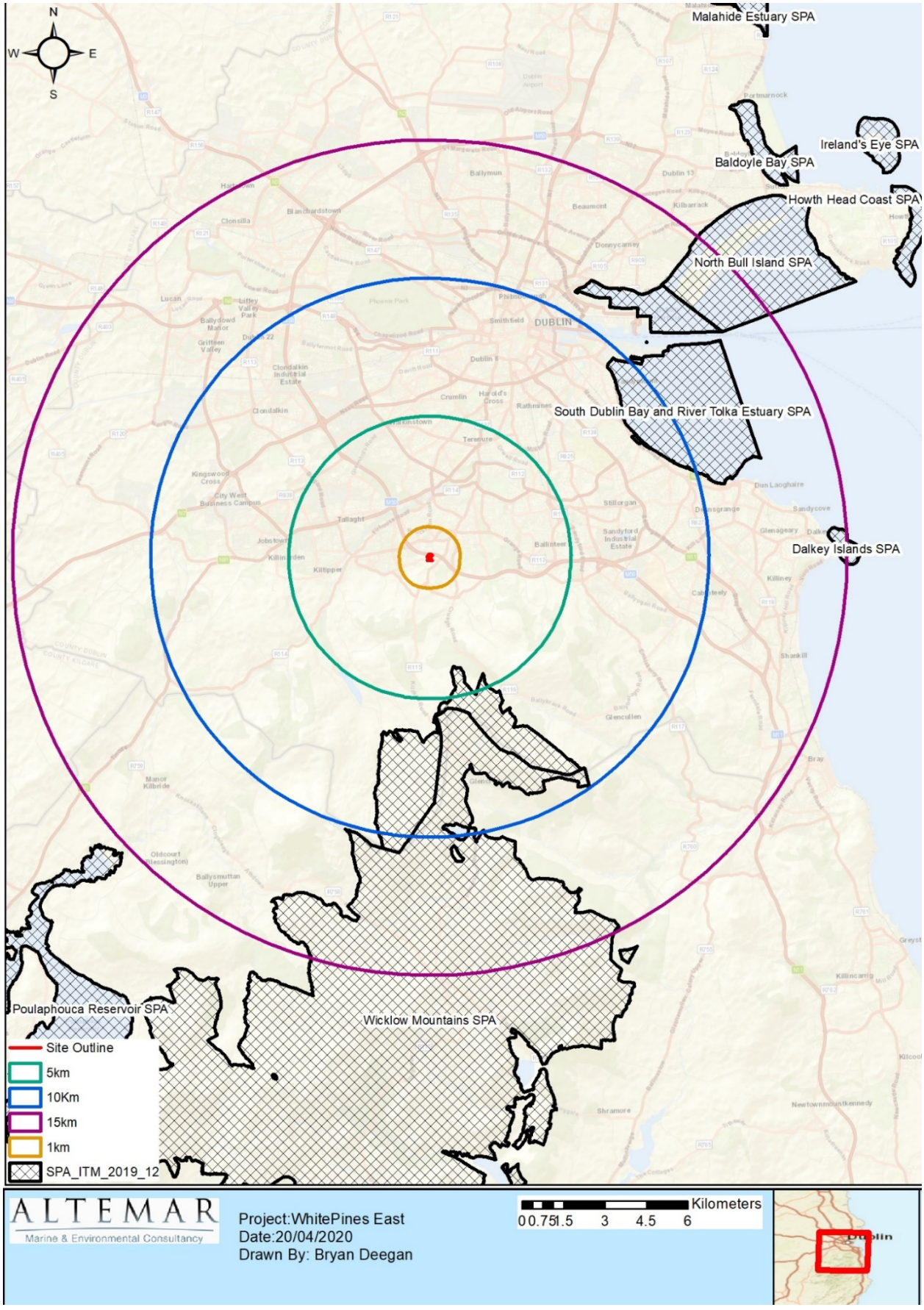


Figure 7.3. Special Protection Areas within 15km of the proposed development.

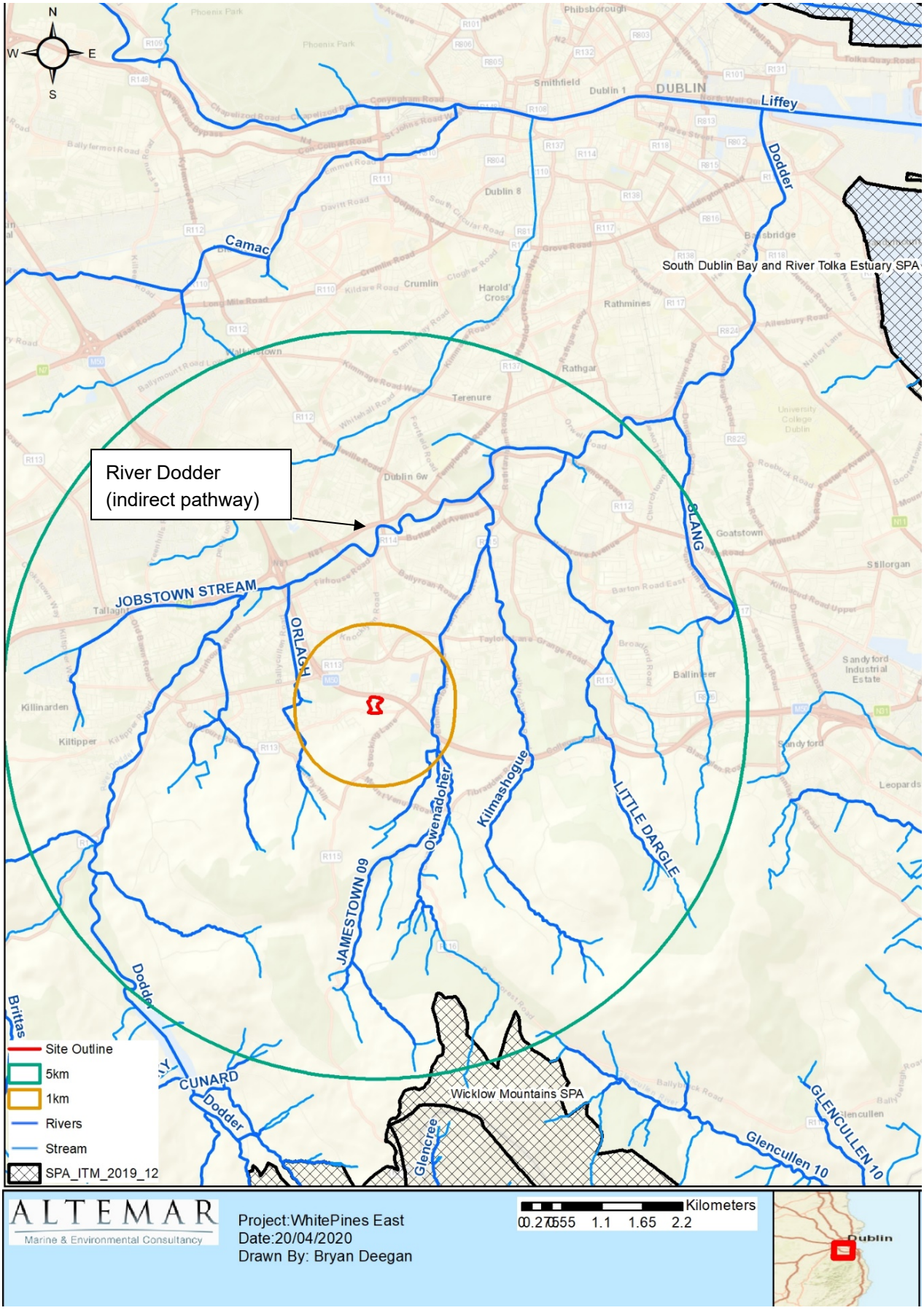


Figure 7.4. Special Protection Areas with hydrological connection.

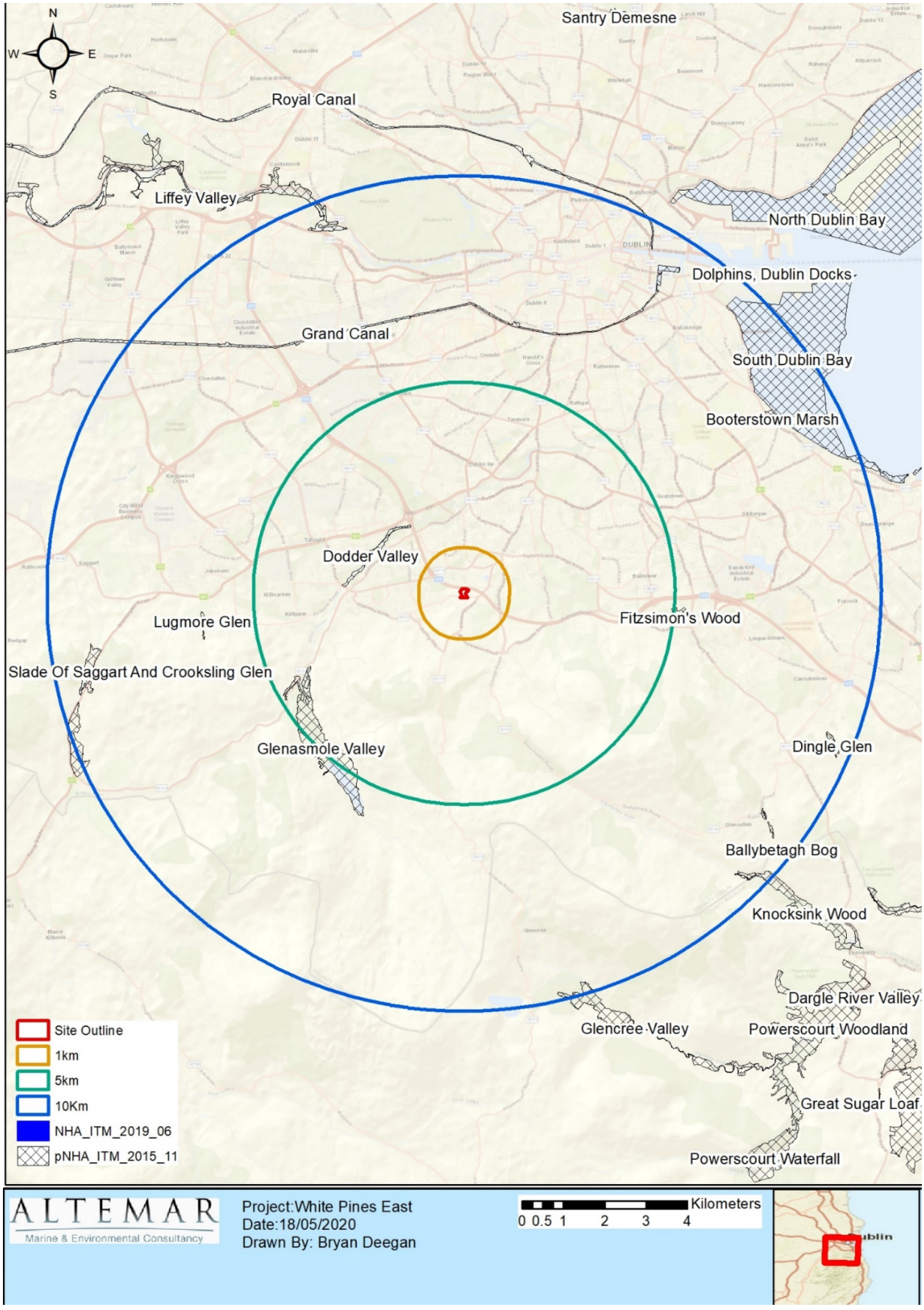


Figure 7.5. pNHA and NHA (none) within 10km of the proposed development.

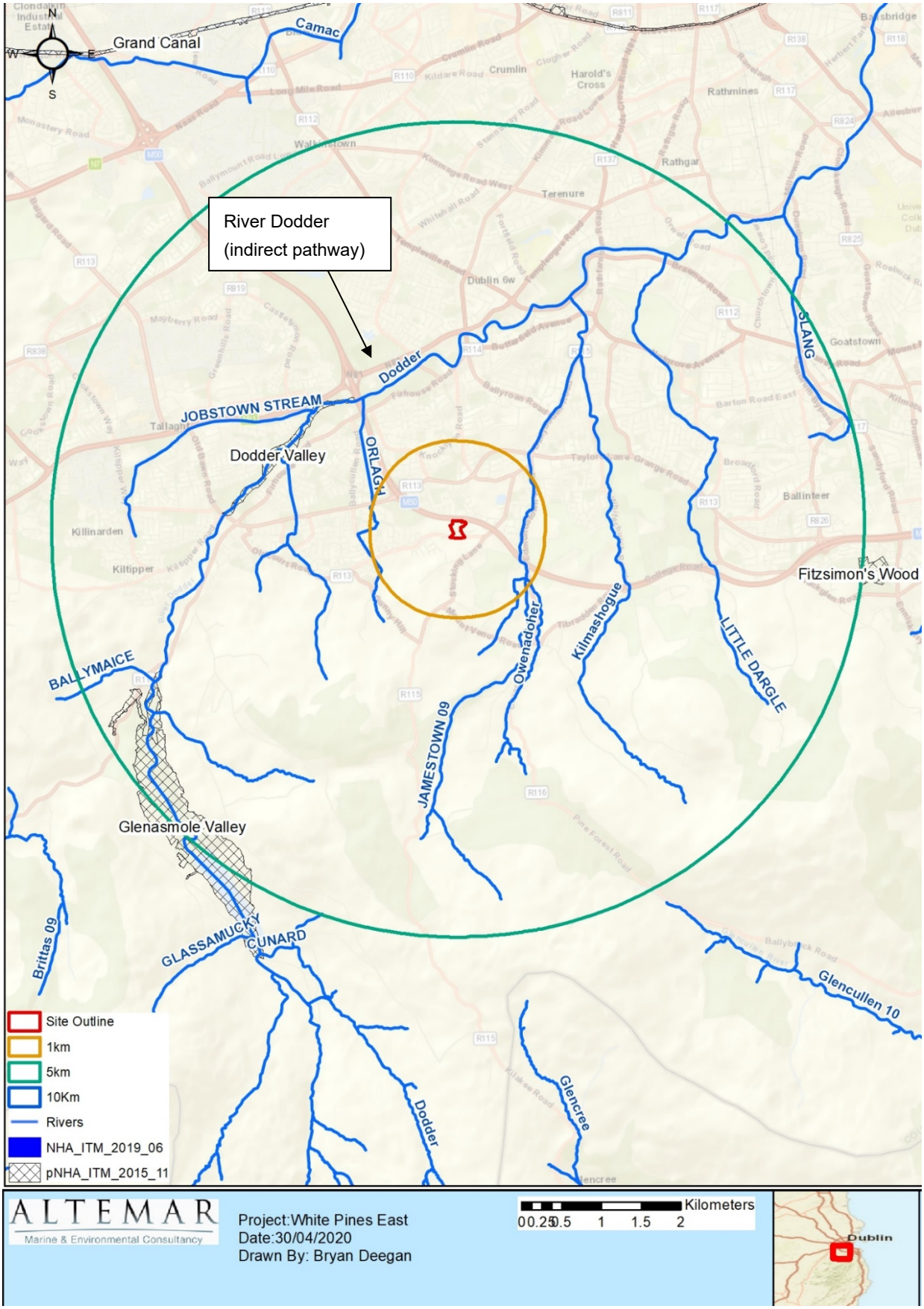


Figure 7.6. Hydrological connections to pNHA and NHA with within 5km.

7.2.2 Terrestrial Habitats, Flora and Avian Ecology

The proposed development area was surveyed on the 10th March 2020 and the 16th April 2020.
Habitats: Habitats encountered were classified according to Fossitt (2000) and are seen in Figure 7.7, based on the site visits in March and April 2020. Distinct habitats were noted and species detailed.

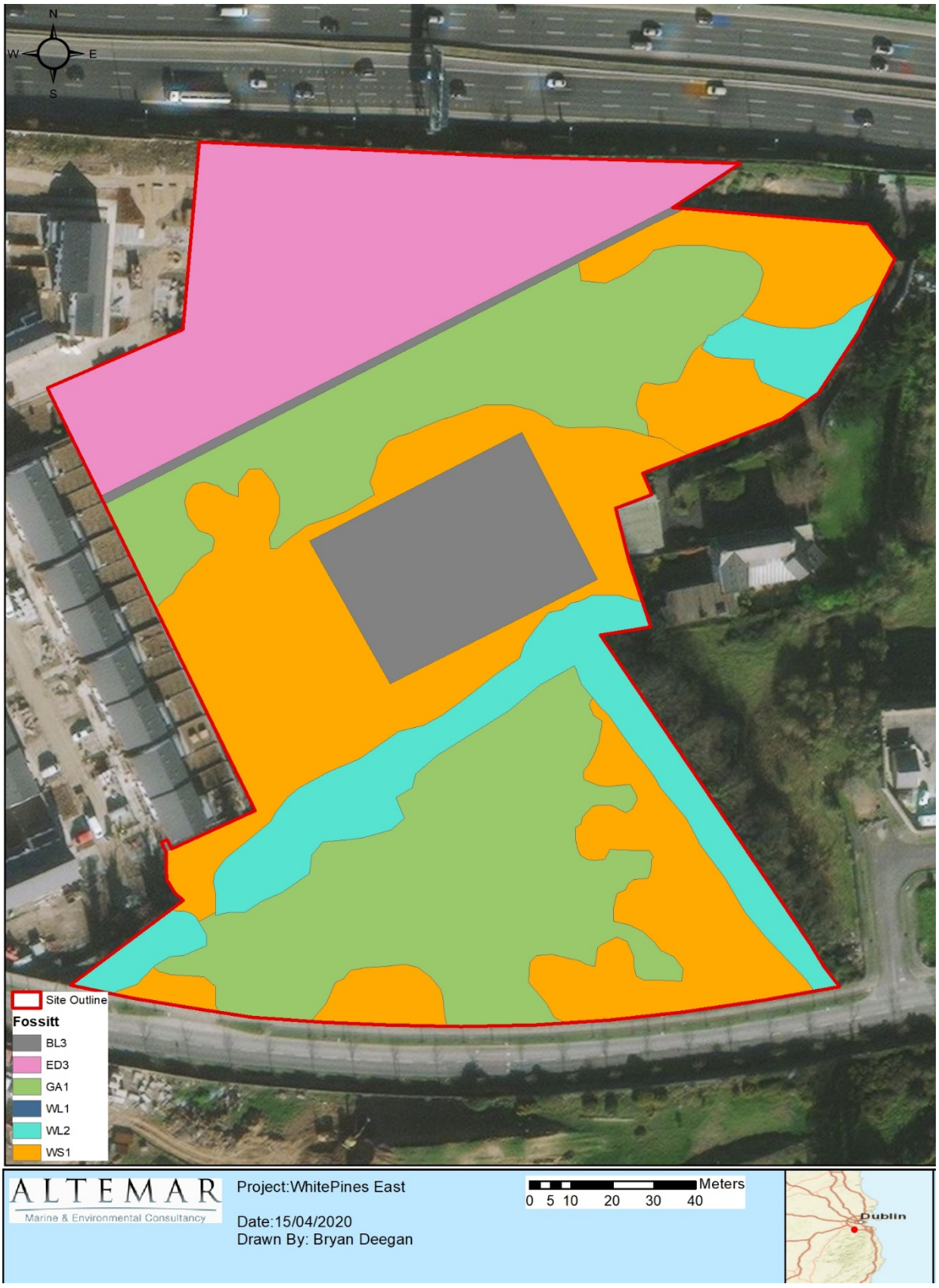


Figure 7.6. H*abitats referred to in the text Fossitt (2000) terminology.*

Fossitt	Habitat and species description	
BL	**BL-Built Land** No buildings were on site. However, there was an area of hardstanding in the northern field that had begun to be colonised by plants. No species of conservation importance were noted in these areas. Species included bramble (*Rubus fruticosus agg.*), lesser celandine (*Ficaria verna ssp verna*), dandelion (*Taraxacum spp.*), creeping buttercup (*Ranunculus repens*), plantains (*Plantago spp.*), nettle (*Urtica dioica*), thistles (*Cirsium arvense, C. vulgare*), docks (*Rumex spp.*), mosses, rosebay willowherb (*Epilobium angustifolium*), clovers (*Trifolium sp.*), butterfly-bush (*Buddleja davidii*), winter heliotrope (*Petasites pyrenaicus*) in addition to sycamore (*Acer pseudoplatanus*) and ash (*Fraxinus excelsior*) saplings.	
GA1	GA1-Improved agricultural grassland The majority of the proposed development site is species-poor agricultural grassland that is suffering from scrub encroachment (gorse (Ulex sp) and bramble (*Rubus fruticosus agg.*)). The northern field is currently being grazed by horses. that is currently being grazed by cattle. Species observed included creeping buttercup (*Ranunculus repens*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), bramble (*Rubus fruticosus*), dandelion (*Taraxacum spp.*), daisy (*Bellis perennis*), plantains *Plantago spp.*), thistles (*Cirsium vulgare*), docks *(Rumex spp.*), greater stitchwort (Stellaria holostea) lesser celandine (*Ficaria verna ssp verna*), butterfly-bush (*Buddleja davidii*), and nettle (*Urtica dioica*).	 (

Fossitt	Habitat and species description	
WS1	WS1-Scrub Two distinct areas of scrub were noted on site. In the southern field this was dominated by (gorse (Ulex sp), butterfly-bush (Buddleja davidii) and bramble (*Rubus fruticosus agg*.) which was encroaching on to the grassland. In the northern field this area was dominated by butterfly-bush (*Buddleja davidii*). Other species in this area included the species observed within the BL above.	
GA2	ED3 Recolonising bare ground On the northern portion of the site is a large area of fenced land that has recently been totally cleared. Species observed included Rape (Brassica napus), creeping buttercup (*Ranunculus repens*), white clover (Trifolium *repens*), red clover (*Trifolium pratense*), bramble (*Rubus fruticosus*), dandelion (*Taraxacum spp*.), daisy (*Bellis perennis*), plantains (*Plantago spp*.), thistles (*Cirsium vulgare*), docks (*Rumex spp*.) and nettle (*Urtica dioica*).	
WL2	WL2- Treelines The most dominant feature of the site are the two treelines on the eastern and northern perimeter of the southern field. Species in the eastern treeline (majority to be retained) include numerous large and mature pedunculate oak (*Quercus robur*). The lower treeline between the two fields on site which is to be removed included mature ash (*Fraxinus excelsior*) and Sycamore (*Acer pseudoplatanus*). Other species in the treeline included bramble (*Rubus fruticosus agg*.), honeysuckle (*Lonicera periclymenum*), holly (*Ilex aquifolium*), elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*), common dog-violet (*Viola riviniana*), greater stitchwort (*Stellaria holostea*), scrambling roses (*Rosa spp.)*, hedge bindweed (*Calystegia sepium*),	 cleavers (*Galium aparine*), gorse (*Ulex s*p), ramsons (*Allium ursinum*), lords and ladies (*Arum maculatum*), cow parsley (Anthriscus sylvestris) and wild carrot (Daucus carota). A bat survey revealed bats foraging along the eastern treeline with several trees of bat roosting potential primarily due to dense and thick growth of ivy (Hedera helix). A large ash had several broken limbs which increased its bat roosting potential.

Table 9.4. *Terrestrial habitats and floral species composition.*

No flora species or habitats of National or international conservation importance were noted during the surveys. As previously discussed no flora species of conservation importance were noted on site by the NPWS, NBDC.

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. As a result, there are no terrestrial or aquatic invasive species such as Japanese knotweed, giant rhubarb, Himalayan balsam, giant hogweed etc. that could hinder removal of soil from the site during groundworks.

Avian Ecology

Eleven bird species were noted during the onsite surveys (Table 7.5). The bird species noted are typically associated with the habitat ranges seen on site. No bird species that are listed on Annex I of the EU Birds Directive were seen on site during any of the survey work.

Common Name	Scientific Name	Conservation Status
Woodpigeon	*Columba palumbus*	Green
Hooded Crow	*Corvus cornix*	Green
Rook	*Corvus frugilegus*	Green
Jackdaw	*Corvus monedula*	Green
Blue Tit	*Cyanistes caeruleu*	Green
Robin	*Erithacus rubecula*	Green
Great Tit	*Parus major*	Green
Coal Tit	*Periparus ater*	Green
Wren	*Troglodytes troglodytes*	Green
Blackbird	*Turdus merula*	Green
Magpie	*Pica pica*	Green

Table 7.5. *Species of Birds noted during on-site surveys.*

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 data.

Discussion Terrestrial Flora, Avian Fauna and Habitats

As can be seen from Figure 7.7 the proposed development site consists mainly of Improved Agricultural Grassland (GA1) which is being encroached by scrub. The northern area of the site has built land and grassland which is also being encroached by scrub, but dominated more by Buddleja sp. Treelines (WL2) were also seen. The majority of the dominant oak treeline in the south east of the site is to be retained. No flora species or habitats of National or international conservation importance were noted during the surveys. As previously discussed, no flora species of conservation importance were noted on site by NPWS, or NBDC. However, as noted above, in relation to bird species no bird species on Annex I of the EU Birds Directive were noted on site by NPWS or NBDC.

7.2.5 Bats

A bat survey of the proposed development site was carried out by Bryan Deegan on the 16th April 2020. As outlined in Appendix 7.1 “The older, tall trees surrounding the adjoing residence known as Green Acre are the most important onsite features for bats as they provide sheltered foraging areas and screening from the surrounding artificial lighting of the nearby urban environment.”

7.2.6 Terrestrial Fauna

Mammals

Badgers are protected under the Irish Wildlife Acts. No active badger setts were found on site and there were no signs of badger presence – such as rooting signs (foraging), latrines (defecation sites) or footprints. No mammals of conservation importance were noted on site.

Amphibians and reptiles:

Frogs and newts are widespread in Ireland, breeding in pools and drains. Both species are relatively widespread in Ireland but are of conservation interest (Marnell, 1994, 1998). The habitats on site are poor for these species with no areas of water or wet ditches on site. No amphibians or reptiles were noted on site either during the onsite surveys on based on historical NPWS or NBDC records.

7.3 Assessments of Impacts

This section of the EIAR examines the potential causes of impact that could potentially result in negative effects arising on the species and habitats that occur within the ZOI of the proposed development. These impacts could arise during either the construction or operational phases of the project. The following terms are derived from EPA EIAR Guidance and are used in the assessment to describe the predicted and potential residual impacts on the ecology by the construction and operation of the proposed development.

Quality of Potential Impacts on Biodiversity

	Impact Description
Negative /Adverse Impact	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Neutral Impact	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Positive Impact	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).

Significance of Impacts

Significance of Impact	Description of Potential Impact
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable2 changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound	An impact which obliterates sensitive characteristics.

Duration of Impact

Duration of Impact	Description
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year
Short-term	Effects lasting one to seven years.
Medium-term	Effects lasting seven to fifteen years.
Long-term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

Probability of Effects	Description
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Extent of Effects	Description
Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.

7.3.1 Evaluation of Impact

Construction Impacts

As discussed previously in Chapter 2 the proposed development site is zoned New Residential' in the South Dublin County Council Development Plan 2016-22.

The proposed construction of a residential development could 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. Potential Impacts are assessed below for each of the ecological components:

Designated Conservation sites

Due to the distance from designated conservation sites i.e. a minimum of 2.4 km from the proposed development (3.9 km for Natura 2000 sites), with no intact terrestrial biodiversity corridor, the principle vector for potential impact to conservation sites lies via the surface water drainage to the River Dodder via the public surface water network. However, impacts could arise from runoff during site re-profiling, installation of attenuation tanks and ground works, that could impact on the surface water network and River Dodder, with downstream impacts to Dodder Valley pNHA, 2.4 km downstream of proposed development. Standard onsite construction and operational measures will be in place to ensure compliance with the Water Pollution Acts. In addition, the project has to comply with SUDS, County Council requirements and the provision of additional measures such as petrochemical interceptors and silt interception. Due to the distance between the proposed development site to designated conservation sites (min 2.4 km), lack of direct hydrological connection to nearby conservation sites and the requirement for

compliance with Water Pollution Acts in relation on site works, no impact is foreseen in relation to designated conservation sites. An AA Screening has been submitted with this planning application. It concluded 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. In addition, no in-combination effects are foreseen."

Impacts: Neutral/Imperceptible/Temporary/localised/unlikely. Standard controls are required.

Aquatic Ecology / Invasive Species

Due to the salmonid nature of the River Dodder and the presence of Atlantic salmon (*Salmo salar*) and European eel (*Anguilla Anguilla*) and the indirect pathway via the public surface water network, standard on site measures should be in place to ensure compliance with Water Pollution Acts. No invasive species were noted on-site and as a result, the construction works would not impact on the presence of invasive species on-site. Movement of soil will not be impacted as no invasive species were present on site.

Impacts: Negative/Slight/Short-term, unlikely, localised. Mitigation is required.

Habitats, Botany and Avian Ecology

The impact of the development during construction phase will be a loss of habitats and species in the vicinity of the treelines, scrub and agricultural grassland. It would be expected that the avian fauna associated with these habitats would also be displaced. No flora or habitats of conservation importance were noted during the surveys.

During the site visits no bird species of conservation importance as listed on Annex I of the EU Birds Directive were recorded. The most significant impact to birds will be during the construction phase with the permanent removal of any mature trees and to a lesser extent the levelling of the land to accommodate the houses.

Construction Phase Impact: Negative/ Slight to Moderate/ Short-term*, localised, unlikely*. *Mitigation is required*.

Bat Fauna

As outlined in Appendix 7.1, "As no evidence of a bat roost was noted in any of the onsite, no mitigation measures in regard to these animals are needed during the proposed works. There is also no requirement for a National Parks and Wildlife Service derogation licence application to allow the planned works. Although mitigation measures are not required, as a precaution, as bats are using the treeline as a foraging corridor it is recommended that lighting of this area follows bat lighting guidance . and that a preconstruction survey is carried out on the large trees of bat roosting potential that are to be removed from the site."

Impacts: Negative; Slight; Temporary, localised

Terrestrial Fauna

Common species

Loss of habitat will affect many common mammalian species and there will be mortality during construction. Protected species such as pygmy shrew and hedgehog may be directly impacted. There are limited ways to protect such species and they are common or relatively common in Ireland. Other species, such as fox and Irish hare, will be affected by loss of foraging habitat. These species move away from disturbance and mortality during construction is not expected or will not be significant.

Minor Negative on common species in the immediate locality. Not Significant

Protected Mammals

No signs of protected species of mammals were observed on site. There are no records of protected mammals on site. The site is isolated and surrounded by roads on all sides.

Impacts on protected mammals in the locality, regionally, and nationally: Not Significant.

Amphibians and reptiles

Frogs may occur on site on site as they have been located 500m from the site. The pasture grassland habitats on site are not ideal for frogs but can provide foraging habitat for this species. However, there are no watercourses, drains or pools on site. Newts are not expected on site. Common lizard is also protected and there would be some limited loss of foraging and breeding habitat for this species.

Expected impacts on amphibians and reptiles in the locality, region and nationally: Minor Negative/Slight.

Potential impacts on surrounding areas

The proposed development is expected to have Minor Negative/Not Significant impact on the wildlife in agricultural areas and urban areas in the locality. Without the implementation of standard construction phase controls including silt interception, there could be impacts on aquatic species the River Dodder. However, it would be expected that significant dilution and mixing would take place in the surface water network prior to reaching the River Dodder.

Operational Impacts

Impacts of Landscaping

It is proposed to retain the treeline on the eastern side of the development. In addition, as outlined in the lighting plan, in order to limit the potential impacts of lighting from the development on the fauna associated with the eastern treeline, in particular bat species, low light spill has encouraged in this area and no lighting will take place along the treeline. Following construction of the housing and associated roads the planting of trees and landscaping will also be carried out. In January 2021 discussions took place between the landscape architects and Altemar to improve the biodiversity value of the site. This revision involved the inclusion of native biodiversity enhancement principles across the site which will further enhance the biodiversity value of the scheme.

Operational Impacts: Positive, Slight to Moderate*, localised, unlikely*; Permanent.

Designated Conservation sites within 15km

During operation of the development foul water will be discharged to online mains services. Runoff from the development and roads will have to comply County Council and SUDS requirements and will be attenuated and discharged at greenfield rates to the public surface water network. As a result no negative impact on conservation sites is foreseen. The accompanying AA screening also found that no significant effects are likely for all Natura 2000 sites within 15km. No significant impacts on designated sites are likely.

Operational Impacts: None foreseen

Aquatic Ecology / Invasive Species

Petrochemical runoff from the site and road could potentially negatively directly or indirectly impact the aquatic ecology. Runoff from the development and roads will have to comply with County Council requirements and will require petrochemical interception and will be attenuated and discharged at greenfield rates to the public surface water network.

Operational Impacts: Negative, Slight *, localised, unlikely* Permanent. Mitigation required.

Habitats, Botany and Avian Ecology

During the operational phase of the development there will be an increase in disturbance including noise and light that could potentially impact on birds on site. As the landscaping elements improve with maturity it would be expected that the biodiversity value of the site to birds and flora would also increase. Landscape, light spill and habitat management will be important to overall impact of the operational phase.

Operational Impact: Neutral (positive and negative)*, localised*, Slight to Moderate; Permanent.

Bat Fauna

Loss of foraging sites and commuting habitat may temporarily displace certain species. Artificial light creates a barrier to bats so lighting of treelines should be avoided where possible. Low impact lighting has been chosen in the vicinity of the retained treeline (See 1 lux lighting contour on lighting plan.). The prosed lighting plan should not significantly impact the bat species that will utilise the retained treelines.

Operational Impact: Negative; Slight; Temporary*, localised*. Mitigation required.

Specific impacts on terrestrial fauna

Protected mammals

No protected mammal species were noted on site. It is expected that species will avoid built areas once they are constructed. Impacts may be considered as Minor Negative on species in the immediate locality. However, common species are, of course, widespread and ubiquitous and the overall impact on common species may be considered as Not Significant

Operational Impacts: Negative, Slight; Permanent*, localised, unlikely*. Mitigation may be required.

Amphibians and reptiles

No new ponds or water features are proposed that would encourage frogs within the area.

Operational Impact: Neutral*, localised,* Permanent

Cumulative Impacts

The proposed development is located on a greenfield site, which forms part of a larger area of land zoned RES-N - New/proposed residential "To provide for new residential communities in accordance with approved area plans" . Therefore it is likely that the surrounding lands will be developed further in due course. Construction on this site will create localised light and noise disturbance. 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 three retention ponds on site for the road. As outlined in the AA Screening "A search of the www.Myplan.ie online planning

was carried out. The site is an area that is undergoing development and planning. The area to the west has under gone grant of Planning SD14A/0222 (Ardstone Lands north of Stocking Avenue) and surface water drainage network has been constructed connecting the existing surface water drain under Stocking Avenue to the existing 600mm diameter surface water drain which crosses under the M50 motorway. The majority of other planning applications in the vicinity of the proposed project are small scale projects involving individual houses and small-scale developments, but it would be expected that the area would undergo development in the coming years. Given the scale of these developments and the distance to Natura 2000 sites via indirect hydrological connections via surface and foul water networks, which have existing control measures in place, no in-combination effects are foreseen from the proposed development."

Cumulative Impact: Negative; Slight; Temporary, localised. Mitigation required.

Worst Case Scenario Impacts

Impacts of Fire

Following construction of the development, fire would be seen as the main potential risk to the biodiversity, with potential downstream impacts. Petrochemical interceptors will be in place.

Flooding

See DBFL Site Specific Flood Risk Assessment for details of the flood risk to the proposals and the potential impacts. It concludes that "the proposed development is considered to have the required level of flood protection up to and including the 100 year return event."

Worst Case Scenario Impacts: Unlikely, Negative, Slight, *localised*, Temporary. Standard controls required.

Designated Conservation sites within 15km

Worst Case Scenario Impacts: Worst Case Scenario Impacts: Unlikely, Negative, Slight, *localised*, Temporary. Standard controls required.

Aquatic Ecology / Invasive Species

Worst Case Scenario Impacts: Negative, Slight, *localised*. Temporary. Standard controls required.

Habitats, Botany and Avian Ecology

Worst Case Scenario Impacts: Negative, Slight, Temporary, *localised*.

Terrestrial Fauna

Worst Case Scenario Impacts: Negative, Slight, *localised*, Temporary.

9.4 Mitigation Measures & Monitoring

Mitigation measures 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 incorporate elements outlined elsewhere in this EIAR and in the DBFL Construction Management Plan. It should be noted however, that additional measures may be incorporated into the proposed project following detailed discussions with County Council

As the main potential vector for impacts would be seen to be via the indirect pathway to the River Dodder via the public surface water connection measures should be in place to protect the biodiversity of the River Dodder and the Dodder Valley pNHA. However, there is significant dilution and mixing in the River Dodder, when it meets the River Liffey and when the River Liffey enters into its estuarine stage and Dublin Bay. Based on this mixing and dilution there would deemed to be no significant effects on the Natura 2000 sites

in the absence of controls on site. The measures outlined are not necessary for the protection of Natura 2000 sites. No additional mitigation measures are required besides those outlined below, during the construction and operational phases of the development, to protect against potential negative impacts on designated conservation sites.

Relevant Mitigation Measures outlined in the Construction Management Plan

The measures outlined below are relevant mitigation from the DEBF Construction Management Plan. The mitigation within the report is not limited to these measures.

Stripping of Topsoil

• Stripping of topsoil will be carried out in a controlled and carefully managed way

• At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas

• Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains

• Topsoil stockpiles will also be located so as not to necessitate double handling

Excavation of Subsoil Layers

• The duration that subsoil layers are exposed to the effects of weather will be minimised

• Disturbed subsoil layers will be stabilised as soon as practicable (e.g. backfill of drainage trench, construction of road capping layers, construction of building foundations and completion of landscaping)

• Stockpiles of excavated subsoil material will be protected for the duration of the works, stockpiles of subsoil material will be located separately from topsoil stockpiles

Weather Conditions

• Typical seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations with an objective of minimising soil erosion

Dust Control

• Dust suppression practices are to be implemented during stripping of topsoil layers and excavation of subsoil layers and importation of fill as outlined in Section 9 of this Preliminary Construction Management Plan

Importation of Fill

• Materials imported to site will be natural stones sourced from locally available quarries, greenfield / inert soil imported under a Waste Permit issued by the local authority; or materials that have been approved as by-products by the EPA in accordance with the EPA's criteria for determining a material is a by-product, per the provisions of article 27(1) of the European Communities (Waste Directive) Regulations, 2011.

• Imported fill materials will be granular in nature and used in the construction of road pavement foundations, drainage and utility bedding and surrounds.

• Materials will be brought to site and placed in their final position in the shortest possible time. Any imported material will be kept separate from material excavated from the site. All excavation to accommodate imported material will be precisely coordinated to ensure no surplus material is brought to site beyond the engineering requirement.

• No large or long-term stockpiles of imported fill material will be held on the site. At any time, the extent of fill material held on site will be limited to that needed in the immediate vicinity of the active work area.

• Smaller stockpiles of fill where required, will be suitably protected to ensure no sediment laden runoff enters existing surface water drains. Such stockpiles are to be located in order to avoid double handling.

Erosion and Sediment Control

• Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection, fencing and signage around specific exclusion zones and earth bunding adjacent to open drainage ditches)

• 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

• On-site settlement ponds are to include geotextile liners and riprapped inlets and outlets to prevent scour and erosion

• Surface water discharge points during the construction phase are to be agreed with South Dublin County Council's Environment Section prior to commencing works on site

Accidental Spills and Leaks

• All oils, fuels and other chemicals will be stored in a secure bunded hardstand area

• Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (when not possible carry out such activities off site)

• A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment

Concrete

• Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed of on site

• Pumped concrete will be monitored to ensure there is no accidental discharge

• Mixer washings are not to be discharged into surface water drains

Wheel Wash Areas

• Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds, debris and sediment captured by vehicle wheel washes are to be disposed off-site at a licensed facility.

Site Compound Facilities and Parking.

The exact location of the construction compound is to be confirmed in advance of commencement of the works (and agreed with South Dublin County Council).

• The construction compound will include adequate welfare facilities such as wash rooms, drying rooms, canteen and first aid room as well as foul drainage and potable water supply

• Foul drainage discharge from the construction compound will be tankered 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 protected from contamination by any construction activities or materials

• The construction compound will be enclosed by a security fence

• Access to the compound will be security controlled and all site visitors will be required to sign in on arrival and sign out on departure

• A permeable hardstand area will be provided for staff carparking

• A separate permeable hardstand area will be provided for construction machinery and plant

• The construction compound will include a designated Construction material recycling area

• A series of way finding signage will be provided to direct staff, visitors and deliveries as required

• All construction materials, debris, temporary hardstands etc. in the vicinity of the site compound will be removed off-site on completion of the works.

Additional measures to be carried out to prevent impacts on Habitats, Botany and Avian Ecology

- 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).
- Replanting of the perimeter treelines, hedgerows and wildflower meadows should be carried out with native species.
- 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.
- Removal of deciduous trees. Should any mature broadleaved tree be scheduled for removal as part of the development plans, it should first be surveyed for bat presence by a suitably experienced specialist. If bats are found, an application for a derogation licence should be made to the National Parks and Wildlife Service to allow its legal removal. Such trees should ideally be felled in the period late August to late October, or early November, in order to avoid disturbance of any roosting bats as per National Roads Authority guidelines (NRA 2006a and 2006b) and also to avoid the bird breeding seasons. Tree felling should be completed by mid-November at the latest as bats roosting in trees are very vulnerable to disturbance during their hibernation period (November – April). Trees may be removed at other times but the likelihood of encountering bats during works will be higher. Trees with ivy-cover, once felled, should be left intact onsite for 24 hours prior to disposal to allow any bats beneath foliage to escape overnight.
- Trees to be retained. Several species of bats roost in trees. Where possible, treelines and mature trees that are located immediately adjacent to planned construction areas or are not directly impacted should be avoided and retained intact. Overall impacts on these sites should be reduced through modified design and sensitivity during construction. Retained trees should be protected from root damage by machinery by an exclusion zone of at least 5 metres or equivalent to canopy height. Such protected trees should be fenced off by adequate temporary fencing prior to other works commencing.
- Boundary vegetation. Linear features such as hedgerows and treelines serve as commuting corridors for bats (and other wildlife) and the onsite boundary vegetation should be retained and/or replaced once construction ends. 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. Retention of boundary hedgerows and treelines will also serve to screen the development.

- Lighting restrictions. In general, artificial light creates a barrier to bats so lighting should be avoided where possible. Where lighting is required, directional lighting (i.e. lighting which only shines on work areas and not nearby countryside) should be used to prevent overspill. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvers and shields to direct the light to the intended area only. Mature trees should not be directly lit during construction or operation of the proposed development.
- A Biodiversity Management Plan has been prepared in consultation with Mitchell & Associates and outlines the landscape strategy that has been implemented to promote biodiversity on site. This includes the enhancement measures such as selecting pollinator friendly and native plants to provide a diverse foraging resource for insects, bird and bats. In addition, 15 bird boxes and 5 bat boxes will be placed on site as an enhancement measure.

Residual Impacts

None of the Natura 2000 sites (SAC & SPA) are within the potential Zone of Influence of this development. The nearest conservation site with a hydrological connection (Dodder Valley pNHA via public surface water network) to the site is 2.4 km downstream from the proposed development. No intact terrestrial biodiversity corridors connect the development area to a designated conservation site. The development footprint is dominated agricultural grassland and scrub habitat. The majority of the oak treeline will be retained. The ash and sycamore treeline across the centre of the site will be removed.

The successful implementation of a the CMP and additional measures outlined in theis chapter of the EIAR would be seen as important elements to the successful mitigation/offsetting of the loss of biodiversity on site.

The proposed development has satisfactorily addressed the current ecology on site into its design so that application of the mitigation measures outlined in this EIAR will help reduce its impact on the local ecology to an adequate level. It is felt that where possible biodiversity enhancement measures have been retained and implemented into design to enhance the overall biodiversity value of the site. The overall impact on the ecology of the proposed development will result in a long term slight neutral residual impact on the existing ecology of the site and locality overall. This is primarily as a result of the loss of terrestrial habitats on site, supported by the creation of additional terrestrial biodiversity features, mitigation measures and a sensitive native landscaping strategy.

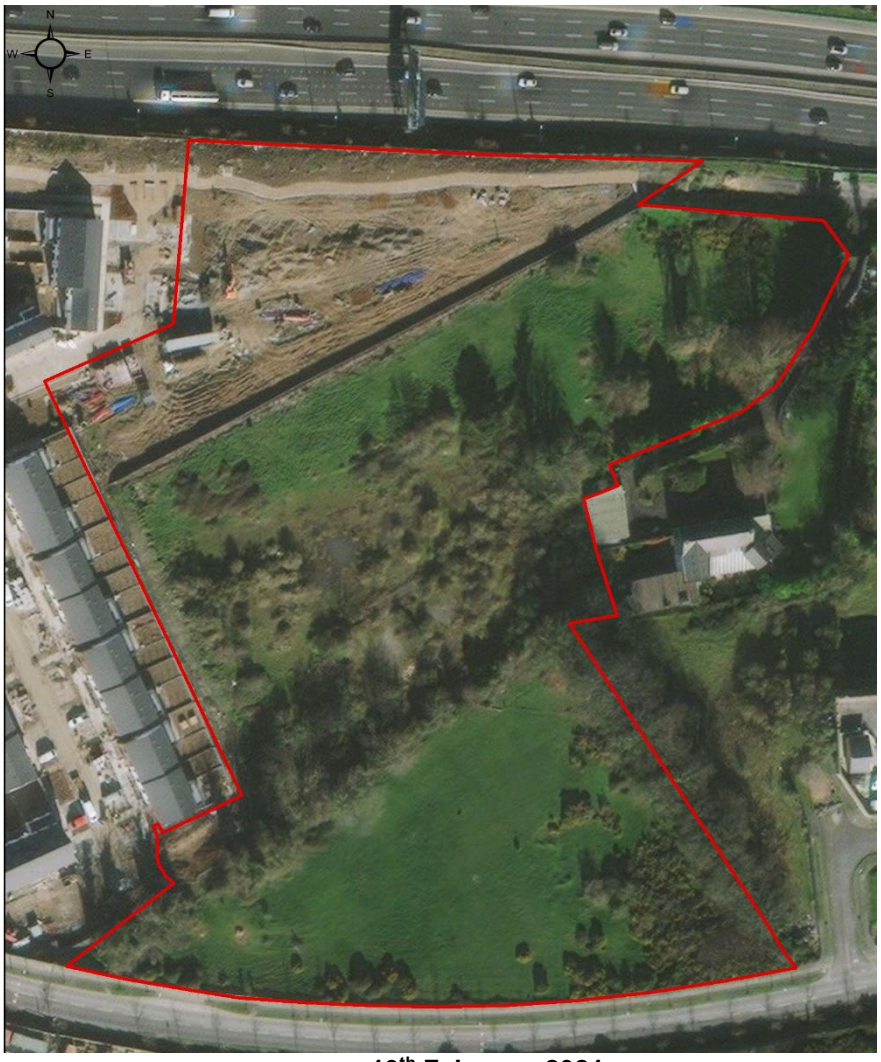
7.4 REFERENCES

1. Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities March 2010.
2. Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities, Department of the Environment, Heritage and Local Government 2009; http://www.npws.ie/publications/archive/NPWS_2009_AA_Guidance.pdf
3. Managing NATURA 2000 Sites: the provisions of Article 6 of the Habitats Directive 92/43/EEC, European Commission 2000; http://ec.europa.eu/environment/nature/Natura2000/management/docs/art6/provision_of_art6_en.pdf
4. Assessment of Plans and Projects Significantly Affecting NATURA 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC; http://ec.europa.eu/environment/nature/Natura2000management/docs/art6/Natura_2000_assess_en.pdf
5. Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission; http://ec.europa.eu/environment/nature/Natura2000/management/docs/art6/guidance_art6_4_en.pdf
6. Guidance document on the implementation of the birds and habitats directive in estuaries and coastal zones with particular attention to port development and dredging; http://ec.europa.eu/environment/nature/Natura2000/management/docs/guidance_doc.pdf
7. The Status of EU Protected Habitats and Species in Ireland. http://www.npws.ie/publications/euconservationstatus/NPWS_2007_Conservation_Status_Report.pdf
8. NPWS (2016) Conservation objectives for Glenasmole Valley SAC [001209]. Generic Version 5.0. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
9. NPWS (2016) Conservation objectives for Wicklow Mountains SAC [002122]. Generic Version 5.0. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
10. NPWS (2016) Conservation objectives for Rye Water Valley/Carton SAC [001398]. Generic Version 5.0. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
11. NPWS (2016) Conservation objectives for Wicklow Mountains SPA [004040]. Generic Version 5.0. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
12. SDCC online planning https://www.sdcc.ie/en/services/planning/planning-applications/
13. NPWS (2013) Conservation Objectives: Rockabill to Dalkey Island SAC 003000. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
14. NPWS (2018) Conservation objectives for Dalkey Islands SPA 004172. Generic Version 6.0. Department of Arts, Heritage and the Gaeltacht.
15. NPWS (2013) Conservation Objectives: South Dublin Bay SAC 000210. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
16. NPWS (2015) Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
17. NPWS (2018) Conservation objectives for Dalkey Islands SPA [004172]. Generic Version 6.0. Department of Arts, Heritage and the Gaeltacht.
18. NPWS (2012). Conservation Objectives: Baldoyle Bay SAC 000199. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
19. NPWS (2018) Conservation objectives for Ireland's Eye SPA [004117]. Generic Version 6.0. Department of Arts, Heritage and the Gaeltacht.
20. NPWS (2018) Conservation objectives for Howth Head Coast SPA [004113]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.
21. NPWS (2015) Conservation Objectives: North Bull Island SPA 004006. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
22. NPWS (2015) Conservation objectives for Howth Head SAC [000202]. Generic Version 1, National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
23. NPWS (2013) Conservation Objectives: North Dublin Bay SAC 000206. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
24. NPWS (2013b) Rockabill to Dalkey Island SAC (site code: 3000) Conservation objectives supporting document. -Marine Habitats and Species Version 1

Appendix I. Bat Fauna study

ALTEMAR
Marine & Environmental Consultancy

Bat fauna impact assessment for a proposed development for a proposed Strategic Housing Development at a site of 2.98 ha, at Stocking Avenue, Dublin 16.



19th February 2021

Prepared by: Bryan Deegan (MCIEEM) of Altemar Ltd.
On behalf of: Ardstone Homes Limited.

Altemar Ltd., 50 Templecarrig Upper, Delgany, Co. Wicklow. 00-353-1-2010713. info@altemar.ie
Directors: Bryan Deegan and Sara Corcoran
Company No.427560 VAT No. 9649832U
www.altemar.ie

SUMMARY

Structure:	**None**
Location:	A **site of 2.98 ha, at Stocking Avenue, Dublin 16.**
Bat species present:	None Roosting
Proposed work:	Ardstone Homes Limited intends to apply for planning permission for a Strategic Housing Development at a site of 2.98 ha.
Impact on bats:	None following mitigation in relation to lighting.
Survey by:	Bryan Deegan MCIEEM
Survey date:	16th April 2020

Contents

INTRODUCTION **29**

SITE LOCATION 29

BAT SURVEY 29

SURVEY METHODOLOGY 29

SURVEY CONSTRAINTS 31

DESCRIPTION OF THE BUILDINGS FROM THE PERSPECTIVE OF BAT HABITAT 31

BAT ASSESSMENT FINDINGS **31**

REVIEW OF LOCAL BAT RECORDS 31

STRUCTURE SURVEY 32

DETECTOR SURVEY 32

POTENTIAL IMPACTS OF PROPOSED REDEVELOPMENT ON BATS **32**

MITIGATION MEASURES **32**

PREDICTED AND RESIDUAL IMPACT OF THE PROPOSAL **32**

LEGAL STATUS AND CONSERVATION ISSUES – BATS **33**

REFERENCES **35**

Introduction

Altemar Limited was requested to carry out a bat survey of the proposed development site at Stocking Avenue, Dublin 16 (Figures 1 & 2).

The development will consist of the construction of 241 no. residential units, in 5 no. apartment blocks, ranging in height from 4-6 storeys, and 3no. three storey duplex block. The development will provide 93 no. 1 Bed and 148 no. 2 bed units, as follows;

- Block A is a 5 storey block comprising 40 units (20 no. 1 bed units; and 20 no. 2 bed units). Block A includes balconies on southern, northern and western elevations. A dedicated community building space comprising 552sq.m will also be provided on the ground floor of Block A.
- Block B is a 4 storey block comprising 34 units (18 no. 1 bed units; and 16 no. 2 bed units). Block B includes balconies on southern, southern, western and eastern elevations;
- Block C is a Part 4 Part 5 storey block comprising 43 units (21 no. 1 bed units; 22 no. 2 bed units) Block C includes balconies on southern, eastern and western elevations. Residential Tenant Amenities comprising c.171sq.m is provided at ground floor level of Block C to serve all residential units, comprising; a reception area, games space, residents lounge and gym space.
- Block D is a 5 storey block comprising 49 no units (21 no. 1 bed units and 28 no. 2 bed units). Block D includes balconies on southern, western and eastern elevations;
- Block E is a 6 storey block comprising 47 no units (13 no. 1 bed units and 34 no. 2 bed units). Block E includes balconies on southern, western, eastern and northern elevations;
- 3 no. 3 storey duplex blocks are provided to the western boundary of the site, comprising 28 no. 2 bed units. Balconies and terrace space is provided to the eastern elevation.

- Provision of 204 no. on street car parking spaces
- Omission of creche as approved under SDCC Ref. SD14A/0222;
- The main vehicular access to the scheme will be from Stocking Avenue. A second new vehicular access is proposed from White Pines North to the east.
- Provision of 401 no. bicycle parking spaces;
- All other ancillary site development works to facilitate construction, site services, piped infrastructure, ESB sub-stations, plant, public lighting, bin stores, bike stores, boundary treatments and provision of public and private open space including hard and soft landscaping, plant, provision of public and private open space areas comprising hard and soft landscaping, site services all other associated site excavation, infrastructural and site development works above and below ground.

Site location

The proposed development site is located at Stocking Avenue, Dublin 16.

Bat survey

This report presents the results of site visit by Bryan Deegan (MCIEEM) on the 16th April 2020 during which the proposed development site was inspected for signs of bat use or presence. A bat emergent and detector survey was also carried out after sunset.

Survey methodology

Survey of bat fauna was carried out by means of a thorough internal and external search of the buildings using a powerful torch (320 Lumens) – Led Lenser *H14.2 Head Torch*. The presence of bats is assessed with reference to their signs; principally staining, droppings, feeding signs such as invertebrate prey remains and the presence of bat fly *Nycteribiidae* pupae, although direct observations are also occasionally made. The nature and type of habitats present onsite are also indicative of the species likely to be present. At dusk, a bat detector survey was carried out onsite using a *Batbox Duet* heterodyne/frequency division detector to determine bat activity. Bats were identified by their ultrasonic calls coupled with behavioural and flight observations.

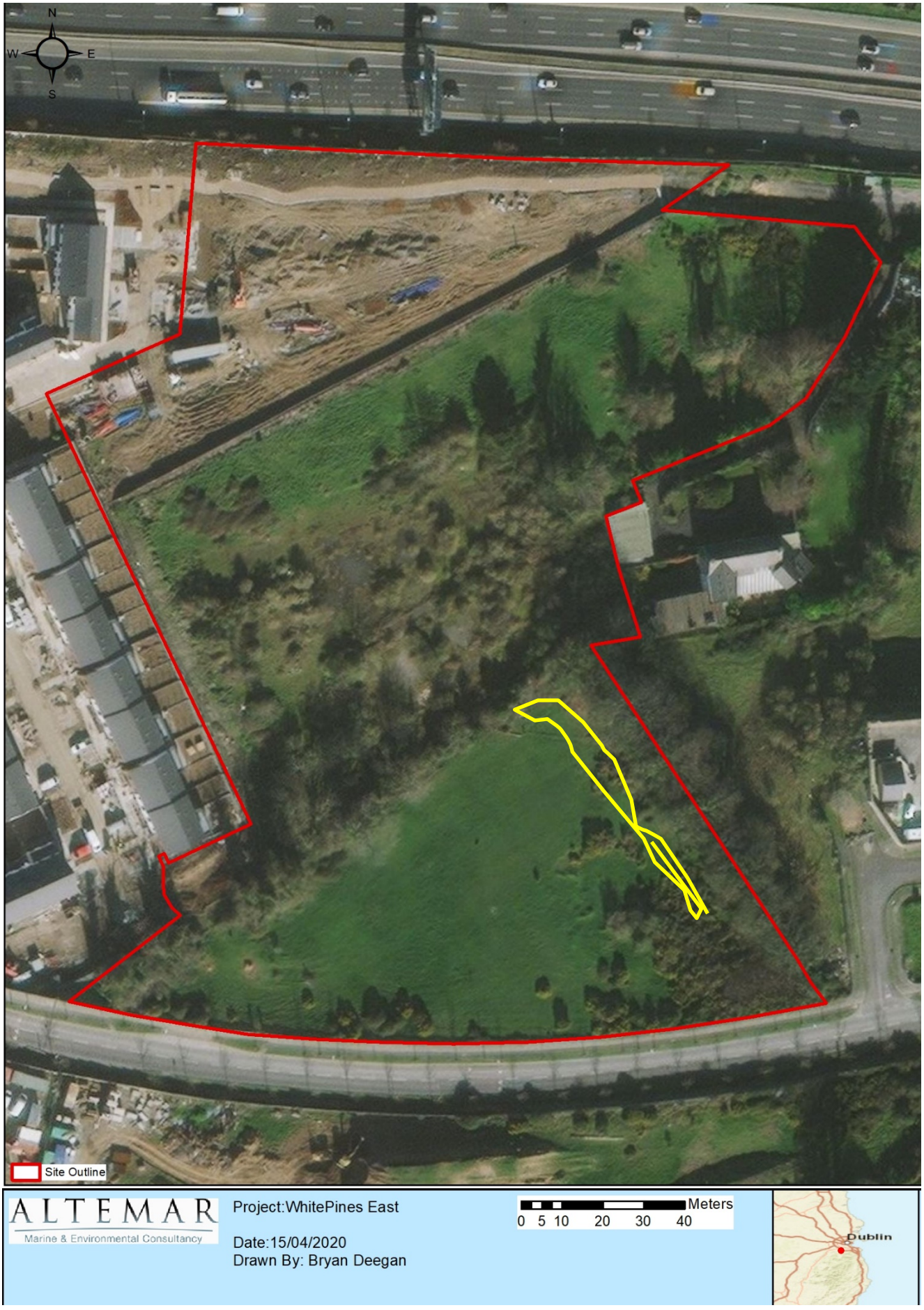


Figure 1: Site outline. (Yellow: Soprano pipistrelle foraging)

Survey constraints

The detector survey was undertaken during the active bat season in mid April (16th April). Weather conditions were good with mild temperatures of 10°C after sunset. Winds were light and there was no rainfall.

Description of the site from the perspective of bat habitat

No buildings are present on site. Potential bat roosting opportunities exist within mature onsite vegetation. Two mature treelines are present on site (Plate 1). This include areas of roosting potential due to the presence of trees with large thick ivy and a small number of trees with broken branches or hollows. The majority of trees within the large oak treeline are to be retained. One large Ash (1572) and two Oak (1574) & (1582) are deemed to be of bat roosting potential and should be assessed prior to removal.



Plate 1: Eastern pedunculate oak treeline.

Bat assessment findings

Review of local bat records

The review of existing bat records (sourced from Bat Conservation Ireland's National Bat Records Database) within a 2km of the study area reveals that one and possibly two of the nine known Irish species have been observed locally. These include a 2010 record of a pipistrelle (*Pipistrellus pipistrellus sensu lato*) (Soprano and common pipistrelle combined) 2km to the north. It is unclear form the record if this was one or two individuals (Table 1).

Table 1: Status of bat species within a 2km grid which incorporates the study location

Common name	Scientific name	Presence	Source
Common/Soprano pipistrelle	*Pipistrellus pipistrellus sensu lato* (Common pipistrelle/ soprano pipistrelle unseparated).	Present	BCIreland

Detector survey

The northern portion of the site is brightly lit from lighting from the M50 and there is little vegetation. The area in the vicinity of the treelines was darker. Two bats (Soprano pipistrelle) were detected foraging along the tall treeline. No bats were detected emerging from any of the onsite trees.

Potential impacts of proposed redevelopment on bats

No roosts or bats emerging from the onsite trees were observed. Several of the trees on site have features that would act as potential roosting areas. Of particular relevance are a large Ash (1572) and two Oak (1574) & (1582) which are to be removed.

Mitigation measures

As no evidence of a bat roost was noted in any of the onsite, no mitigation measures in regard to these animals are needed during the proposed works. There is also no requirement for a *National Parks and Wildlife Service* derogation licence application to allow the planned works. Although mitigation measures are not required, as a precaution, as bats are using the treeline as a foraging corridor it is recommended that lighting of this area follows bat lighting guidance[1]. and that a preconstruction survey is carried out on the large trees of bat roosting potential that are to be removed from the site. It should be noted that discussions took place in relation to the lighting of the treelines in relation to bat species. As outlined in the OCSC Residential Lighting Analysis report the design criteria include following “the guidelines in “Bats & Lighting, Guidance Notes for Planners, engineers, architects and developers”, issued by Bat Conservation Ireland were also taken into account in the design of lighting.” In addition key criteria included a design to “Maintain dark zones for foraging bats in areas where lighting is not necessary. However, where lighting is required, this lighting will be placed at a minimum height using the lowest lux value permitted for public health and safety.” As a result of the presence of bats near the treeline “There are no lights in close proximity to wooded areas known to contain bats, to the South-East of the development.” (Figure 2).

[1] https://www.batconservationireland.org/wp-content/uploads/2013/09/BCIrelandGuidelines_Lighting.pdf

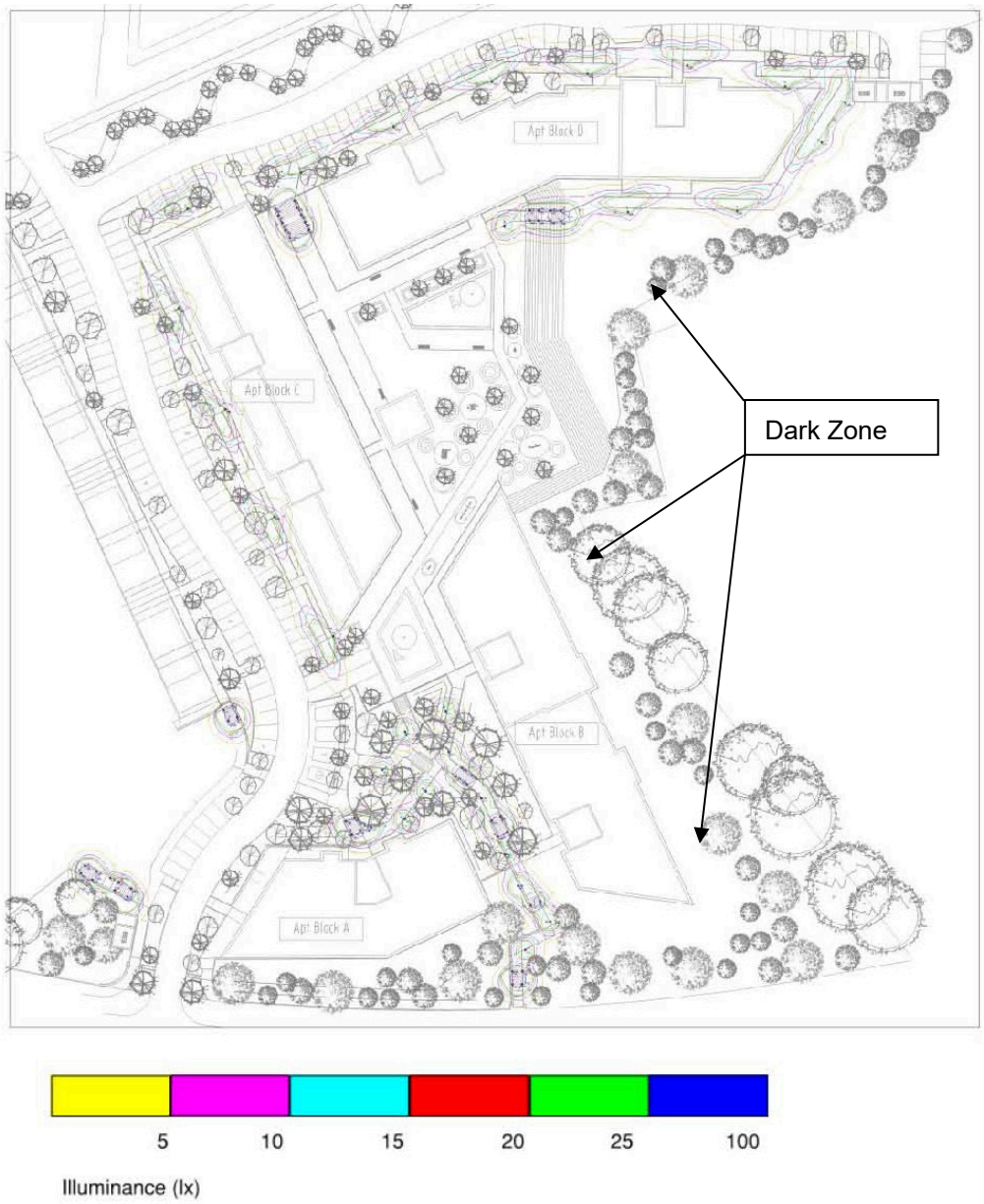


Figure 2. Light Spill Analysis from the OCSC Light Spill Analysis.

Impact of the proposal

There is no evidence of a current or past bat roost in the trees therefore no negative impacts on these animals are expected to result from the proposed redevelopment. No roosts are present within the trees. Based on compliance with bay lighting guidelines foraging will continue along the tree line to the south of the proposed development. A pre-construction of trees to be removed is recommended.

The proposed development is within an area with existing lighting. The likelihood bat collision is not significant as the materials proposed for the apartment blocks are generally solid and would have good acoustic properties to reflect echolocation signals. As a result the buildings would be clearly visible to bat species. The impact of the proposed development on bats will be negligible in the short and long term.

Legal status and conservation issues – bats

All Irish bat species are protected under the Wildlife Act (1976) and Wildlife Amendment Acts (2000 and 2010). Also, the EC Directive on The Conservation of Natural habitats and of Wild Fauna and

Flora (Habitats Directive 1992), seeks to protect rare species, including bats, and their habitats and requires that appropriate monitoring of populations be undertaken. All Irish bats are listed in Annex IV of the Habitats Directive and the lesser horseshoe bat *Rhinolophus hipposideros* is further listed under Annex II. Across Europe, they are further protected under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), which, in relation to bats, exists to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries. The Irish government has ratified both these conventions.

All Irish bats are listed in Annex IV of the Habitats Directive and the lesser horseshoe bat is further listed under Annex II.

The current status and legal protection of the known bat species occurring in Ireland is given in the following table.

Common and scientific name	Wildlife Act 1976 & Wildlife (Amendment) Acts 2000/2010	Irish Red List status	Habitats Directive	Bern & Bonn Conventions
Common pipistrelle *Pipistrellus pipistrellus*	Yes	Least Concern	Annex IV	Appendix II
Soprano pipistrelle *P. pygmaeus*	Yes	Least Concern	Annex IV	Appendix II
Nathusius pipistrelle *P. nathusii*	Yes	Not referenced	Annex IV	Appendix II
Leisler's bat *Nyctalus leisleri*	Yes	Near Threatened	Annex IV	Appendix II
Brown long-eared bat *Plecotus auritus*	Yes	Least Concern	Annex IV	Appendix II
Lesser horseshoe bat *Rhinolophus hipposideros*	Yes	Least Concern	Annex II Annex IV	Appendix II
Daubenton's bat *Myotis daubentonii*	Yes	Least Concern	Annex IV	Appendix II
Natterer's bat *M. nattereri*	Yes	Least Concern	Annex IV	Appendix II
Whiskered bat *M. mystacinus*	Yes	Least Concern	Annex IV	Appendix II
Brandt's bat *M. brandtii*	Yes	Data Deficient	Annex IV	Appendix II

Also, under existing legislation, the destruction, alteration or evacuation of a known bat roost is a notifiable action and a derogation licence has to be obtained from the *National Parks and Wildlife Service* before works can commence.

It should also be noted that any works interfering with bats and especially their roosts, including for instance, the installation of lighting in the vicinity of the latter, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by NPWS. The details with regards to appropriate assessments, the strict parameters within which derogation licences may be issued and the procedures by which and the order in relation to the planning and development regulations such licences should be obtained, are set out in Circular Letter NPWS 2/07 "*Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 - strict protection of certain species/applications for derogation licences*" issued on behalf of the Minister of the Environment, Heritage and Local Government on the 16th of May 2007.

Furthermore, on 21st September 2011, the Irish Government published the European Communities (Birds and Natural Habitats) Regulations 2011 which include the protection of the Irish bat fauna and further outline derogation licensing requirements re: European Protected Species.

References

Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) 1982

Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) 1979

EC Directive on The Conservation of Natural habitats and of Wild Fauna and Flora (Habitats Directive) 1992

European Communities (Birds and Natural Habitats) Regulations 2011 Government of Ireland, Dublin

Kelleher, C. and Marnell, F. 2007 *Bat Mitigation Guidelines for Ireland – Irish Wildlife Manuals No. 25*. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin

Marnell, F., Kingston, N. and Looney, D. 2009 *Ireland Red List No. 3: Terrestrial Mammals.* National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin

Wildlife Act 1976 and Wildlife Amendment Acts 2000 and 2010. Government of Ireland.

8.0 LAND AND SOILS

8.1 Introduction

This Chapter of the EIAR comprised of an assessment of the likely impact of the proposed development on the soils and the geological environment as well as identifying proposed mitigation measures to minimise any impacts.

In summary, the proposed development ("the site") comprises of 241 No. residential units, residential tenant amenity space (reception area, games space, residents lounge and gym) and dedicated community space on a 2.98 Ha site.

The proposed development will also include the following associated engineering infrastructure:

- Formation of an access onto Stocking Avenue to facilitate the primary vehicle access to the site (including minor modifications to existing pedestrian and cycle facilities along Stocking Avenue and relocation of a bus stop.
- Provision of internal site roads including associated footpaths.
- Provision of surface water drainage, foul drainage and water supply infrastructure.

8.2 Methodology

An assessment of the likely impact of the proposed development on soils and the geological environment included the following activities:

- Preliminary Ground Investigation Study.
- Review of information available on the Geological Survey of Ireland (GSI) online mapping service.

Preliminary Ground Investigations for the proposed development were carried out by Ground Investigations Ireland in March 2020 and included the following scope of work:

- 11 No. Dynamic Probes
- 2 No. Infiltration Tests
- 10 No. Trial Pits
- 4 No. Window Samples

Refer to Appendix 8-A for Preliminary Ground Investigation Information (GII, Project No. 9411-02-20 – Dynamic Probe Logs, Infiltration Test Results, Trial Pit Logs and Window Samples).

8.3 Receiving Environment

8.3.1 Soils

Ground conditions at the site, as observed during Preliminary Ground Investigations, are summarised as follows:

- 0.2m to 0.4m thick topsoil layer overlying;
- 0.3m to 0.75m stratum of soft to firm, slightly sandy, slightly gravelly CLAY with occasional subangular to subrounded cobbles overlying;
- Firm to very stiff, slightly sandy, slightly gravelly CLAY with occasional subangular to subrounded cobbles (to target trial pit depth of 3.0m);
- Made ground (comprising of slightly sandy gravelly Clay with plastic, brick and concrete fragments) was encountered at two trial pit locations (TP 03 and TP 009 adjacent to the site' western and eastern boundary) to a depth of approx. 1.1m. Sublayers consistent with the rest of the site was observed below made ground at these locations (as described above);
- A thin layer of Tarmacadam above made ground was also observed at Trial Pit 03 (approx. 0.1m thick). Sublayers consistent with the rest of the site was observed below this asphalt layer (as described above);
- Groundwater ingress was encountered at trial pits located in the southern portion of the site (at depths ranging from 0.9m and 2.8m below existing ground level).

Infiltration tests were carried out at two locations (sites of proposed attenuation facilities). Test results indicate that soils are impermeable with no infiltration recorded.

8.3.2 Geology

Review of information available on the Geological Survey Ireland's online mapping service ("Quaternary Sediments") indicate that the majority of the site is underlain by a subsoil layer described as "Till derived from limestones", with a small portion described as "Till derived from Metamorphic rocks". Refer to Figure 8.1 below.

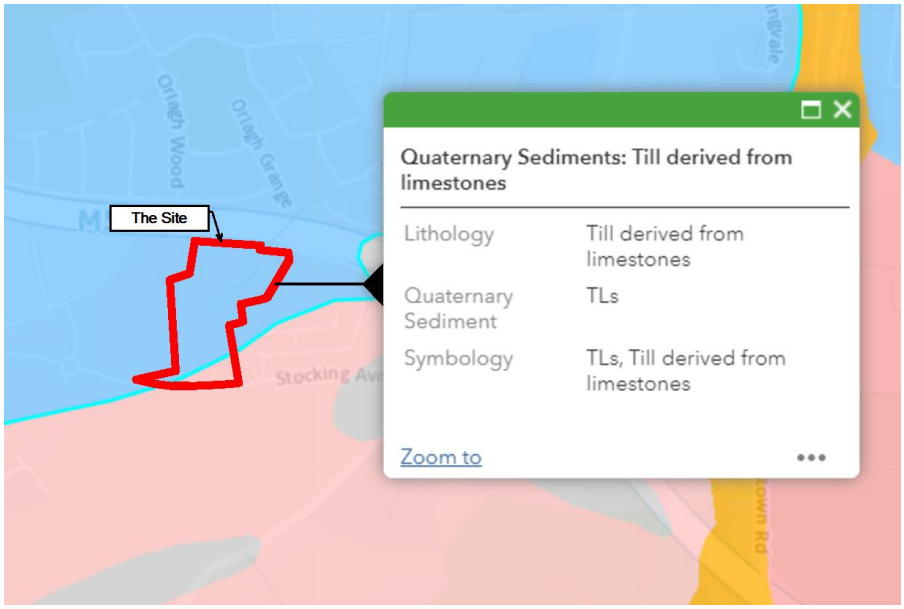


Figure 8.1: Extract from Quaternary Sediments Map (source GSI Online Mapping Service, 23/03/2020)

Review of GSI's online mapping service ("Bedrock Geology") describes geology in the vicinity of the site as "Dark Slate-Schist, Quartzite & Conticule". Refer to Figure 8.2 below.

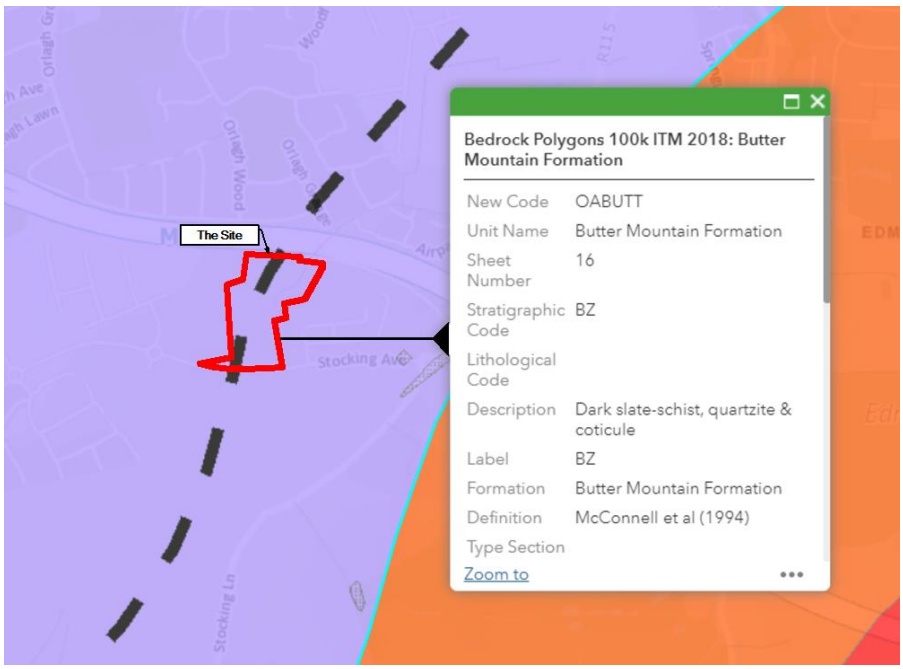


Figure 8.2: Extract from Bedrock Geology Map (source GSI Online Mapping Service, 23/03/2020)

GSI have classified the site's groundwater vulnerability as "High" for the majority of the site with "Moderate" in a small portion of the site (adjacent to the site's northern boundary). Refer to Figure 8.3 below. GSI also classified underlying bedrock aquifer as "Locally Important Aquifer – Bedrock which is Moderately productive only in local zones".

Refer to Chapter 10.0 (Water) of this EIAR for further comment regarding Hydrogeology.

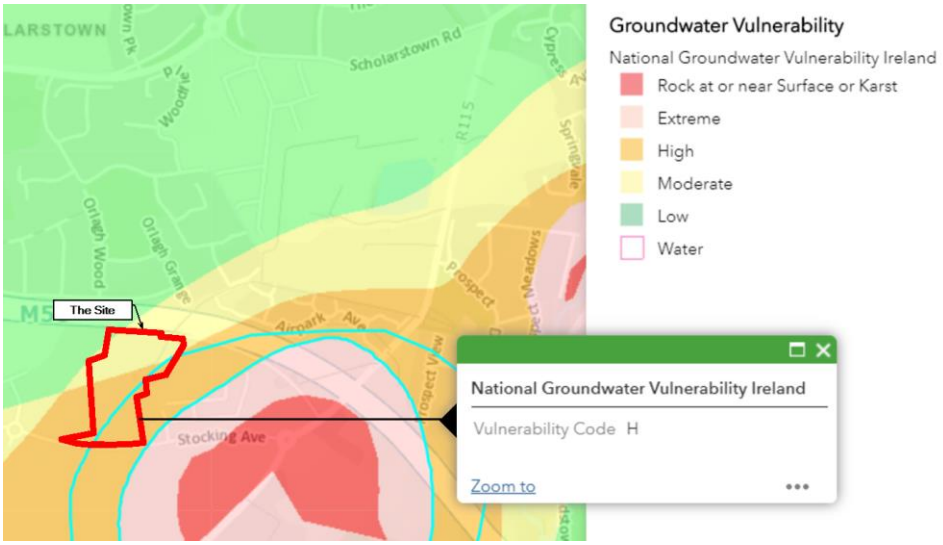


Figure 8.3: Groundwater Vulnerability Map (source GSI Online Mapping Service, 23/03/2020)

8.4 Characteristics of the Proposed Development

Site development works will include stripping of the 0.2m to 0.4m thick topsoil layer.
It is expected that all topsoil will be reused on site (incorporated into landscaping of back gardens, public open spaces and on the podium deck).

Excavation of subsoil layers will be required in order to allow road construction, foundation excavation, drainage and utility installation and provision of underground attenuation of surface water.

Underlying subsoil layers generally comprise of slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. This material is expected to be suitable for reuse as non-structural fill (e.g. build-up of back gardens areas or build-up of open spaces).

Importation of fill will be required beneath buildings, parking areas and to roadways (structural fill). Further information regarding importation of fill is included in Section 8.5.1.3 below. This material will be sourced from quarries that have all required licenses, planning permissions etc.

Due to groundwater ingress observed during trial pit investigations (refer to Section 8.3.1) there may be a need to dewater drainage excavations during construction.

In general, the designed ground floor levels and external pavement levels have been designed to follow the natural topography of the site, therefore minimising the need for cut / fill operations to enable development.

8.5 Potential Impact of the Proposed Development

8.5.1 Construction Phase

8.5.1.1 Stripping of Topsoil

Removal of the existing topsoil layer will be required. As noted previously, it is expected that all stripped topsoil will be reused on site (incorporated into landscaping of back gardens, public open spaces and on the podium deck).

Stripping of topsoil will result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion and generation of sediment laden runoff.

	Volume (m^3)
Topsoil strip (200mm to 400mm)	10,000
Topsoil reuse (landscape of gardens, open space, podium deck etc.)	10,000

Table 8.1: Preliminary Estimated Topsoil Volumes (+/- 10%)

8.5.1.2 Excavation of Subsoil Layers

Excavation of existing subsoil layers will be required in order to allow road construction, foundation excavation, drainage and utility installation and provision of underground attenuation of surface water.

Underlying subsoil materials generally comprise sandy slightly gravelly CLAY (refer to Section 8.3.1).

Due to the proposed site layout (ground floor levels and external pavement levels designed to follow the natural topography of the site), there is limited potential for reuse of excavated material as non structural fill.

As such, it is proposed to remove the majority of the excavated material from site to a licenced waste receiving facility (subject to the approval of the facility operator in accordance with their facility permit or licence).

	Volume (m^3)
Cut (excavation of subsoil layers as described in 7.5.1.2 above)	10,000
Disposal of Excavated Subsoil	7,500
Reuse of excavated material as non structural fill	2,500

Table 8.2: Excavation of Subsoil / Reuse of Excavated Material (+/- 10%)

8.5.1.3 Imported Fill

Materials imported to site for use as fill will be natural stones sourced from locally available quarries or materials that have been approved as by-products by the EPA in accordance with the EPA's criteria for determining a material is a by-product, per the provisions of article 27(1) of the European Communities (Waste Directive) Regulations, 2011.

Imported fill materials will be granular in nature and used in the construction of pavement foundations, drainage and utility bedding and surrounds and as structural fill under buildings.

Materials will be brought to site and placed in their final position in the shortest possible time. Any imported material will be kept separate from the indigenous arisings from the site. All excavation to accommodate imported material will be precisely co-ordinated to ensure no surplus material is brought to site beyond the engineering requirement.

	Volume (m^3)
Imported Granular Material (granular material beneath road pavement, under floor slabs and for drainage and utility bedding and surrounds)	10,000

Table 8.3: Imported Granular Material (+/- 10%)

8.5.1.4 Construction Traffic

Earthworks plant (e.g. dump trucks) and vehicles delivering construction materials to site (e.g. road aggregates, concrete deliveries etc.) have potential to cause rutting and deterioration of the topsoil layer and any exposed subsoil layers, resulting in erosion and generation of sediment laden runoff.

This issue can be particularly noticeable at site access points (resulting in deposition of mud and soil on the surrounding road network). Dust generation can also occur during extended dry weather periods as a result of construction traffic.

8.5.1.5 Accidental Spills and Leaks

During the construction phase there is a risk of accidental pollution from the sources noted below. Accidental spills and leaks may result in contamination of the soils underlying the site.

- Storage of oils and fuels on site
- Oils and fuels leaking from construction machinery
- Spillage during refuelling and maintenance of construction machinery
- Use of cement and concrete during construction works

8.5.1.6 Geological Environment

Due to the proposed site layout (ground floor levels and external pavement levels designed to follow the natural topography of the site), any excavations are expected to be relatively shallow and are not expected to impact on the underlying geology.

8.5.2 Operational Phase

On completion of the construction phase, there will be no further impact on soils and the geological environment.

8.5.3 'Do Nothing' Scenario

There will be no impact on soils and the geological environment if the development does not proceed.

8.6 Ameliorative, Remedial or Reductive Measures

8.6.1 Construction Phase

8.6.1.1 Stripping of Topsoil

Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.

Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.

Topsoil stockpiles will also be located so as not to necessitate double handling.

Surface water runoff from areas stripped of topsoil 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.

On-site settlement ponds are to include geotextile liners and riprapped inlets and outlets to prevent scour and erosion.

8.6.1.2 Excavation of Subsoil Layers

Design of proposed road and floor levels has minimised excavation of existing subsoil layers. Disturbed subsoil layers will be stabilised as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping).

The duration that subsoil layers are exposed is to be minimised in order to mitigate against weather effects.

Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles.

Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection and earth bunding adjacent to open drainage ditches).

8.6.1.3 Imported Fill

As noted in section 8.5.1.3 above, importation of fill to site will be required.

No large or long-term stockpiles of fill material will be held on the site. At any time, the extent of fill material held on site will be limited to that needed in the immediate vicinity of the active work area.

Smaller stockpiles of fill, where required, will be suitably protected to ensure no sediment laden runoff enters existing surface water drains. Such stockpiles are to be located in order to avoid double handling.

8.6.1.4 Construction Traffic

Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site.

Vehicle wheel wash facilities will be installed in the vicinity of any site entrances and road sweeping implemented as necessary in order to maintain the road network in the immediate vicinity of the site.

Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods.

8.6.1.5 Accidental Spills and Leaks

In order to mitigate against spillages contaminating underlying soils, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.

Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site).

8.6.1.6 Geological Environment

No mitigation measures are proposed in relation to the geological environment.

8.6.2 Operational Phase

On completion of the construction phase no further mitigation measures are proposed as there will be no further impact on soils and the geological environment.

8.6.3 'Do Nothing' Scenario

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

8.7 Predicted Impact of the Proposed Development

8.7.1 Construction Phase

Implementation of the measures outlined in Section 9.6.1 will ensure that the potential impacts of the proposed development on soils and the geological environment do not occur during the construction phase and that any residual impacts will be short term.

8.7.2 Operational Phase

There are no predicted impacts arising from the operational phase.

8.7.3 'Do Nothing' Scenario

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

8.8 Monitoring

Proposed monitoring during the construction phase in relation to the soil and geological environment are as follows:

- Adherence to Preliminary Construction Management Plan.
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road formation level in advance of placing capping material, stability of excavations etc.).
- Inspection of fuel / oil storage areas.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision vehicle wheel wash facilities.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill, protection of soils for removal from site from contamination).
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.).
- A dust management/monitoring programme should be implemented during the construction phase of the development.
- The quantities of material removed from site and their destination to be recorded (inert, contaminated non-hazardous and hazardous).
- Source of imported aggregates to be approved by the engineer prior to delivery to site

No ongoing monitoring is proposed on completion of the construction phase.

8.9 Reinstatement

All temporary construction compounds and site entrances are to be removed upon completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer's drawings.

All construction waste and / or scrapped building materials are to be removed from site on completion of the construction phase.

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.

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.

8.10 Interactions and Potential Cumulative Impacts

8.10.1 Interactions

8.10.1.1 Traffic and Transportation

Delivery of materials to site (e.g. aggregates for road construction, concrete for foundations, delivery of construction plant to site) will lead to potential impact on the surrounding road network.

8.10.1.2 Water and Hydrology

Stripping of topsoil will result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result subsoil erosion and generation of sediment laden surface water runoff.

8.10.1.3 Waste Management

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.

8.10.1.4 Noise and Vibration

Development of the site will result in a level of construction related noise and vibration.

8.10.1.5 Air Quality

Dust generation can also occur during extended dry weather periods as a result of construction traffic.

8.10.1.6 Flora and Fauna

Removal of the existing topsoil layer will be required across the site as well as removal of some trees, vegetation etc.

8.10.2 Potential Cumulative Impacts

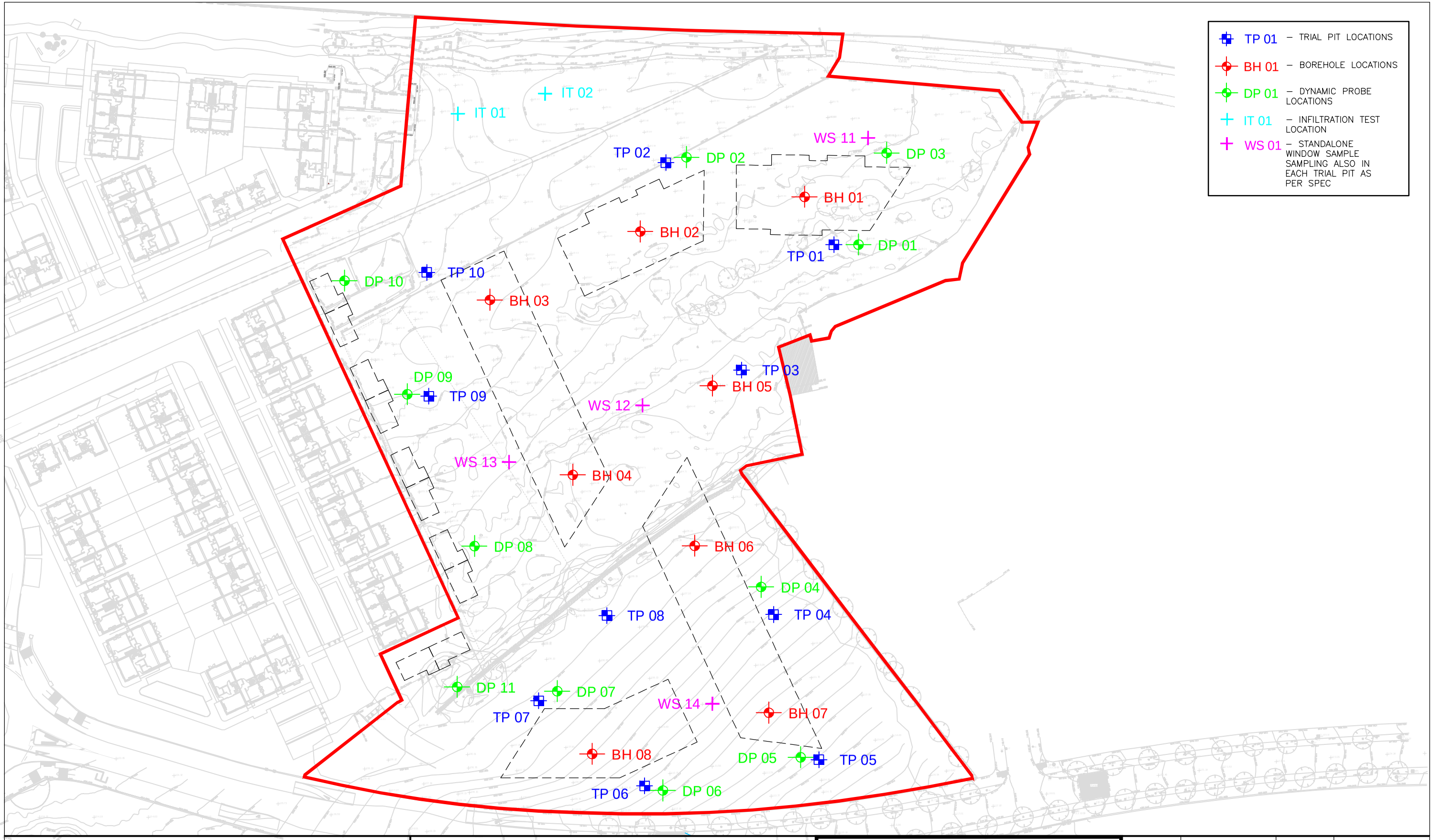
Other developments currently under construction and other committed development in the vicinity of the site have been considered and are likely to have similar impacts during the construction phase in relation to soils and geology.

Should the construction phase of any developments coincide with development of the site, potential cumulative impacts are not anticipated once similar ameliorative, remedial and reductive measures are implemented.

The applicant is also preparing a planning application for lands to the south of the subject application (known as "Stocking Central"). This planning application is not at as an advanced stage as the subject application and as such is not considered "committed" or "under construction", however, potential cumulative impacts may occur should the construction of both developments coincide.

With regard to Lands and Soils, potential cumulative impacts could occur such as excavation of subsoils, disposal of excavated material off site, dust generation and construction traffic. As noted in the paragraph above, potential cumulative impacts are not anticipated once similar ameliorative, remedial and reductive measures are implemented and co-ordinated between the subject application site and "Stocking Central" should their construction periods overlap.

APPENDIX 8-A
PRELIMINARY GROUND INVESTIGATION INFORMATION



PROJECT

WHITE PINES EAST
RATHFARNHAM, DUBLIN 14

DRG. TITLE

SITE INVESTIGATION WORKS

NOTES

DUBLIN OFFICE Ormond House, Upper Ormond Quay, Dublin 7, Ireland.
PHONE +353 1 400 4000
FAX +353 1 400 4050

WATERFORD OFFICE Unit 2, The Chandlery, 1-2 O' Connell Street, Waterford, Ireland.
PHONE +353 51 309 500
FAX +353 51 844 913

DBFL Consulting Engineers
EMAIL info@dbfl.ie SITE www.dbfl.ie

DESIGNED	JDH	PREPARED	JDF
DATE	Jan 20	CHECKED	JDH

ARCHITECT

ARDSTONE HOMES

SCALE 1:1000 @ A3	DRG. NO. 190230-7000
FILE REF. 190230-7000	

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Trial Pit Number** IT01
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 2.10m X 0.40m X 1.50m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 04/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(1.20)	MADE GROUND: Brown mottled grey slightly sandy gravelly Clay with some cobbles and plastic, brick, timber and concrete blocks		
					1.20			
					(0.30)	Possible MADE GROUND: Soft to firm brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
					1.50	Complete at 1.50m		

Plan

Remarks

No groundwater encountered
Trial pit unstable; side walls spalling
Soakaway test carried out in trial pit
Trial pit backfilled on completion of test

Scale (approx)	Logged By	Figure No.
1:25	JC	9411-02-20.IT01

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Trial Pit Number** IT02
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 2.30m X 0.40m X 1.50m	**Ground Level (mOD)**	**Client**
			Job Number 9411-02-20
	Location	**Dates** 04/03/2020	**Engineer** DBFL
			Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			fast ingress(1) at 0.80m.		(1.00)	MADE GROUND: Brown mottled grey slightly sandy gravelly Clay with some cobbles and plastic, brick, timber, tiles and concrete blocks		▽1
					1.00	Complete at 1.00m		

Plan

Remarks

Groundwater encountered at 0.80m BGL; fast ingress
Trial pit unstable; side walls spalling
Trial pit backfilled on completion of test

Scale (approx)	Logged By	Figure No.
1:25	JC	9411-02-20.IT02

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Trial Pit Number** IT02A
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 2.30m X 0.40m X 0.80m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 04/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.80)	MADE GROUND: Brown mottled grey slightly sandy gravelly Clay with some cobbles and plastic, brick, timber, tiles and concrete blocks		
			fast ingress(1) at 0.80m.		0.80	Complete at 0.80m		▽1

Plan

Remarks

Groundwater encountered at 0.80m BGL; fast ingress
Trial pit unstable; side walls spalling
Trial pit backfilled on completion of test

Scale (approx)	Logged By	Figure No.
1:25	JC	9411-02-20.IT02A

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Trial Pit Number** IT02B
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 2.30m X 0.40m X 0.70m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 04/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.70)	MADE GROUND: Brown mottled grey slightly sandy gravelly Clay with some cobbles and plastic, brick, timber, tiles and concrete blocks		
					0.70	Complete at 0.70m		

Plan

Remarks

No groundwater encountered
Trial pit unstable; side walls spalling
Trial pit backfilled on completion of test

Scale (approx)	Logged By	Figure No.
1:25	JC	9411-02-20.IT02B

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

White Pines East – Soakaway Testing Photographs

IT01



IT01



IT01



IT01



IT02



IT02



IT02



IT02



IT02A



IT02A



IT02A



IT02A



IT02B



IT02B



IT02B



IT02B



GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Catherinestown House,
Hazelhatch Road,
Newcastle,
Co. Dublin.
D22 YD52

Tel: 01 601 5175 / 5176
Email: info@gii.ie
Web: www.gii.ie

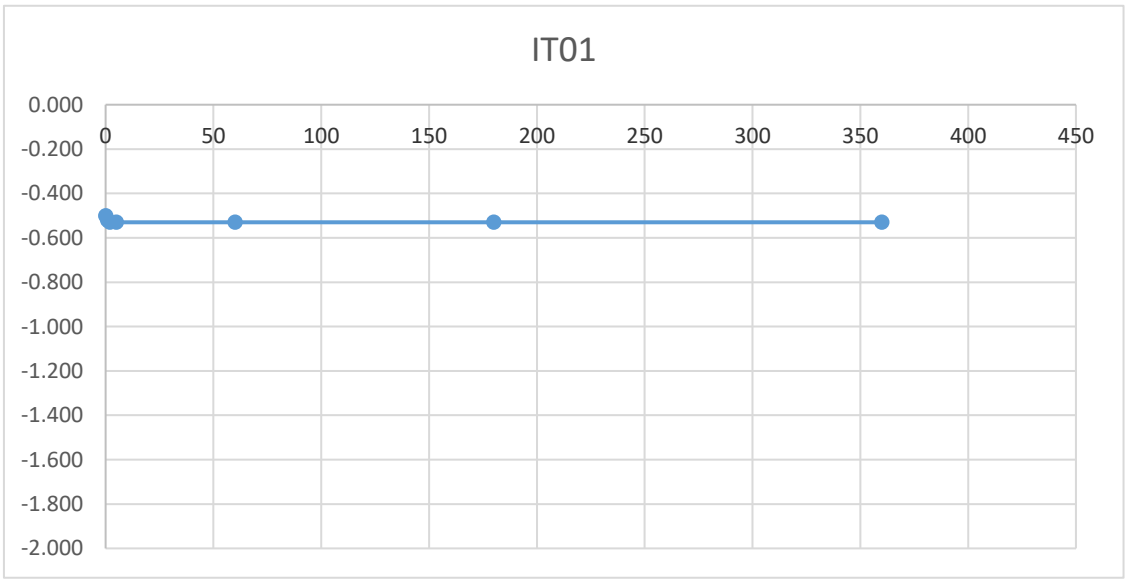
IT01

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.10m x 0.40m 1.50m (L x W x D)

Date	Time	Water level (m bgl)
04/03/2020	0	-0.500
04/03/2020	1	-0.520
04/03/2020	2	-0.530
04/03/2020	5	-0.530
04/03/2020	60	-0.530
04/03/2020	180	-0.530
04/03/2020	360	-0.530

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.50	1.500	1.000	0.75	1.25



GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Catherinestown House,
Hazelhatch Road,
Newcastle,
Co. Dublin.
D22 YD52

Tel: 01 601 5175 / 5176
Email: info@gii.ie
Web: www.gii.ie

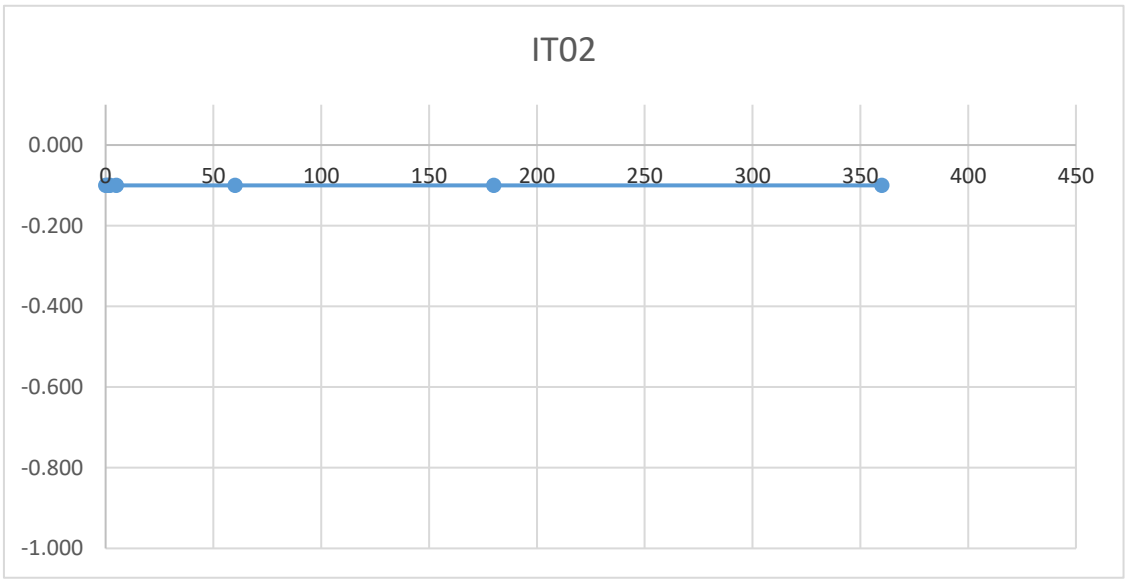
IT02

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.10m x 0.40m 0.70m (L x W x D)

Date	Time	Water level (m bgl)
04/03/2020	0	-0.100
04/03/2020	1	-0.100
04/03/2020	2	-0.100
04/03/2020	5	-0.100
04/03/2020	60	-0.100
04/03/2020	180	-0.100
04/03/2020	360	-0.100

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.10	0.700	0.600	0.25	0.55



Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Trial Pit Number** TP01
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 3.40m X 0.40m X 2.60m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 04/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL		
					(0.40) 0.60	Soft brown slighlty sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
0.75	ES		medium ingress(1) at 0.90m.		(0.50) 1.10	Firm brown slighlty sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		▽1
1.00	B				(0.70) 1.80	Firm brown mottled grey slightly sandy gravelly CLAY with some subangular to subrounded cobbles		
1.75	ES				(0.40) 2.20	Firm brown slightly sandy gravelly CLAY with some subangular to subrounded cobbles and occasional boulders		
2.00	B				(0.20) 2.40	Stiff brown slightly sandy gravelly CLAY with some subangular to subrounded cobbles and occasional boulders		
					(0.20) 2.60	Very stiff dark grey slightly sandy gravelly CLAY with some subangular to subrounded cobbles and occasional boulders		
						Complete at 2.60m		

Plan

Remarks

Groundwater encountered at 0.90m BGL; medium ingress
Trial pit unstable; side walls collapsed
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	JC	9411-02-20.TP01

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Trial Pit Number** TP02
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 3.10m X 0.40m X 3.00m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 04/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20) 0.20	MADE GROUND: Brown slightly sandy slightly gravelly Clay with grass rootlets and scrap metal		
					(0.50) 0.70	Soft brown slighlty sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
0.75	ES				(0.60) 1.30	Firm brown mottled grey slightly sandy slightly gravelly CLAY with some subangular to subrounded cobbles		
1.00	B				(0.30) 1.60	Firm brown slightly sandy gravelly CLAY with some subangular to subrounded cobbles and occasional boulders		
1.75	ES				(0.90) 2.50	Stiff brown slightly sandy gravelly CLAY with some subangular to subrounded cobbles and occasional boulders		
2.00	B				(0.50) 3.00	Very stiff dark grey slightly sandy gravelly CLAY with some subangular to subrounded cobbles and occasional boulders		
3.00	B					Complete at 3.00m		

Plan

Remarks

No groundwater encountered
Trial pit unstable; side walls collapsed
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	JC	9411-02-20.TP02

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Trial Pit Number** TP03
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 3.40m X 0.40m X 2.50m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 04/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.10) 0.10	MADE GROUND: Tarmacadam		
						MADE GROUND: Dark brown/brown slightly sandy gravelly Clay with some cobbles and glass, plastic, PVC, tarmacadam, and concrete pieces		
					(1.00)			
0.75	ES							
1.00	B				1.10	Possible MADE GROUND: Soft brown slightly sandy slightly gravelly Clay with some subangular to subrounded cobbles, orgranic pockets and flat granite boulders		
			medium ingress(1) at 1.50m.		(0.90)			▽1
1.75	ES							
2.00	B		fast ingress(2) at 2.00m.		2.00	Firm brown slightly sandy gravelly CLAY with some subangular to subrounded cobbles and occasional boulders		▽2
					(0.50)			
					2.50	Complete at 2.50m		

Plan

Remarks

Groundwater encountered at 1.50m BGL; medium ingress
Second groundwater strike at 2.00m BGL; fast ingress
Trial pit unstable; side walls collapsed
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	JC	9411-02-20.TP03

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Trial Pit Number** TP04
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 2.90m X 0.40m X 3.00m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 05/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	Brown slightly sandy slightly gravelly TOPSOIL with roots		
					0.40			
					(0.30)	Soft brown slighlty sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
					0.70			
0.75	ES				(0.40)	Firm to stiff brown slighlty sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
1.00	B				1.10			
					(0.30)	Stiff brown slightly sandy very gravelly CLAY with occasional angular cobbles. Gravel is angular fine to coarse of schist		
					1.40			
					(0.30)	Medium dense brown/grey silty sandy angular fine to coarse GRAVEL with occasional angular cobbles of schist. (presumed residual Schist)		
			fast ingress(1) at 1.70m.		1.70			▽1
1.75	ES				(0.30)	Dense brown/grey silty sandy angular fine to coarse GRAVEL with occasional angular cobbles of schist. (presumed residual Schist)		
2.00	B				2.00			
					(1.00)	Dense brown/grey silty sandy angular fine to coarse GRAVEL with some angular cobbles of schist. (presumed residual Schist)		
3.00	B				3.00	Complete at 3.00m		

Plan

Remarks

Groundwater encountered at 1.70m BGL; fast ingress
Trial pit unstable; side walls spalling
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	JC	9411-02-20.TP04

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Trial Pit Number** TP05
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 2.90m X 0.40m X 3.00m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 05/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	Brown slightly sandy slightly gravelly TOPSOIL with roots		
					0.40			
					(0.35)	Soft to firm brown slighlty sandy slightly gravelly CLAY		
0.75	ES				0.75			
1.00	B				(0.45)	Soft brown slightly sandy very gravelly CLAY with occasional angular cobbles. Gravel is angular fine to coarse of schist		
					1.20			
					(0.30)	Medium dense brown/grey silty sandy angular fine to coarse GRAVEL with occasional angular cobbles of schist. (presumed residual Schist)		
					1.50			
1.75	ES					Dense brown/grey silty sandy angular fine to coarse GRAVEL with occasional angular cobbles of schist. (presumed residual Schist)		
2.00	B				(1.10)			
					2.60			
					(0.40)	Dense brown/grey silty sandy angular fine to coarse GRAVEL with some angular cobbles of schist. (presumed residual Schist)		
3.00	B				3.00			
						Complete at 3.00m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	JC	9411-02-20.TP05

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Trial Pit Number** TP06
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 2.90m X 0.40m X 3.00m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 05/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	MADE GROUND: Brown slightly sandy gravelly Clay with some cobbles and fragments of plastic		
					0.40			
0.75	ES				(0.50)	Firm brown slightly sandy gravelly CLAY with some angular cobbles of schist. Gravel is angular fine to coarse of schist		
					0.90			
1.00	B				(0.20)	Stiff brown slightly sandy gravelly CLAY with some angular cobbles of schist. Gravel is angular fine to coarse of schist		
					1.10			
					(1.10)	Medium dense brown/grey silty sandy angular fine to coarse GRAVEL with occasional angular cobbles of schist. (presumed residual Schist)		
1.75	ES							
2.00	B							
					2.20			
			seepage(1) at 2.80m.		(0.80)	Dense brown/grey silty sandy angular fine to coarse GRAVEL with occasional angular cobbles of schist. (presumed residual Schist)		▽1
					3.00			
3.00	B					Complete at 3.00m		

Plan

Remarks

Groundwater seepage at 2.80m BGL
Trial pit unstable; side walls slightly spalling
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	JC	9411-02-20.TP06

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Trial Pit Number** TP07
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 3.40m X 0.40m X 2.70m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 05/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL		
					0.30			
					(0.30)	Soft brown slighlty sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
					0.60			
0.75	ES					Firm brown slightly sandy very gravelly CLAY with occasional angular cobbles. Gravel is angular fine to coarse of schist		
					(0.70)			
1.00	B							
					1.30			
						Medium dense brown/grey silty sandy angular fine to coarse GRAVEL with occasional angular cobbles of schist. (presumed residual Schist)		
					(0.60)			
1.75	ES							
					1.90			
2.00	B					Dense brown/grey silty sandy angular fine to coarse GRAVEL with occasional angular cobbles of schist. (presumed residual Schist)		
					(0.40)			
					2.30			
2.50	B					Obstruction: presumed bedrock		
						Complete at 2.70m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	JC	9411-02-20.TP07

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Trial Pit Number** TP08
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 2.90m X 0.40m X 2.30m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 05/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with roots		
					0.30			
					(0.45)	Soft to firm brown slighlty sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
0.75	ES				0.75			
1.00	B				(0.45)	Firm brown/grey slightly sandy very gravelly CLAY with occasional angular cobbles. Gravel is angular fine to coarse of schist		
					1.20			
1.75	ES		seepage(1) at 1.80m.		(1.10)	Brown/grey silty sandy angular fine to coarse GRAVEL with some angular cobbles of schist. (presumed residual Schist)		▽1
2.00	B					Obstruction: presumed bedrock		
					2.30	Complete at 2.30m		

Plan

Remarks

Groundwater seepage at 1.80m BGL
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	JC	9411-02-20.TP08

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Trial Pit Number** TP09
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 2.70m X 0.40m X 3.00m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 04/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20) 0.20	MADE GROUND: Brown slightly sandy very gravelly Clay with grass rootlets		
						MADE GROUND: Brown slightly sandy gravelly Clay with some cobbles and brick, PVC and concrete		
0.75	ES				(0.90)			
1.00	B				1.10			
					(0.20) 1.30	Soft brown mottled grey slightly sandy slightly gravelly CLAY with some subangular to subrounded cobbles and occasional boulders		
			seepage(1) at 1.40m.			Soft to firm brown mottled grey slightly sandy slightly gravelly CLAY with some subangular to subrounded cobbles and occasional boulders		▽1
1.75	ES				(0.90)			
2.00	B				2.20			
						Firm to stiff dark grey slightly sandy gravelly CLAY with some subangular to subrounded cobbles and occasional boulders		
					(0.70)			
					2.90 (0.10) 3.00	Stiff dark grey slightly sandy gravelly CLAY with some subangular to subrounded cobbles and occasional boulders		
3.00	B					Complete at 3.00m		

Plan

Remarks

Groundwater seepage at 1.40m BGL
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	JC	9411-02-20.TP09

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Trial Pit Number** TP10
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 2.70m X 0.40m X 3.00m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 04/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.60)	MADE GROUND: Brown mottled grey slightly sandy gravelly Clay with some cobbles and plastic		
					0.60			
0.75	ES				(0.50)	Soft to firm brown mottled grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles		
1.00	B				1.10			
					(1.00)	Firm brown slightly sandy gravelly CLAY with some subangular to subrounded cobbles		
1.75	ES							
2.00	B				2.10			
					(0.90)	Stiff dark grey slightly sandy gravelly CLAY with some subangular to subrounded cobbles and occasional boulders		
3.00	B				3.00	Complete at 3.00m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	JC	9411-02-20.TP10

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

White Pines East – Trial Pit Photographs

TP01



TP01



TP01



TP01



TP02



TP02



TP02



TP02



TP03



TP03



TP03



TP03



TP04



TP04



TP04



TP04



TP05



TP05



TP05



TP05



TP06



TP06



TP06



TP06



TP07



TP07



TP07



TP07



TP08



TP08



TP08



TP08



TP09



TP09



TP09



TP09



TP10



TP10



TP10



TP10



Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Number** WS11
Machine : TECOPSA **Method :** Drive-in Windowless Sampler	**Dimensions** 88mm to 2.00m 68mm to 2.70m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 06/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.15)	Brown slightly sandy slightly gravelly TOPOSIL with grass rootlets		
0.15-1.00	B				0.15	Soft brown slightly sandy slightly gravelly CLAY		
					(0.35)			
					0.50	Firm brown slightly sandy slightly gravelly CLAY with some subangular to subrounded cobbles		
0.75	ES							
1.00-2.00	B				(1.50)			
1.75	ES							
2.00-2.70	B				2.00	Stiff brownish grey slightly sandy gravelly CLAY		
					(0.70)			
					2.70	Complete at 2.70m		

Remarks
0.00m to 1.00m BGL - 100% Recovery
1.00m to 2.00m BGL - 100% Recovery
2.00m to 2.70m BGL - 100% Recovery
Refusal at 2.70m BGL

Scale (approx)	Logged By
1:25	JC

Figure No. 9411-02-20.WS11

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Number** WS12
Machine : TECOPSA **Method :** Drive-in Windowless Sampler	**Dimensions** 88mm to 2.00m 68mm to 2.90m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 06/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.10) 0.10	MADE GROUND: Tarmacadam		
0.10-1.00	B				(0.30) 0.40	MADE GROUND: Brown/grey clayey sandy angular to subrounded fine to coarse GRAVEL with occasional subangular cobbles		
0.75	ES				(1.05) 1.45	MADE GROUND: Brown/grey slightly sandy slightly gravelly Clay with some subangular cobbles of granite, fragments of brick, shells and timber, and organic pockets		
1.00-1.75	B				(0.30) 1.75	Soft brown slightly sandy slightly gravelly CLAY with occasional subangular cobbles		
1.75	ES				(0.25) 2.00	No recovery		
2.00-2.50	B				(0.50) 2.50	Soft greyish brown slightly sandy gravelly CLAY (wet)		
					(0.40) 2.90	No recovery		
						Complete at 2.90m		

Remarks
0.00m to 1.00m BGL - 100% Recovery
1.00m to 2.00m BGL - 75% Recovery
2.00m to 2.90m BGL - 55% Recovery
Refusal at 2.90m BGL

Scale (approx)	**Logged By**
1:25	JC

Figure No. 9411-02-20.WS12

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Number** WS13
Machine : TECOPSA **Method :** Drive-in Windowless Sampler	**Dimensions** 88mm to 3.00m	**Ground Level (mOD)**	**Client**
	Location	**Dates** 06/03/2020	**Engineer** DBFL
Job Number 9411-02-20			**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.50	B					MADE GROUND: Brown/grey slightly sandy gravelly Clay with some cobbles, fragments of brick and concrete		
0.75	ES				(1.50)			
1.50-2.40	B				1.50	Possible MADE GROUND: Soft brownish grey slightly sandy slightly gravelly CLAY		
					(0.30)			
1.75	ES				1.80	No recovery		
					(0.20)			
					2.00	Possible MADE GROUND: Soft brownish grey slightly sandy slightly gravelly CLAY with organic pockets, shell fragments and plant remains		
					(0.40)			
2.40-3.00	B				2.40	Possible MADE GROUND: Firm to stiff dark grey slightly sandy gravelly CLAY		
					(0.35)			
					2.75	Possible MADE GROUND: Soft brownish grey/dark grey slightly sandy slightly gravelly CLAY with organic pockets, shell fragments and plant remains		
					(0.25)			
					3.00	Complete at 3.00m		

Remarks
0.00m to 1.00m BGL - 90% Recovery
1.00m to 2.00m BGL - 80% Recovery
2.00m to 3.00m BGL - 100% Recovery
Refusal at 3.00m BGL

Scale (approx)	Logged By
1:25	JC

Figure No. 9411-02-20.WS13

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

Ground Investigations Ireland Ltd
www.gii.ie

Site White Pines East			**Number** WS14
Machine : TECOPSA **Method :** Drive-in Windowless Sampler	**Dimensions** 88mm to 1.80m	**Ground Level (mOD)**	**Client**	**Job Number** 9411-02-20
	Location	**Dates** 10/03/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.80	B				(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL		
					(0.60)	Soft to firm brown slightly sandy gravelly CLAY with occasional subangular cobbles of schist. Gravel is angular to subangular fine to coarse of schist		
0.75 0.80-1.80	ES B				0.80 (0.30)	Brown/grey clayey silty sandy angular fine to coarse GRAVEL with occasional angular cobbles of schist. (presumed residual Schist)		
					1.10 (0.70)	Brown/grey silty sandy angular fine to coarse GRAVEL with occasional angular cobbles of schist. (presumed residual Schist)		
1.75	ES				1.80	Complete at 1.80m		

Remarks
0.00m to 1.00m BGL - 100% Recovery
1.00m to 1.80m BGL - 100% Recovery
Refusal at 1.80m BGL

Scale (approx)	Logged By
1:25	JC

Figure No. 9411-02-20.WS14

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

White Pines East – Window Sample Photographs

WS11



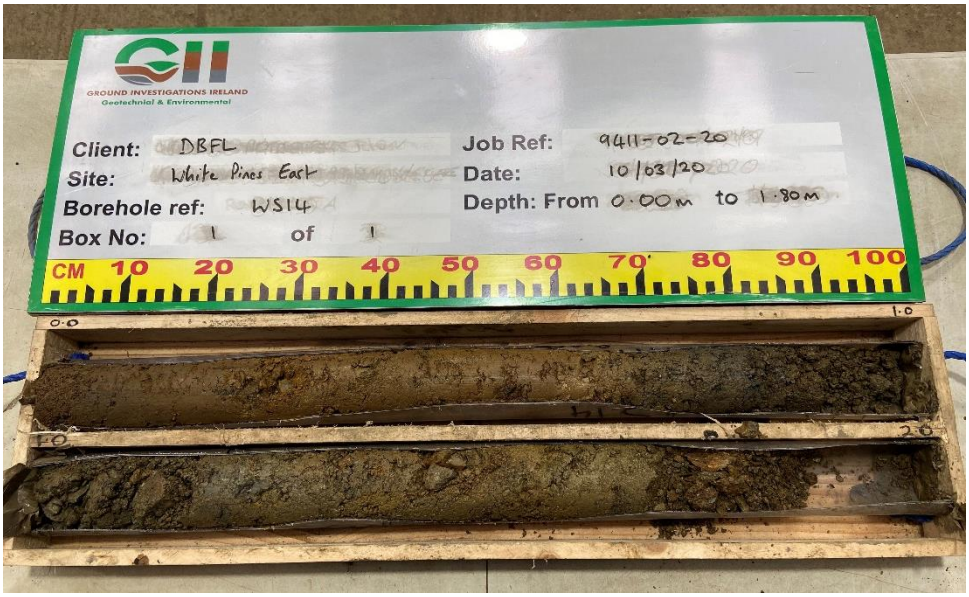
WS12



WS13


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: DBFL
Site: White Pines East
Borehole ref: WS13
Box No: 1 of 1
Job Ref: 9411-02-20
Date: 06/03/2020
Depth: From 0.00m to 3.00m
CM 10 20 30 40 50 60 70 80 90 100

WS14


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: DBFL
Site: White Pines East
Borehole ref: WS14
Box No: 1 of 1
Job Ref: 9411-02-20
Date: 10/03/20
Depth: From 0.00m to 1.80m
CM 10 20 30 40 50 60 70 80 90 100

9.0 LANDSCAPE & VISUAL IMPACT ASSESSMENT

9.1 Introduction

Mitchell + Associates was engaged by Ardstone Homes to prepare a Landscape and Visual Impact Assessment (LVIA) as part of the Environmental Impact Assessment Report (EIAR) for this proposed residential development at White Pines East, Stocking Avenue, Woodstown, Dublin 16. This Chapter of the LVIA assesses the impact of the proposed development on the landscape character and visual amenity of the current site and on the contiguous area and the site environs. It considers these in the context of the site, in the south-western suburbs of Dublin. It describes the landscape character of the subject site and its hinterland, together with the visibility of the site from significant viewpoints in the locality. It includes an outline of the methodology utilised to assess the impacts and descriptions of the receiving environment (baseline) and of the potential impacts of the development. Mitigation measures introduced to ameliorate or offset impacts are considered and the resultant predicted (residual) impacts outlined.

This chapter should be read with reference to the Architectural Design Statement prepared by John Fleming Architects and with the photomontages, which are contained in a separate A3 report prepared by 3D Design Bureau.



Figure 9.1: Site location and context (Source: Bing Maps, annotated by Mitchell + Associates)

The site for the proposed development covers an area of 2.98 Ha to the east of the existing White Pines developments to either side of Stocking Avenue in Rathfarnham, Dublin 16. In this area, five sites in total are in the ownership of the applicant, Ardstone Homes. Figure 9.2 (below) outlines the subject site in red and the other four sites in blue. Of the four neighbouring sites; two are complete (White Pines North and White Pines South), White Pines Retail is currently under construction (scheduled for completion Q3 2021) and White Pines Central is in design development with a planning application to be lodged in due course.



Figure 9.2: Ardstone Homes Development Sites (Source: JFA Design Statement).

9.2 Study Methodology

9.2.1 Introduction

This assessment was carried out between March 2020 and February 2021. Landscape and Visual Impact Assessment (LVIA) includes consideration of two main aspects:

- Landscape Character Impact – the assessment of effects on the character of the landscape arising from the insertion of the proposed development into the existing landscape context. The 'landscape' aspect of assessment is relatively subjective and can be described broadly as the human, social and cultural experience of one's surroundings. These combined impacts will elicit responses whose significance will be partially dependent on how people perceive a particular landscape and how much the changes will matter in relation to other senses as experienced and valued by those concerned. Despite the extremely large part played by our visual experience in forming our views on landscape, one's perception and indeed memory also play an important part if the changes brought about in landscape character are to be fully understood. It is clear therefore that different people doing different things will experience the surrounding landscape in different ways. Such sensitivities and variations in response, including where and when they are likely to occur, are taken into consideration in the assessment.
- Visual Impact – the assessment of effects of the proposed development on the visual environment and visual amenity as evidenced by the comparison of baseline (existing) images and photomontages illustrating the proposed development in context. This second aspect is somewhat less subjective in that direct 'before and after' comparisons can be made. Visual impact occurs by means of visual intrusion and/or

visual obstruction and the distance between subject and viewpoint has a bearing on the scale of such impact.

It is appropriate that aspects of architectural context and design approach are addressed when assessing impact of proposed building development on the landscape. In this regard, aspects of the architectural design rationale and the specific architectural responses to the site and context, are referred to within this report.

The standard evaluation methodology used in the preparation of the Landscape and Visual Impact Assessment (LVIA) for Environmental Impact Assessment Reports (EIAR) is used. The evaluation methodology is therefore based on the following:

- 'Guidelines on the information to be contained in Environmental Impact Statements' - Environmental Protection Agency (EPA) 2002.
- 'Advice Notes on Current Practice in the preparation of Environmental Impact Statements' - Environmental Protection Agency (EPA), September 2003.
- 'Guidelines for Landscape and Visual Impact Assessment', prepared by the Landscape Institute and the Institute of Environmental Assessment, published by Routledge, 3rd Edition 2013.
- Reference is also made to the DRAFT 'Revised guidelines on the information to be contained in Environmental Impact Statements' - Environmental Protection Agency (EPA), September 2015 and;
- The DRAFT 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' - Environmental Protection Agency (EPA), August 2017.

This Landscape and Visual Impact Assessment involved:

- Visiting the area in March and July 2020 and preparing a photographic record of the main landscape features;
- Undertaking a desk study of the subject site and its immediate environs in relation to its local and broader significance using the information gathered from site visits, studying aerial photography, historic and Ordnance Survey mapping;
- Establishing and describing the receiving environment in terms of the existing landscape, its visual amenity and its significance;
- Assessing the nature, scale and quality of the proposed development through examination of the design team's outline drawings, illustrations and descriptions of the proposed scheme;
- Assessing potential viewpoints, choosing and agreeing those which could be considered most important and most representative in terms of visual impact; and
- Assessing the landscape and visual impacts of the proposed development through consideration and interpretation of the prepared photomontages.

9.2.2 Photomontage Methodology

The primary method adopted for Visual Impact Assessment relies largely on a comparative visual technique whereby accurate photomontages incorporating the proposed development are compared to the existing corresponding baseline photograph so that an assessment of impact can be made. These 'before' and 'after' images are prepared for a number of selected viewpoints. The methodology adopted for the preparation of photomontages, including; site

photography; 3D computer modelling and; rendering of views, is outlined in the A3 photomontage document prepared by 3D Design Bureau, accompanying this submission.

9.2.3 Selection of views

In recognition of the sensitivities of this location and to enable a full and detailed assessment of the proposal, a total of 17 views were selected for which photomontages have been prepared.



Figure 9.3: Selected viewpoints (near)



Figure 9.4: Selected viewpoints (distant)

The views were chosen to represent the greatest likely visual impact from a variety of directions around the site, allowing sufficient distance to see the proposed development within its landscape context. In accordance with the guidelines, views from the public domain were given priority, particularly those from main thoroughfares and public places. These 17 views are 'verified views', whereby accepted protocols are followed in their preparation to ensure a high level of accuracy. In addition, two views have been prepared from locations on the M50 motorway which, in being incapable of survey, are not verifiable. Whilst these two additional images cannot be considered accurate enough for inclusion in the assessment of impacts, they are nevertheless considered to be as accurate as circumstances permit. Having been specifically requested by South Dublin County Council, they are therefore included within Appendix A of this report with an outline commentary, for information only at this stage.

The Guidelines also require that the proposed development is considered in context and that photomontages illustrate the proposed development with sufficient context for proper assessment. The views submitted are considered to be the most important and representative, having regard to the requirement to examine the likely significant impacts.

The initial photomontages prepared are also used to assess the design and to inform the design team of any advisable amendments – this is an iterative process and offers an opportunity for the design team to adjust the design or for the location of viewpoints to be adjusted to be sure of illustrating maximum impact. Location maps of the selected viewpoints are also included with the photomontages in the separate A3 document prepared by 3D Design Bureau.

9.2.4 Methodology for the Rating of Impacts

An assessment is made in respect of the significance, scale or magnitude of predicted impacts which is set against an assessment of the quality/sensitivity of the impact. For each view, the scale/magnitude of impact is related to the simple quantum of change within the field of view and to the nature and sensitivity of such change in respect of the respective receptors, in the context of the existing (receiving) environment. Therefore, whilst the significance or scale of impact may range from 'imperceptible' to 'profound' and these may in part be related to distance and proximity, it should be remembered that the nature of the change and the sensitivities of the viewers also play a part in this aspect of assessment for each view.

The quality of impact can be assessed as 'positive' or 'negative' depending on whether the change is considered to improve or reduce the quality of the landscape character or visual environment. The quality of impact may also be assessed as 'neutral' if the quality of the environment is unaffected. The assessment of quality in particular, needs to consider and weigh-up a range of issues and potentially conflicting standpoints. The nature of the proposed change, its context, appropriateness, quality of design and the sensitivities of the viewers are all important considerations for this aspect of assessment.

This latter issue of sensitivity can create emotive responses which often have little or no regard for the appropriateness and/or design of the proposal, however the assessment also needs to be considered in the context of design quality and appropriateness. For example, in this case of a residential development proposed for existing agricultural lands on the fringes of the city, the interests or concerns (sensitivities) of say, a local farmer may differ greatly to those of an existing local resident or potential house-buyer. The reconciliation of such sensitivities could be considered unlikely, in which case, issues of appropriateness and design quality become

more influential in the assessment. The quantum, scale and proximity of proposed development are important aspects to be considered in terms of the carrying capacity of any sensitive landscape. The scheme design of the whole development (buildings, roads, planting etc) and the subtleties of detail design in such circumstances are important in mitigating potentially negative impacts and ultimately, in determining appropriateness.

The duration of impact is a third aspect of assessment to be considered and may range from temporary to permanent. In this case, the proposed housing is likely to be long term, however the effectiveness of existing and proposed planting in assimilating the scheme into the existing landscape context or in totally screening it will presumably develop and mature over time. The temporary/short term impacts during the construction of the proposed development are also considered.

9.2.5 Criteria for the Rating of Impacts

The significance criteria used for landscape and visual assessment are based on those given in the EPA 'Guidelines on the information to be contained in Environmental Impact Statements', 2002, (Section 5 Glossary of Impacts) and the DRAFT 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' - Environmental Protection Agency (EPA), August 2017 (Section 3, pp 50-52). For this LVIA they are further described as follows:

Degree or magnitude of effects (significance)

- Imperceptible / Not Significant: The development proposal is either distant or screened by existing landform, vegetation or built environment.
- Slight Effects: The development proposal forms only a small element in the overall panorama/ field of view, or there is substantial intervening screening by the existing landform, topography and/or vegetation. The view or character of the landscape is noticeably changed but without affecting its sensitivities.
- Moderate Effects: An appreciable segment of the existing view is affected by the proposed development or the development creates visual intrusion in the foreground. The view or the character of the landscape is altered but in a manner that is consistent with existing and emerging baseline trends.
- Significant Effects: Effects which, by their character, magnitude, duration or intensity alter a sensitive aspect of the landscape/ view.
- Very Significant Effects: Effects which, by their character, magnitude, duration or intensity alter most of a sensitive aspect of the landscape/view.
- Profound Effects: Effects which obliterate sensitive characteristics of the landscape and/or view.

Quality of Effects

The quality of potential visual and landscape effects is assessed, in line with EPA guidelines as follows:

- Positive Effects: Changes which improve the quality of the landscape/view.
- Neutral Effects: Changes which do not affect the quality of the landscape/view.
- Negative Effects: Changes which adversely affect the character of the landscape or reduce the quality of the visual environment.

Duration of effects

Potential effects arising from a proposed development may also be considered in terms of duration as described in the EPA Guidelines:

- Momentary/Brief: Effects lasting less than a day
- Temporary: Effects lasting less than one year
- Short-term: Effects lasting one to seven years
- Medium-term: Effects lasting seven to fifteen years
- Long-term: Effects lasting fifteen to sixty years
- Permanent: Effects lasting over sixty years

9.3 The Existing Receiving Environment (Baseline Situation)

9.3.1 Site Location and Landscape Context

The site for proposed development occupies lands along the northern edge of Stocking Avenue, and just east of the existing, recently constructed White Pines (North) residential development. The M50 motorway runs along the northern edge of the site. The site was formerly agricultural land which is now largely characterised by rank grassland with scrub vegetation and several lines of mature trees marking former hedgerows, the best of these at the eastern edges of the site. The site rises gently from the northern boundary up towards the southern end of the site where it then rises more steeply up to Stocking Avenue, along the southern site boundary. Overall, there is a difference in level between the high and low points of the site of approx. 14 metres.

The general context for this site is one of emerging residential neighbourhoods situated on the southern fringe of the city some 7.5km south-west of Dublin City Centre. The site is located on higher ground looking north over the city and the ground rises more steeply to the south, up towards the Dublin Mountains.

The lands rising to the south are distinctly rural in character, featuring open fields, sub-divided by mature tree-lined hedgerows with the occasional one-off house. By contrast, the residential developments adjoining the subject site are generally of two and three storey family homes in terraced blocks and finished in a mix of brick and render. North of the M50, residential developments, typically 2-storey are the predominant land-use.

9.3.2 Planning Context

The site for proposed development is a greenfield site, which is zoned ('Objective RES-N') in the South Dublin Development Plan 2016-2022, for new residential communities in accordance with approved area plans – coloured yellow in the Figure 9.5 extract (below). The site is also located within the area of the Ballycullen Oldcourt Local Area Plan (2014).

There are no Protected or Preserved Significant Views affected by the proposed development, the nearest being located along the upper part of Stocking Lane, looking to the west and north-west - indicated by the blue arrows in Figure 9.5 (below). There are also no Preserved Prospects likely to be significantly affected by the proposed development.

There are no recorded monuments within 0.5km of the proposed development site. There is one Protected Structure in the vicinity which could potentially be affected by the proposed development; a gate lodge (RPS No. 353) associated with Woodtown Park/Manor, which sits on higher ground approx. 250m to the south of the proposed development site – this is adjacent to the entrance to Rathfarnham Golf Club on Stocking Lane.

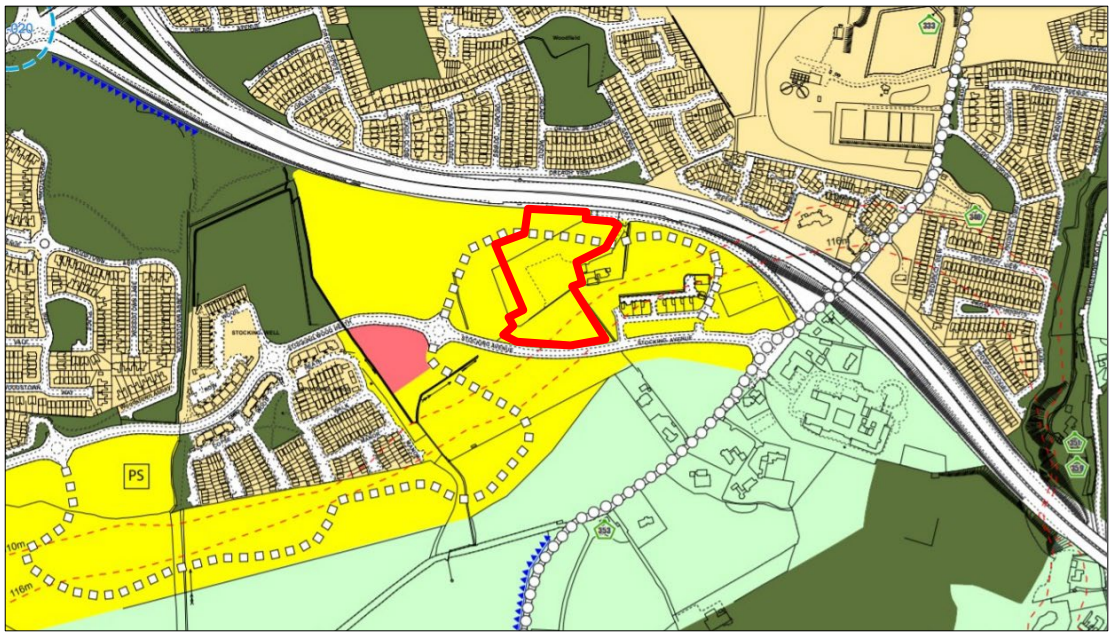


Figure 9.5: Extract from the South Dublin Development Plan 2016-2022, Application Site Outlined Red

9.4 Characteristics of the Proposed Development

9.4.1 Introduction

The development will consist of:

- The construction of 241 no. residential units, in 5 no. apartment blocks, ranging in height from 4-6 storeys, and 3no. three storey duplex block. The development will provide 93 no. 1 Bed and 148 no. 2 bed units, as follows;
  - Block A is a 5 storey block comprising 40 units (20 no. 1 bed units; and 20 no. 2 bed units). Block A includes balconies on southern, northern and western elevations. A dedicated community building space comprising 552sq.m will also be provided on the ground floor of Block A.
  - Block B is a 4 storey block comprising 34 units (18 no. 1 bed units; and 16 no. 2 bed units). Block B includes balconies on southern, southern, western and eastern elevations;
  - Block C is a Part 4 Part 5 storey block comprising 43 units (21 no. 1 bed units; 22 no. 2 bed units) Block C includes balconies on southern, eastern and western elevations. Residential Tenant Amenities comprising c.171sq.m is provided at ground floor level of Block C to serve all residential units, comprising; a reception area, games space, residents lounge and gym space.
  - Block D is a 5 storey block comprising 49 no units (17 no. 1 bed units and 32 no. 2 bed units). Block D includes balconies on southern, western and eastern elevations;

- Block E is a 6 storey block comprising 47 no units (13 no. 1 bed units and 34 no. 2 bed units). Block E includes balconies on southern, western, eastern and northern elevations;
- 3 no. 3 storey duplex blocks are provided to the western boundary of the site, comprising 28 no. 2 bed units. Balconies and terrace space is provided to the eastern elevation.

- Provision of 204 no. on street car parking spaces
- Omission of creche as approved under SDCC Ref. SD14A/0222;
- The main vehicular access to the scheme will be from Stocking Avenue. A second new vehicular access is proposed from White Pines North to the east.
- Provision of 401 no. bicycle parking spaces;
- All other ancillary site development works to facilitate construction, site services, piped infrastructure, ESB sub-stations, plant, public lighting, bin stores, bike stores, boundary treatments and provision of public and private open space including hard and soft landscaping, plant, provision of public and private open space areas comprising hard and soft landscaping, site services all other associated site excavation, infrastructural and site development works above and below ground.



Figure 9.6: Site Layout Plan (Source: JFA Design Statement)

9.4.2 Context and Design Characteristics

The design of the proposed scheme is comprehensively described and illustrated in the Architectural Design Statement prepared by John Fleming Architects, which accompanies this submission. It sets out the development of the scheme design, from broad conceptual strategy and design rationale through to scheme detail including sections and elevations. It illustrates

how the scheme is designed into the sloping site, which rises quite steeply to the south and how it relates to adjacent residential development, in terms of permeability and of building scale. The treatment of the building facades can be discerned from the elevations and computer-generated images (CGI's) provided and indicate a high level of sensitivity as to how the proposed buildings sit in their landscape context.

9.5 Potential Impact of the Proposed Development

A development such as this proposal has the potential to impact significantly upon the landscape and visual aspects of the existing environment in a number of ways, at both construction and operational stages. Effects can be short or long term; temporary or permanent. The purpose of this section of the report is to describe the potential effects of such proposed development; upon the visual and landscape aspects of the immediate area, and further afield, where relevant.

9.5.1 Construction Phase

Potential visual impacts during the construction phase are related to temporary works, site activity, and vehicular movement within and around the subject site. Vehicular movement may increase in the immediate area, and temporary vertical elements such as scaffolding, site fencing, gates, plant and machinery etc., will be required and put in place. All construction impacts will be short term, and may include the following:

- Site preparation works and operations (including tree protection measures)
- Site excavations and earthworks
- Site infrastructure and vehicular access
- Construction traffic, dust and other emissions
- Temporary fencing/hoardings
- Temporary site lighting
- Temporary site buildings (including office accommodation)
- Cranes and scaffolding

9.5.2 Operational Phase

The proposed development will consist of the insertion of new residential buildings, road infrastructure and associated ancillary elements onto the subject site and will replace the existing green fields currently covering the site. It should be noted that the location and effectiveness of some of the existing field boundary hedgerows and mature trees if retained, will assist in restricting and screening existing views into the site from without. The potential impact of the proposed development however, could be negative, particularly if some of the more valuable existing boundary vegetation is damaged or degraded. Many aspects of the proposed scheme design are included specifically to respond to such issues and any associated concerns. The design approach and specific mitigation measures employed to address such sensitive contextual issues and to respect and enhance the local rural environs are outlined in Section 9.6 'Avoidance, Remedial and Mitigation Measures', below.

9.5.3 'Do Nothing' Impact

If the proposed development were not to proceed, the site would presumably (in terms of its landscape impact), remain in its present form for a period. In such circumstances the current pattern of land degradation would also presumably continue. All existing tree and scrub vegetation, including boundary hedgerows would continue to grow and mature, subject to their maintenance and management by the current landowner and adjoining occupiers, as appropriate to the circumstances.

9.6 Avoidance, Remedial & Mitigation Measures

9.6.1 Construction Phase

The building site including a site compound with site offices, site security fencing, scaffolding and temporary works will be visible during the construction phase. This is generally viewed as a temporary and unavoidable feature of construction in any setting. Other mitigation measures proposed during this delivery stage of the development, revolve primarily around the implementation of appropriate site management procedures during the construction works – such as the control of lighting, storage of materials, placement of compounds, control of vehicular access, and effective dust and dirt control measures, etc. Such mitigation is set out in the Preliminary Construction Management Plan prepared by DBFL Consulting Engineers. This is a working document which will be continually reviewed and amended to ensure effective mitigation throughout the construction period. The Preliminary Construction Management Plan references construction phase mitigation measures as relevant to the assessment of Landscape and Visual impact.

9.6.2 Operational Phase

The proposed scheme is designed to integrate well within its existing context. This will be accomplished through:

- Establishing an integrated and respectful relationship between the existing housing and the proposed development, incorporating aspects of prevalent built forms, scale, texturing, colour and materials;
- The insertion, positioning and modelling of the built elements, in order to assist in the visual reduction of the apparent mass of buildings – in particular, the siting of the higher Blocks D and E (5 and 6-storey apartment blocks, respectively) along the northern edge of the site, closer to the M50 and the siting of the 3 no. lower (3-storey) duplex blocks along the western boundary of the site, adjacent to the existing 2-storey houses on the eastern edge of the White Pines North residential development;
- Appropriate architectural detailing to assist in the respectful integration of the external building facades – including the modulation of openings and fenestration in a manner that reflects current local proportions and rhythms;
- Rationalisation of all services elements and any other potential visual clutter and its incorporation internally within building envelopes (as far as practically possible);
- Use of appropriate and harmonising colour, tones and materials;
- The provision, maintenance and management of a sensitively considered soft landscape design for the development, which assists in the integration and screening of the buildings within the existing landscape.

9.7 Residual Impacts

9.7.1 Introduction

The proposed development will impact on the landscape to varying degrees in terms of its perceived nature and scale. These impacts are tempered and conditioned by sensitivities associated with the receptor, however the adjacent and surrounding land uses are also residential in character so adverse sensitivity on the basis of the nature of the development would not be expected. The duration of such impacts is however determined by the design life of the proposed development as tempered by the mitigating effect of the maturing designed landscape proposed as an integral part of the development. In this case the development has an expected life of up to 60 years. Impacts on landscape character are therefore deemed to be of long-term duration in this instance.

In assessing the landscape character impacts specifically, there are three main inter-related aspects to be addressed in considering the development proposals, namely:

- The perceived character of this existing landscape at the residential urban edge/rural landscape – how it is impacted by the proposal;
- Impacts of the proposed development on social and cultural amenity and;
- The proposed views of the development relative to the existing site (outlined in 9.8) and the associated impact on visual amenity.

9.7.2 Construction Phase

Initially the erection of site hoarding and tree protection fencing will be completed, site access points established and site accommodation units placed. Early in the construction period, topsoil stripping and excavations for building foundations will commence. Removal and/or storage of excavated materials from site and the delivery of construction materials will generate increased traffic within, to and from the site.

As construction progresses over the construction period, visual impacts will vary, with the on-going business of construction - delivery and storage of materials, the erection of the buildings, etc. Mitigation measures have been proposed as per section 9.6.1 ‘Avoidance, Remedial and Mitigation Measures’ to minimise the impact of the construction works on the site environs.

People living in the existing residential estate to the west of the site will be impacted negatively to a slight extent by the construction of the proposed development. For the more sensitive of these receptors (occupiers of existing houses backing onto the subject site boundary), the visual impact of the proposed development during construction will vary from slight and neutral to moderate and negative, depending on the stage of construction, and the intensity of site activity. The construction impacts will be of short-term duration.

9.7.3 Operational Phase

9.7.3.1 Impact on the landscape character of the area and on social and cultural amenity

Whilst the term 'landscape character' is generally held to involve more than simply appearances, there is little doubt that a place's visual qualities contribute most to its character. Generally speaking, this is particularly so for say, visitors whose experience is often fleeting. In the context of the proposed development, impacts will typically be felt by people who live nearby, who may no longer enjoy a prospect of the green fields behind them, rather a view (albeit in some areas, filtered by retained hedgerows and trees) of a housing scheme similar in many respects to that in which they themselves live.

One might surmise that the current landscape character of this area is perceived largely by local people as essentially former agricultural land located in the Dublin suburbs. However, the actual visual penetration into the site from the main public access routes is somewhat limited due largely to the presence of existing intervening groups of trees and hedgerows – this has the effect of limiting impact to those residing more closely to the site.

It is clear that the insertion of any proposed development into this existing, fairly open site will alter the landscape context of the area to an extent, however this is an emerging, planned trend in the area. In addition, clear views into the site are actually quite limited and this will limit associated impacts.

The existing site with limited access into it, offers little in the way of an amenity resource for the local populace. The proposed development will not greatly alter that, but will provide open space amenities for residents. The scheme design provides linkage into and through the scheme as appropriate, for both vehicles and pedestrians.

9.7.3.2 Visual impact

The assessment of visual impact is determined through the comparison of 'before' and 'after' photomontages – it is therefore, perhaps, a little less subjective than an assessment of landscape character. It too is inevitably influenced to some extent by the standpoint of the viewer (the receptor). The assessment of visual impacts created by the proposed development includes a consideration of the visual impacts on the visual environment likely to be impacted. A total of 17 photomontages has been prepared that illustrate the visual impact of the proposed development on the surrounding landscape. They will be included in a separate A3 report submitted with the planning application for the proposed development. In this photomontage report the existing view from each viewpoint is shown together with the proposed development as seen from the same viewpoint. The red line that appears on some of the proposed photomontages indicates the location of the new development in the background, which in such cases is largely screened from view by distance, the intervening built environment, topography or vegetation.

Because the design life of the proposed development is up to 60 years, the duration of predicted visual impacts is assessed as long term, as is the case for residual landscape character impacts (section 9.7.3.1).

The assessment of visual impacts through the use of comparative photomontages serves to identify impacts upon the visual environment. The photomontages are important in

illustrating the impact of the proposed scheme from the more sensitive viewpoints. In this instance, they also serve to support and illustrate an aspect of the landscape character impact assessment.

It is important to remember that whilst photomontages are a useful tool in illustrating comparative visual impact, they are recognised as having their limitations and potential dangers. The guidelines for their use in assessment clearly advocate their use in the context of a site visit to the viewpoint locations and point out that photomontages alone should not be expected to capture or reflect the complexity underlying the visual experience (refer to the GLVIA, 3rd Edition and the Landscape Institute's Advice Note 01/11).

9.8 Assessment of views

Photomontages were prepared for 17 views from a range of viewpoints. For each view, the significance/magnitude and quality/sensitivity of the impact are assessed as follows:

View 1:

This is a view from the road bridge carrying Stocking Lane over the M50, looking west. The road and the bridge parapet dominate the view and lead the eye to the left. However, whilst this reduces any direct visual impact, the parapet is fairly transparent.

The red line in the 'proposed' view indicates the outer profile of the proposed development, beyond the M50 tree screen. The proposed development will not be visible from the bridge.

The visual impact from this location will be **imperceptible**.

View 2:

This is a view from the upper (eastern) end of Stocking Avenue, near the roundabout junction with Stocking Lane, looking west down Stocking Avenue. Within the existing view, there is visual emphasis on the Avenue with its footway/cycleway, white lines and wall-mounted railings. Beyond the railings the western suburbs of Dublin city can be seen in the distance.

In the proposed view, the development becomes visible, particularly on the right of view. None of the blocks break the skyline and a substantial portion of the development is screened by the existing trees being retained on the eastern boundary of the site. The visible part of the proposed development to the right of view is largely screened by the wall and railings in the foreground. The scale of the development always appears totally appropriate in this view.

The visual impact from this location will be **slight and neutral**.

View 3:

This is a view from a location on Stocking Avenue, just west of View 2 and closer to the site, looking north-westwards. As was the case for View 2 the road and associated boundary edge treatment visually dominates. Stocking Lane RCP sits in behind the railings, on the right of view with the mature trees (to be retained) in the centre.

The proposed development will be just visible to the right of view and is barely perceptible beyond the retained mature trees which sit on the eastern boundary of the subject site. The building finishes in warm pale tones, softly merge with the sky light, thereby assisting in reducing apparent scale and bulk. Being at a lower level, their apparent height is significantly less than their maximum 6 storeys.

The visual impact from this location will be **slight and neutral**.

View 4:

This is a view from Stocking Avenue, just west of the site, looking north-east. Again, the roadway, edged with its stepped, wall-mounted railings dominates the view and visual focus tends to follow up to the right. The existing White Pines (North) development is visible in the left of view and is partially screened by the existing trees. Save for the mature trees right of centre in the distance, it is a relatively bleak view.

In the proposed view, to the right of centre, the gateway pillars and roadside planting, with the 5-storey Block A behind, announce the new site entrance into the White Pines East development. The sole visible building representing the development along the road, is in no way over-dominant and is an appropriately scaled marker for the proposed scheme along Stocking Avenue, though the view to the existing mature trees in the distance is now blocked. The proposed development sits well with the existing and actually gives some sense of purpose to the road.

The visual impact from this location will be **moderate and neutral**.

View 5:

This is a view from the roundabout junction of Stocking Avenue with White Pines Way (at the entrance to the existing White Pines (North) development. The view looks north-east. The roundabout and the existing housing beyond dominate the view and confirm the residential character of the area.

The very top of the proposed development will be visible beyond the existing housing, but this is really rather marginal. The built elements of the proposed development appear distinct and separated from one another, with the only clue to their association being their finished tone and colouring. They present as unified but quite distinctively different from the existing

residential development in front of it. This is however an appropriate expression of the different residential type.

The visual impact from this location will be **slight and neutral**.

View 6:

This is a view from Stocking Avenue, west of View 5, looking east. As was so for View 5, the roadway and the existing White Pines (North) development dominate the view. The roadside trees will mature and particularly in summer will provide an element of greening and screening in the scene.

The pale tones of the proposed development are barely perceptible to the right of the view, beyond and above the existing development. In summer it will not be visible from this location due to the screening created by the intervening roadside trees when in full leaf. The visible part of the development occupies a very small portion of the field of view.

The visual impact from this location will be **slight and neutral**.

View 7:

This is a view from the roundabout at the junction of Stocking Avenue with Stocking Well Row and Stocking Wood Drive, looking east. The roundabout, with the Stocking Wood development to the right of view, visually dominate the view, but are balanced somewhat by the open space with mature trees to the left of view.

In the proposed view a very thin sliver of a roofline of one of the blocks of the proposed development is barely visible beyond the White Pines (North) development in the distance. Both occupy a very small portion of the field of view and make little if any impact in the view.

The visual impact from this location will be **imperceptible**.

View 8:

This is a view from a location near the junction of Stocking Avenue and Ballycullen Road, looking east. The road, its street trees and boundary wall-mounted railing dominate with the existing residential developments either side.

A very small part of the proposed development becomes just visible on the horizon but occupies such a small portion of the field of view as to be barely perceptible from this location.

The visual impact from this location will be **imperceptible**.

View 9:

This is a view from Stocking Lane across from the entrance to Rathfarnham Golf Club, looking north. This view is from an elevated position looking beyond the recent housing development in the middle ground (left of view), down into the Liffey valley and over the western suburbs of Dublin. The existing powerlines above and the pylon are a small negative feature in the existing view.

The top level of a very small part of the proposed development becomes just visible as a minor insertion into the existing trees and hedgerows in the view and it never breaks the horizon. It appears as simply another, but a small built element in the middle distance, gently confirming the transition from urban to rural.

The visual impact from this location will be **slight and neutral**.

View 10:

This is a view from the upper end of Stocking Lane, some 800m south of the site. The mature trees continue some distance down the road from this bend.

In the proposed view, the red line denoting the outer profile of the proposed development confirms it will not be visible from this location.

Visual impact from this location will be **imperceptible**.

View 11:

This is a view from Orlagh Avenue (near the M50 on-slip at Scholarstown Road), looking south-westwards. The large open grass space in the foreground offers potential for visibility of the proposed development in the distance. The Dublin Mountains rise up behind the detached red brick residential properties in the middle distance. The existing White Pines development is just visible through the trees to the right of these.

The proposed development, indicated by the red line, will only just appear partially above and beyond the red brick houses but will not really be at all discernible from this location. The view of the mountains in the distance remains intact.

The visual impact from this location will be **imperceptible**.

View 12:

This is a view from the southern end of Orlagh Lodge, in an existing residential neighbourhood north of the proposed development across the M50. This is a view looking south-east towards the proposed development site. The houses in this part of the Orlagh housing estate do not look towards the M50 and the road in this view is a linking road within the estate. This existing view is of the screening wall/fence and trees at the southern edge of this estate – it is a simple and austere view. Sensitivity to development across the M50 is not likely to be high.

To the left of view, a very small part of the proposed development appears in the distance above the existing wall/fence and even in winter is masked somewhat by the existing screen trees in the foreground.

The visual impact from this location will be **imperceptible**.

View 13:

This is a view from the southern end of Orlagh Wood, in the same existing residential neighbourhood as View 12. This location is east of View 12 and looking southwards across the wall/fence and tree screen in the foreground. In this view an overhead motorway signage gantry can just be seen on the left through the trees, above the wall/fence. This indicates the level of screening the trees convey even through the winter.

The proposed development lies beyond the wall and fence, across the M50 beyond, however it will not be visible from this location.

The visual impact from this location will be **imperceptible**.

View 14:

This is a view from Airpark Avenue, an existing residential estate north of the M50. The view looks south-westwards and is characterised by the residential parking, backed by the open grass space with the dense tree screen and the wall/fence beyond.

The proposed development appears above the wall/fence but is a small and distant element which is also partially masked by the trees even when not in full leaf.

The visual impact from this location will be **slight and neutral**.

View 15:

This is a view also from Airpark Avenue, but approx. 200m further east than View 14, looking westwards towards the proposed development site. The viewpoint is relatively lower with the ground to the south of the viewpoint rising up to the screening fence and planting.

In the proposed view, the red line indicating the outer profile of the proposed development, confirms the development will not be seen from this viewpoint.

The visual impact from this location will be **imperceptible**.

View 16:

This is a view from the eastern end of White Pines Meadow, within the White Pines North residential housing area, looking eastwards. The subject site is indicated by the existing hoarding in the centre of view. Green Acres House, nestled within the trees, just beyond the site can be picked out in the distance. The existing context for the viewer is clearly within a recently completed residential estate featuring high quality design and finishing.

In the proposed view, the proposed development appears as a logical extension of the existing development with the proposed 3-storey duplexes along the western edge of the site, to the rear of the existing 2-storey houses to the right of view, conveying a similar style, scale and finish as the existing. Beyond this the taller apartment blocks, appropriately distinctive in pale warm tones are of an appropriate scale and are positively counterbalanced by the adjacent open space and planting. Whilst the tree planting appears to be appropriately scaled for the purpose it serves, some of it is represented as rather mature (approx. 15- 20yrs post completion).

The visual impact from this location will be **significant and positive**.

View 17:

This is view taken from a location further west of View 16 and further away from the proposed development. Consequently, more of the existing 2-storey residential context (White Pines North) is apparent in the view. This is a high-quality scheme in terms of its design and execution. The subject site is indicated (as in View 16) by the grey site hoarding at the end of this road (White Pines Meadow).

In the proposed view, a part of the upper level of Block D (5-storeys) and beyond it, Block E (6-storeys) are just visible above the roof line of the existing housing and beyond the gable of the northernmost block of duplexes. The apartment blocks do not appear in any way to be too high in this context or over-dominating of the existing houses. The open space to the northern segment of the proposed scheme appears as a logical and inviting extension of the existing residential context.

The visual impact from this location will be **slight and positive**.

9.9 Monitoring

The retention of a substantial portion of the existing boundary hedgerows and associated mature trees coupled with the effective use of new planting to screen and integrate the built elements of the proposal into the existing landscape are important aspects of the proposed scheme design. The success of the proposed scheme is dependent on both operations being properly executed. Effective tree and hedgerow protection measures must be established in advance of construction work commencing and an approved system of monitoring the on-going health and vigour of both existing and proposed planting will be necessary. The timely planting and the maintenance and management required to successfully establish new planting with the projected rates of growth and general performance required, needs a significant and effective input from professionals with the necessary expertise to ensure it is effectively delivered. The monitoring of the planting performance and suitably appropriate responses to ensure same will be essential to the success of the development as proposed.

9.10 Cumulative Impacts

9.10.1 Introduction

Current guidelines suggest that a determination should be made as to whether cumulative effects are likely to occur – these are outlined in the current GLVIA guidelines (3rd edition) as 'additional effects caused by the proposed development when considered in conjunction with other proposed developments of the same or different types'. It has become accepted practice that such a determination generally needs to be made as to whether any likely pending or permitted development of a similar nature will have any bearing on the assessment of the proposed development and this is subject to the assessor's judgement in the matter.

9.10.2 Cumulative Impacts related to the proposed development

The Local Authority's planning strategy for this area includes for further residential development on other nearby sites. Notwithstanding this, for this proposed development, there are several reasonably substantial developments in or about to enter the planning process which could possibly be considered to be of relevance in creating such 'additional effects' or to have a bearing on this assessment.

The White Pines Central scheme, which is currently in design development will have some bearing on the impact made by this proposed development at White Pines East. Given that it is currently subject to design changes, it is intended within the planning application for the White Pines Central scheme, to also include photomontages which illustrate the proposed subject scheme in the context of the other White Pines schemes. The cumulative effects of the proposed development in this context will therefore be assessed on the basis of these supplementary photomontages, within the application for the White Pines Central scheme.

REFERENCES

- Guidelines on the information to be contained in Environmental Impact Statements prepared by the Environmental Protection Agency (EPA) 2002.
- Revised guidelines on the information to be contained in Environmental Impact Statements - Environmental Protection Agency (EPA), DRAFT, September 2015.
- DRAFT 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' - Environmental Protection Agency (EPA), August 2017.
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements - Environmental Protection Agency (EPA), September 2003.
- Guidelines for Landscape and Visual Impact Assessment, prepared by the Landscape Institute and the Institute of Environmental Assessment, published by Routledge , 3rd Edition 2013.
- Photography and Photomontage in Landscape and Visual Impact Assessment - Landscape Institute (UK) Advice Note 01/11.
- South Dublin County Development Plan 2016-2022.

APPENDIX A – Views from M50 Motorway

The 17 views included in the separate A3 booklet prepared by 3D Design Bureau and used for assessment in this report are 'verified views'. This means that accepted protocols are followed in their preparation to ensure a high level of accuracy. Such protocols include the survey of the viewpoint location so that the viewpoint can be inserted accurately into the model when generating the proposed development images. This way, one can be sure that the model of the proposed development is seen from the same location, height, angle etc as the baseline image and therefore that the development is seen accurately in context.

For this development, South Dublin County Council specifically requested views from the M50 motorway. So in addition, two views have been prepared from locations on the motorway - the approximate locations of which are shown in Figure 9A (below).



Figure 9A: Approximate viewpoint locations for M50 views (Source: 3D Design Bureau)

Because the locations of these views cannot be surveyed or clearly established, these views cannot be considered to be verified views. The positioning of the viewpoint in the model requires a degree of informed guesswork, however it is still guesswork. Whilst these two additional images cannot be considered accurate enough for inclusion in the assessment of impacts, they are nevertheless considered to be as accurate as circumstances permit. The outline commentary provided with these two additional views is for information only and should under no circumstances be construed as part of the assessment.

M50 View 1:



Figure A9.1.1: M50 V1 – Existing



Figure A9.1.2: M50 V1 – Proposed

M50 View 2:



Figure A9.2.1: M50 V2 – Existing



Figure A9.2.2: M50 V2 – Proposed

In both of the views provided, the taller 6-storey Block E adjacent to the motorway will be visible, though in both views it does not appear as 6 storeys, rather as 4 or 5 storeys – this is possibly due to the array of flanking walls, fences and patchy planting at the motorway edges. However, whether the development is perceived as 4 storeys or 6 storeys is rather immaterial since either would be entirely appropriate in the context of the motorway width, it's bigger scale in general and in the context of the circumstances and speed at which the viewer (the receptor) is travelling on the road. To someone on the motorway, the motorway dominates the view and demands the attention of the driver at least - as it should.

The receptor, whether local inhabitant or visiting tourist is going to pay scant attention to this development, if any, in the overall scale at which their perceptive faculties are functioning whilst on the motorway. Motorways constructed in urban contexts tend to pick their way through a vast range of building types and scales – that is the nature of the beast and the M50 is no exception. The visiting tourist drives along it and is left with an overall but rather vague impression of the urban landscape he/she has just passed through. Local inhabitants may use some adjacent buildings as locators for their exit. In this specific existing context, neither is particularly sensitive to views from the motorway and to them, this proposed development will simply be another few buildings along the way.

10.0 HYDROLOGY

10.1 Introduction

This chapter of the EIAR comprises of an assessment of the likely impact of the proposed development on the surrounding surface water and hydrogeological environments (including flood risk, surface water drainage, foul drainage and water supply) as well as identifying proposed mitigation measures to minimise any impacts.

In summary, the proposed development ("the site") comprises of 241 No. residential units, residential tenant amenity space (reception area, games space, residents lounge and gym) and dedicated community space on a 2.98 Ha site.

The proposed development will also include the following associated engineering infrastructure:

- Formation of an access onto Stocking Avenue to facilitate the primary vehicle access to the site (including minor modifications to existing pedestrian and cycle facilities along Stocking Avenue and relocation of a bus stop.
- Provision of internal site roads including associated footpaths.
- Provision of surface water drainage, foul drainage and water supply infrastructure.

The proposed development will also include the following associated engineering infrastructure:

- Formation of an access onto Stocking Avenue to facilitate the primary vehicle access to the site (including minor modifications to existing pedestrian and cycle facilities along Stocking Avenue and relocation of a bus stop).
- Provision of internal site roads including associated footpaths.
- Provision of surface water drainage, foul drainage and water supply infrastructure.

The proposed surface water drainage network accords with SUDS principles, forms a single catchments and discharges to an existing 375mm diameter surface water drain (which runs along the site's northern boundary) at a controlled greenfield runoff rate of 3.9 L/Sec/Ha.

The proposed development's foul drainage network discharges to an existing 300mm diameter foul sewer located along the site's northern boundary. Pre-Connection Feedback has been received from Irish Water which advises that "*Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the networks(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated*".

An existing 500mm diameter water main runs along the southern side of Stocking Avenue. An existing 150mm diameter water main network is also located within the Stocking North development (SD14A/0222) which is located immediately west of the site. The proposed development's water supply is to be taken from the 500mm diameter water main on Stocking Avenue and connect back into the 150mm diameter network located within Stocking North.

Existing 12" and 15" diameter bulk water mains traverse the site from west to east (in the vicinity of the site's northern extents). Irish Water has a wayleave over these water mains.

As noted previously, Pre-Connection Feedback received from Irish Water advises that "Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the networks(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated"

10.2 Methodology

10.2.1 Source of Information

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

- Site inspection / walkover
- Review of existing topographic survey information
- Review of Irish Water utility plans (surface water drainage, foul drainage and water supply)
- Ground investigations including trial pits and infiltration 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)
- Consultation with South Dublin County Council's Water Services Section
- Consultation with Irish Water
- Submission of a Pre-Connection Enquiry Application to Irish Water

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 Pre-Connection Enquiry Application (water demand and foul drainage discharge)

10.3 Receiving Environment (Baseline Situation)

10.3.1 Hydrology

The primary hydrological features in the vicinity of the site are the Owendoher Stream (approx. 0.9km to the East), the Orlagh Stream (approx. 1.0km to the West) and the Dodder River (approx. 2.0km to the North). Refer to Figure 10.1 for the location of the hydrological features noted above.

As noted previously, an existing 375mm diameter surface water drain runs along the site's northern boundary, falling from east to west (refer to Figure 10.2).

As the site generally falls from south to north, the existing 375mm diameter surface water drain noted above will provide a suitable surface water outfall for the proposed development.

The existing 375mm diameter surface water drain noted above outfalls via a pipeline under the M50 and onwards through piped networks in the Scholarstown / Knocklyon areas (ultimately discharging to the River Dodder).

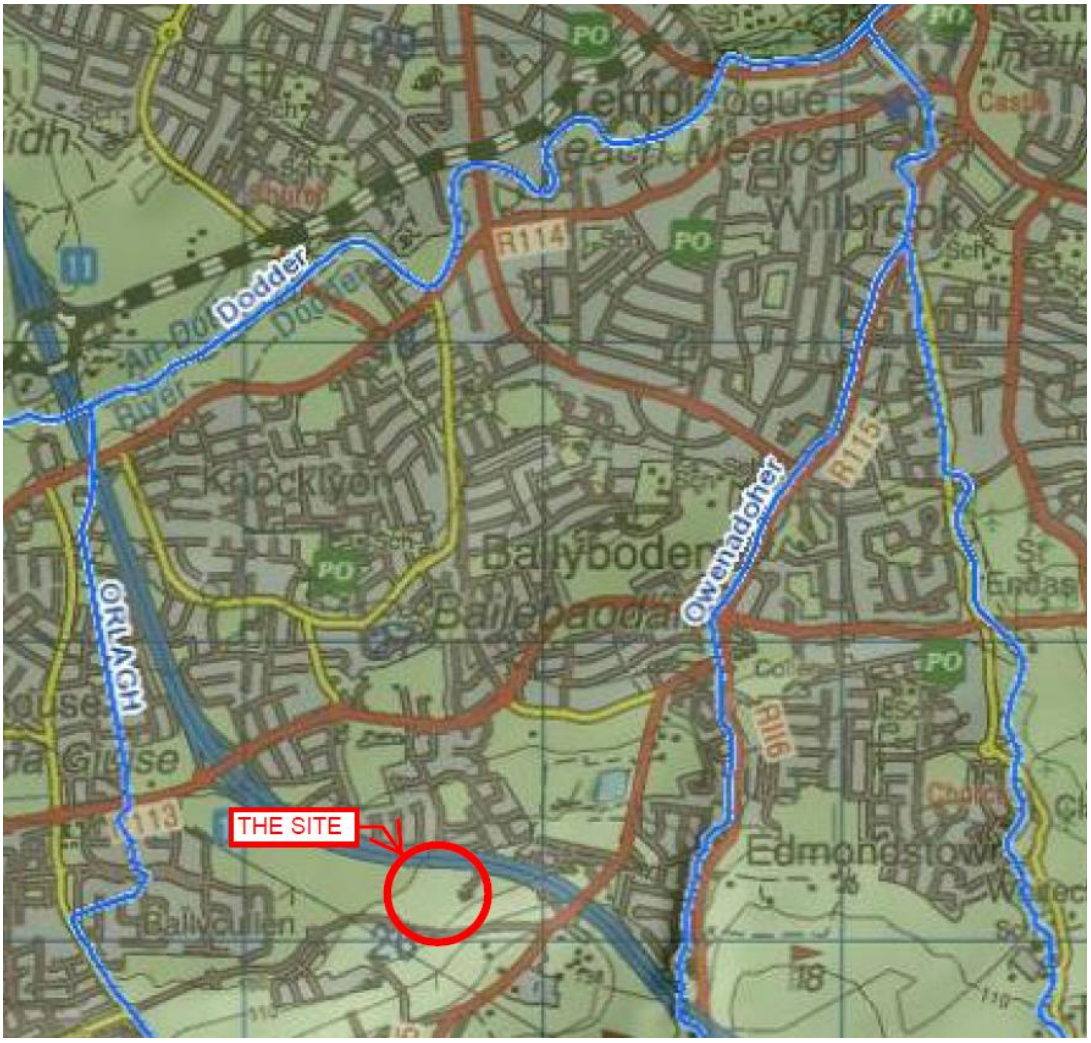


Figure 10.1: Extract from EPA Online Mapping Service

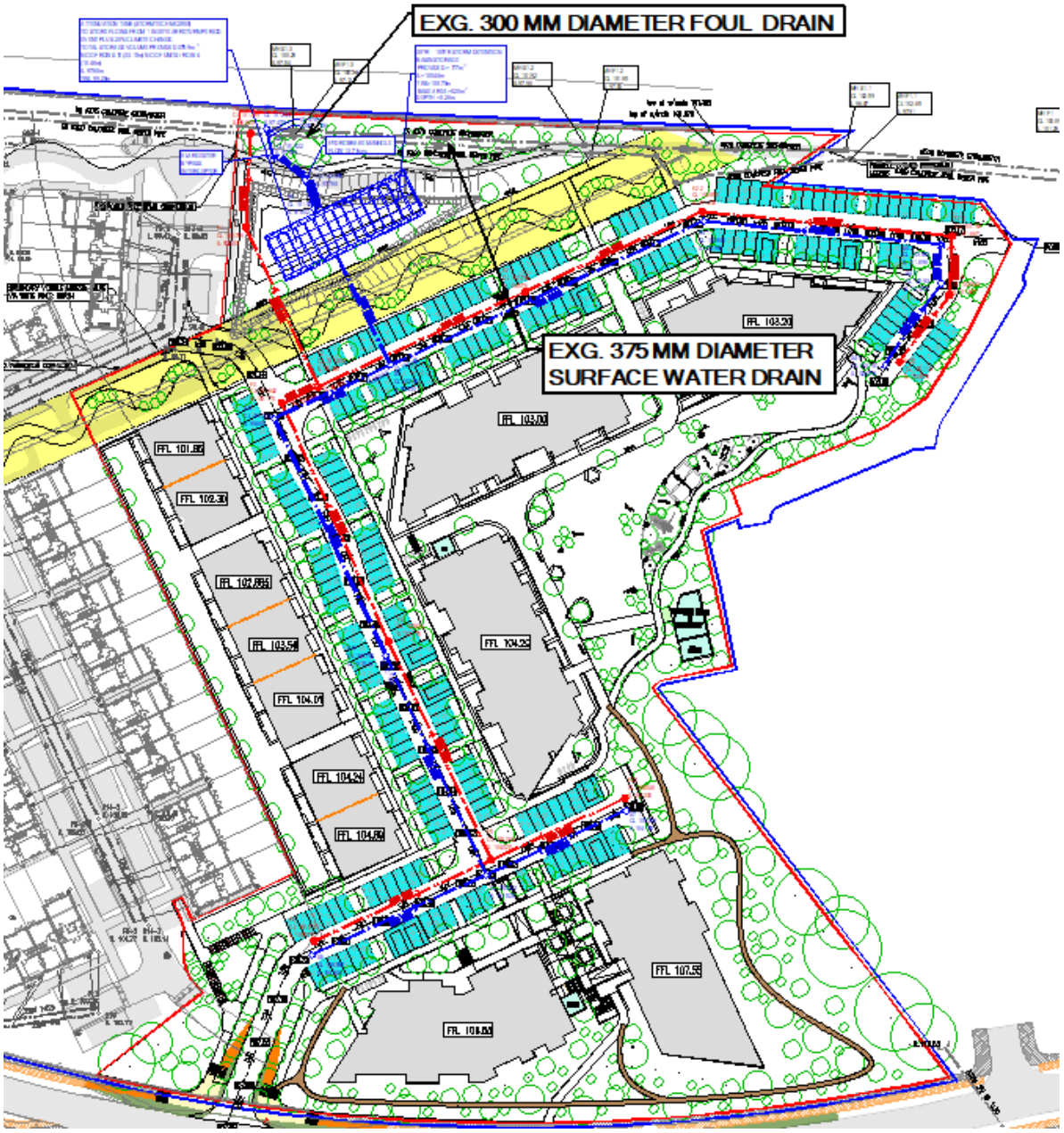


Figure 10.2: Extract from DBFL Site Services Plan

10.3.2 Hydrogeology

GSI's Groundwater Data Viewer indicates that the site is located on a "Bedrock Aquifer" and classifies the underlying aquifers as "Locally Important Aquifer – Bedrock which is Moderately productive only in local zones". Refer to Figure 10.3.

GSI generally classifies the site's groundwater vulnerability as "High" for the majority of the site with "Moderate" in a small portion of the site (adjacent to the site's northern boundary). Refer to Figure 10.4 below.

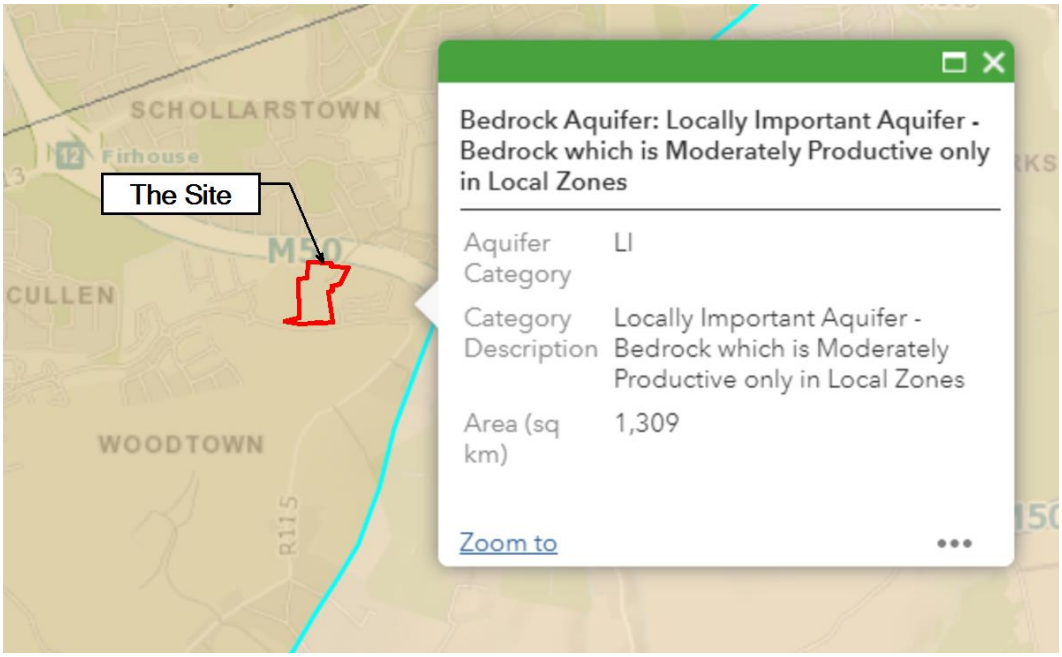


Figure 10.3: Groundwater Aquifers Map(source GSI online mapping service, 23/03/2020)

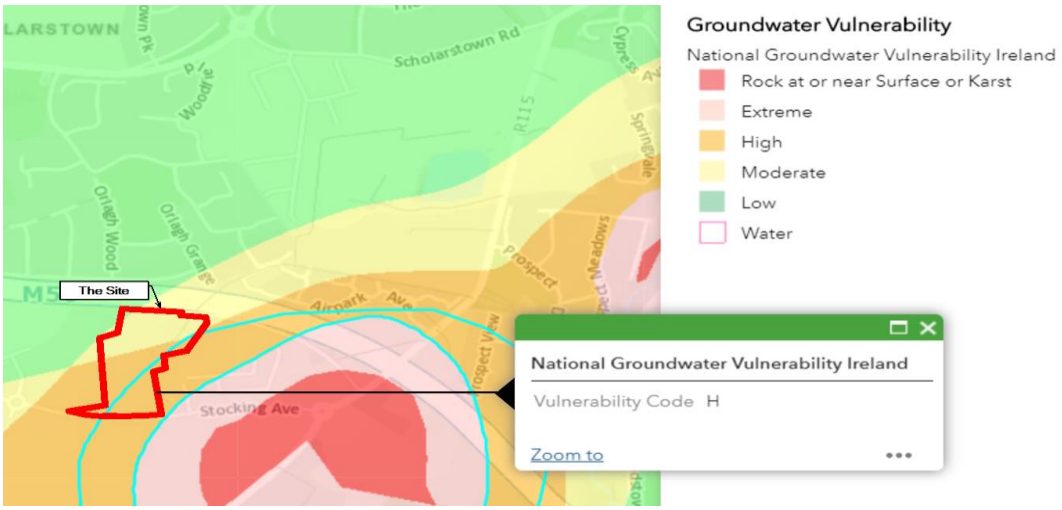


Figure 10.4: Groundwater Vulnerability Map(source GSI online mapping service, 23/03/2020)

10.3.3 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) and the Eastern CFRAM Study.

This assessment has been carried out in accordance with the procedures for a "Flood Risk Assessment" as outlined in the OPW's Guidelines for Planning Authorities – The Planning System and Flood Management (November 2009).

OPW Flood Hazard Mapping
OPW's Summary Local Area Report is included in Appendix 10.A (Flood Hazard Information). This report is sourced from the OPW website (www.floodmaps.ie) and summarises all flood events within 2.5 km of the site. No flood events or benefitting lands are noted in the immediate vicinity of the site.

Eastern CFRAM Study
Extracts from the Dodder Catchment Flood Risk Assessment and Management Study are included in Appendix 10-A (Flood Hazard Information) which indicates the extent of fluvial flooding in the vicinity of the site.
The closest modelled node to the site is located on the Owendoher River (approx. 900 m east of the site. No fluvial flooding in indicated in the vicinity of the site.

10.3.4 Foul Drainage

Existing public foul drainage infrastructure is located along the northern boundary of the site (refer to Figure 10.2). As the site falls from its northern boundary toward its southern boundary, this existing infrastructure will facilitate a gravity foul drainage connection.

As previously noted, Pre-Connection Feedback has been received from Irish Water advises that "Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the networks(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated".
Refer to Appendix 10.B for Correspondence with Irish Water.

10.3.5 Surface Water Drainage

Existing public surface water drainage infrastructure is located along the northern boundary of the site (refer to Figure 10.2) and outfalls via a pipeline under the M50 and onwards through piped networks in the Scholarstown / Knocklyon areas (ultimately discharging to the River Dodder).

As the site falls from its southern boundary toward its northern boundary, this existing infrastructure will facilitate a gravity surface water drainage connection.

10.3.6 Water Supply

An existing 500mm diameter water main runs along the southern side of Stocking Avenue. An existing 150mm diameter water main network is also located within the Stocking North development (SD14A/0222) which is located immediately west of the site. The proposed development's water supply is to be taken from the 500mm diameter water main on Stocking Avenue and connect back into the 150mm diameter network located within Stocking North.

As previously noted, Pre-Connection Feedback has been received from Irish Water advises that "Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the networks(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated"
Refer to Appendix 10.B for Correspondence with Irish Water.

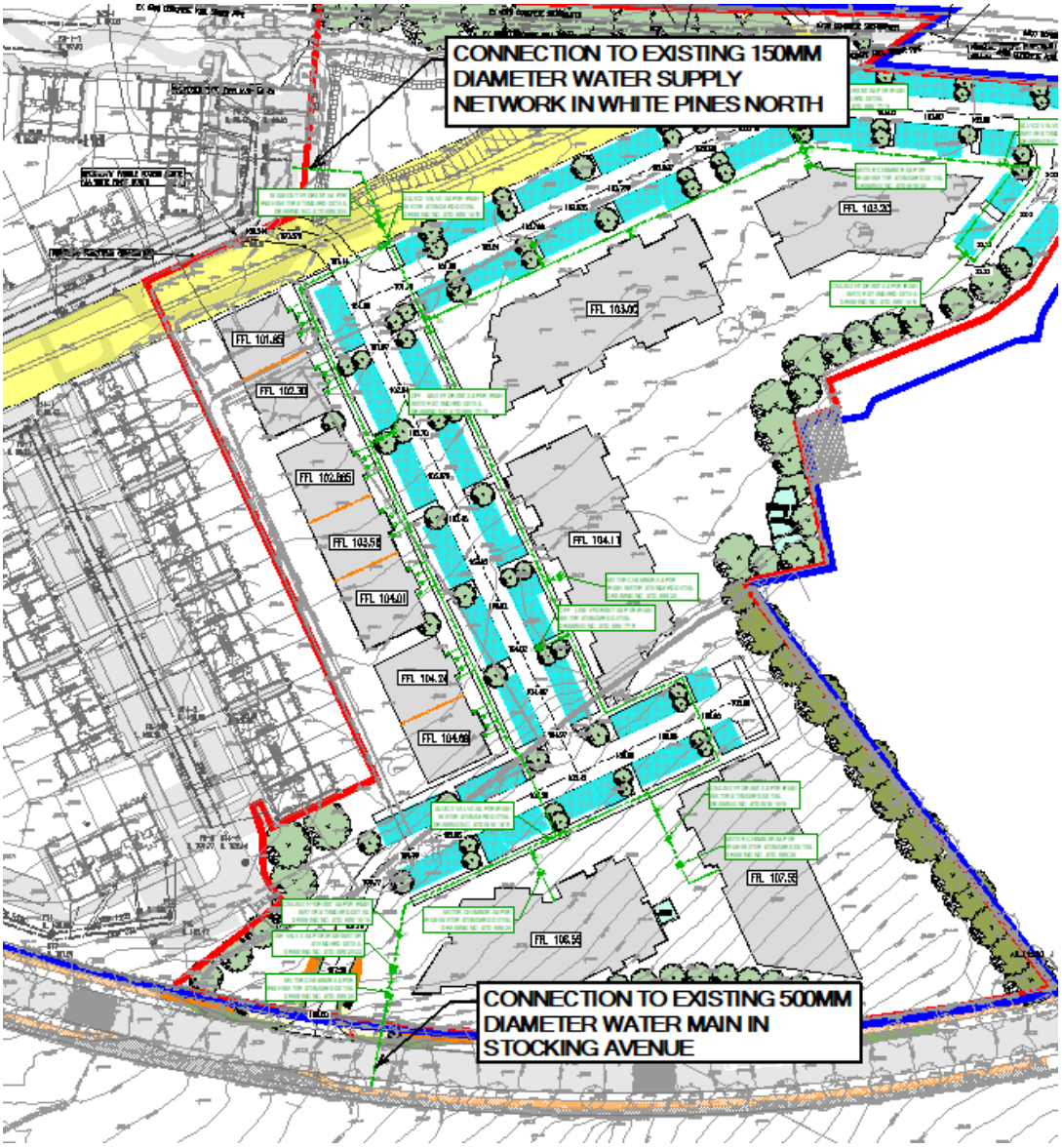


Figure 10.5: Extract from DBFL Watermain Layout

10.4 Characteristics of the Proposed Development

10.4.1 Hydrology

The proposed development is located a minimum distance of 0.9km from the primary hydrological features in the vicinity of the site (Orlagh Stream, Owendoher Stream and the Dodder River).

No adverse effects on surrounding hydrology is anticipated as surface water flows are attenuated to greenfield runoff rates in conjunction with implementation of SUDS strategies such as permeable paving, green roofs and installation of a Class 1 full retention fuel / oil separator.

Refer to DBFL's Infrastructure Design Report (190230-rep-001) for full details of the proposed SUDS methodologies.

10.4.2 Hydrogeology

During site investigations, groundwater ingress was observed at trial pits located in the southern portion of the site (at depths ranging from 0.9m and 2.8m below existing ground level). As such, there may be a need to dewater excavations during construction. Also refer to EIAR Chapter 8 (Lands and Soils).

In general, the designed ground floor levels and external pavement levels have been designed to follow the natural topography of the site, therefore minimising the need for excavation to enable development. As such, the deepest excavations are expected to be required for installation of the attenuation tanks (up to approximately 3.0m below existing ground level).

It is not envisaged that the proposed development works will have any direct impact on the underlying hydrogeology.

10.4.3 Flood Risk

A Site-Specific Flood Risk Assessment for proposed development was undertaken in accordance with the requirements of "The Planning System and Flood Risk Management, Guidelines for Planning Authorities" and its Technical Appendices.

Following the Flood Risk Assessment, it was determined that the site is located in Flood Zone C as defined by the Guidelines. It concluded that the;

- The proposed development is appropriate for the site's flood zone category.
- The sequential approach outlined in the Guidelines has been adhered to and that the 'Avoid' principal has been achieved.

The proposed development is considered to have the required level of flood protection up to and including the 1% AEP flood event. Overland flow paths have been identified for pluvial flooding exceeding the capacity of the surface water drainage network.

10.4.4 Foul Drainage

The topography of the site generally falls from the southern boundary of the site towards the northern boundary at gradients ranging from 1/10 to 1/30 i.e. foul drainage flows by gravity towards the site's northern boundary.

The proposed foul drainage network will connect by gravity into the existing 300mm foul sewer along the northern boundary of the site.

The proposed foul drainage network comprises of a network of 225mm diameter pipes with individual units being serviced by individual 100mm diameter connections.

The foul drainage network for the proposed development has been designed in accordance with 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 Irish Waters "Code of Practice for Wastewater Infrastructure" IW-CDS-5030-03.

A daily foul discharge volume of 107m³ has been calculated as outlined in Irish Water's Pre-Connection Enquiry Application Form.

10.4.5 Hydrology

Surface water runoff from the site's street network are directed to tree pits via conventional road gullies (with high level overflow to the piped surface water network) while surface water runoff from on street parking areas will be captured by permeable paving.

Surface water runoff from duplex roofs (along the site's western boundary) will be routed to the proposed surface water pipe network via the porous aggregates beneath permeable paved parking areas (providing an additional element of attenuation.

Surface water runoff from apartment roofs will be captured by green roofs (sedum blanket) prior to being routed to the piped surface water drainage network.

The site catchment has been assessed in relation to surface water attenuation. Surface water discharge rates from the proposed surface water drainage network will be controlled by a Hydrobrake type flow control device and associated underground attenuation tanks and surface level drainage basin.

Surface water discharge will also pass via a full retention fuel / oil separator (sized in accordance with permitted discharge from the site) before leaving the site. Refer to DBFL's Infrastructure Design Report (190230-rep-001) for full details of the proposed SUDS methodologies. Surface water calculations are based on an allowable outflow / greenfield runoff rate of 3.9 l/sec/ha resulting in a total attenuation volume of 641 m^3. Supplementing this storage volume is a further approx. 175m3 of additional storage in SUDS measures (i.e. voids in aggregates beneath permeable paving).

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.

10.4.6 Water Supply

An existing 500mm watermains is located along the South side of Stocking Avenue (refer to Figure 10.6). it is proposed for the development to take a 200mm diameter watermain from the existing infrastructure on Stocking Avenue. Which will also connect to Stocking North creating a single looped connection to serve the development.

All connections, valves, hydrants, meters etc. have been design and are to be installed in accordance with Irish Water's Code of Practice / Standard Details and the Department of the Environment's Building Regulations "Technical Guidance Document Part B Fire Safety".

A post development average hour water demand of 1.41 l/sec and a post development peak hour water demand of 7.06 l/sec has been calculated as outlined in Irish Water's Pre-Connection Enquiry Application Form.

10.5 Potential Impacts of the Proposed Development

10.5.1 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 may also contain increased silt levels (potential impact on existing hydrology e.g. accidental discharge to existing surface water drainage network).
- Accidental spills and leaks associated with storage of oils and fuels, leaks from construction machinery and spillage during refuelling and maintenance.
- Concrete runoff, particularly discharge of wash water from concrete trucks. (potential impact on existing hydrology e.g. infiltration to ground).
- Discharge of vehicle wheel wash water (potential impact on existing hydrology e.g. discharge to existing surface water drainage infrastructure).
- Improper discharge of foul drainage from contractor's compound (impact on existing hydrology e.g. cross-contamination of existing surface water drainage.).
- Cross contamination of potable water supply to construction compound.

10.5.2 Operational Phase

Potential operational phase impacts are noted below:

- Increased impermeable surface area will reduce local ground water 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 of 107m³).
- Increased potable water consumption (post development average hour water demand of 1.41 l/sec).

10.5.3 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.

No potential cumulative impacts are anticipated in relation to foul drainage and water supply. As noted previously, Irish Water have advised that "Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the networks(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated".

10.5.4 Do Nothing Scenario

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

10.6 Mitigation Measures

10.6.1 Construction Phase

The following measures are proposed during the construction phase to mitigate against risks to the surrounding hydrological environment:

- 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.
- 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 to the surface water network at a controlled rate.
- Weather conditions and typical 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 should be stored in a secure bunded hardstand area. Refuelling 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 (at authorized concrete batching plant in full compliance with relevant planning and environmental consents).
- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
- 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 tankered 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 protected from contamination by any construction activities or materials.

10.6.2 Operational Phase

Following the Site Specific Flood Risk Assessment, it has been determined that the proposed development is located in Flood Zone C as defined by the Guidelines i.e. proposed development is considered to have the required level of flood protection up to and including the 1% AEP flood event.

Proposed mitigation measures to address residual flood risks are summarised below;

- Proposed drainage system to be maintained on a regular basis to reduce the risk of a blockage.
- In the event of storms exceeding the 1% AEP design capacity of the attenuation system, possible overland flow routing towards open space areas should not to be blocked.

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 below ground attenuation storage.

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

- Surface water runoff from the site's street network are directed to tree pits via conventional road gullies (with high level overflow to the piped surface water network) while surface water runoff from on street parking areas will be captured by permeable paving.
- Surface water runoff from duplex roofs (along the site's western boundary) will be routed to the proposed surface water pipe network via the porous aggregates beneath permeable paved driveways
- Surface water runoff from apartment roofs will be captured by green roofs (sedum blanket) prior to being routed to the piped surface water drainage network
- Attenuation of the 30 year and 100 year return period storms
- Installation of a Hydrobrake (limiting surface water discharge from the site to 3.9 l/sec/ha)
- Surface water discharge will also pass via a fuel / oil separator (sized in accordance with permitted discharge from the site).

A contract will be entered into with a suitably qualified contractor from maintenance of the attenuation system, Hydrobrake and full retention fuel / oil separator noted above.

No specific mitigation measures are proposed in relation to foul drainage however, all new foul drainage lines will be pressure tested and 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 water cisterns and low flow taps will be included in the design.

The potential impact of climate change has been allowed for as follows;

- Pluvial flood risk - attenuation storage design allows for a 10% increase in rainfall intensities.
- Pluvial flood risk - drainage system design allows for a 10% increase in flows, as recommended by the GDSDS.
- Provision of min. freeboard (500mm) from 1% AEP as required by GDSDS (mitigation against impact of climate change).

10.6.3 Do Nothing Scenario

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

10.7 Predicted Impact of the Proposed Development

10.7.1 Construction Phase

Implementation of the measures outlined in Section 10.6.1 will ensure that the potential impacts of the proposed development on water and the hydrogeological environment do not occur during the construction phase.

10.7.2 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.

10.7.3 Do-Nothing Scenario

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

10.8 Monitoring Measures

Construction Stage

Proposed monitoring during the construction phase in relation to the water and hydrogeological 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)

Operational Stage

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

10.9 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 licensed 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.

10.10 Interactions and Potential Cumulative Impacts

10.10.1 Interactions

Lands, Soils and Geology

Surface water runoff during the construction phase may lead to erosion and contain increased silt levels (e.g., runoff across areas stripped of topsoil) or become polluted by construction activities.

Increased impermeable surface area will reduce local ground water recharge and potentially increase surface water runoff (if not attenuated to greenfield runoff rate).

Refer to the Lands, Soils and Geology Chapter (Section 8.6) for proposed mitigation measures.

10.10.2 Potential Cumulative Impacts

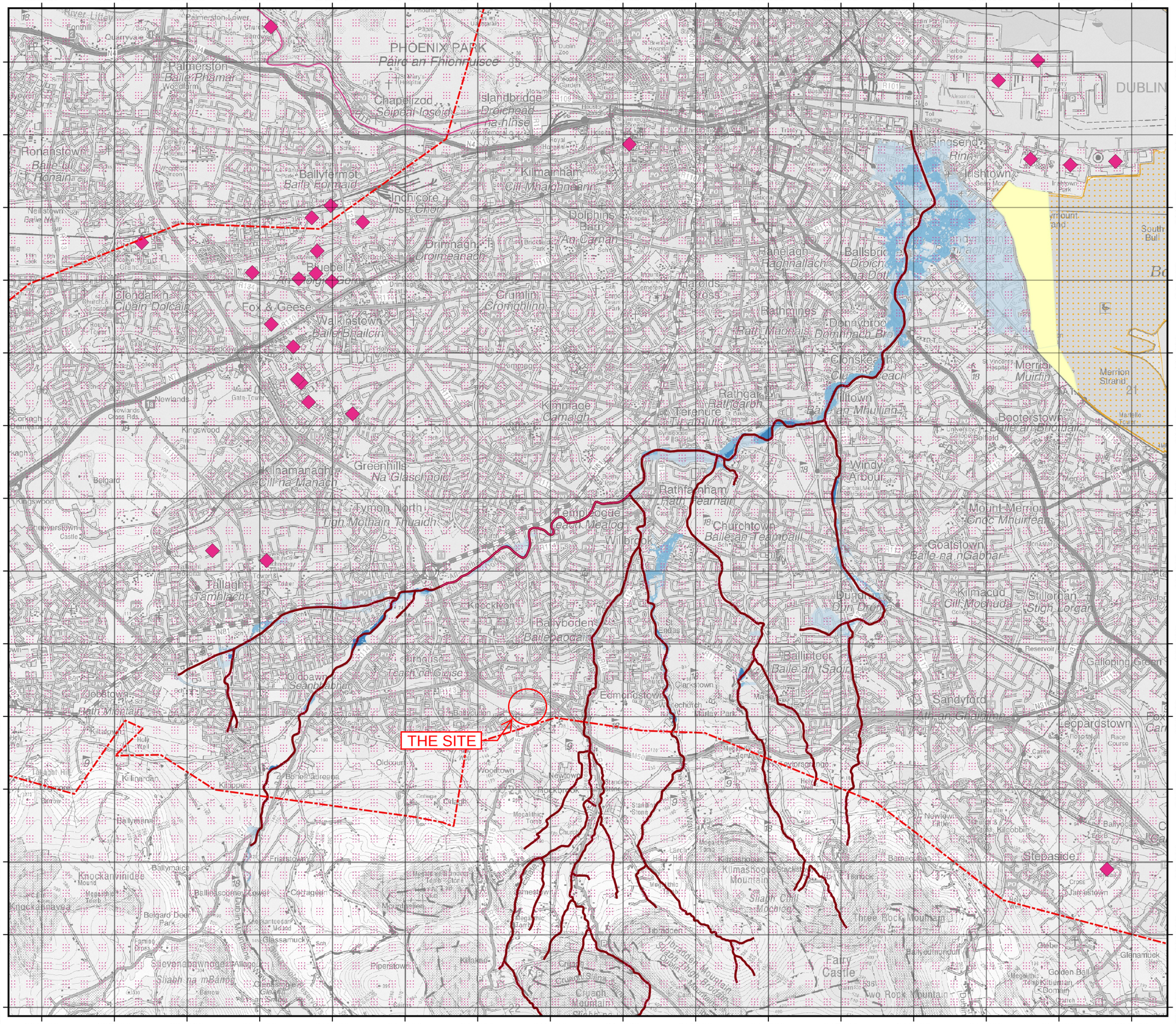
The proposed surface water drainage infrastructure has been designed in accordance with the relevant guidelines. Any other developments currently under construction or other committed development in the vicinity of the site would have to be similarly designed in relation to permitted surface water discharge, surface water attenuation and SuDS, therefore, no potential cumulative impacts are anticipated in relation to surface water drainage and flooding.

No potential cumulative impacts are anticipated in relation to foul drainage and water supply. Irish Water have confirmed that the proposed foul drainage connection and proposed connection to the existing water supply network are feasible (refer to Section 10.3.4 and Section 10.3.6).

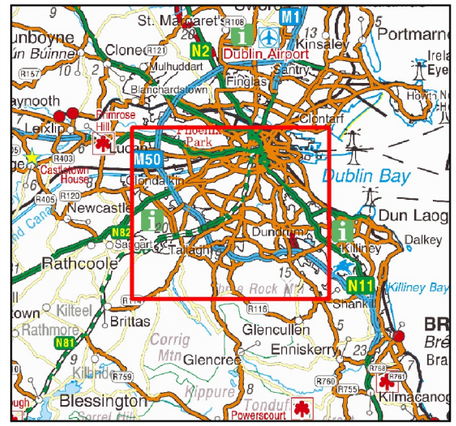
10.11 REFERENCES

- Irish Water Record Drawings,
- Flood Hazard Information,
- Correspondence with Irish Water,
- GII site investigation report.

APPENDIX 10-A
FLOOD HAZARD INFORMATION



Location Plan:



LEGEND

- AFA Boundary
- IED Sites
- Designated for Drinking Water Abstraction
- Designated for Drinking Water Abstraction
- Recreational Waters
- SAC Water Dependent
- SAC Water Dependent
- SAC Water Dependent
- SPA Water Dependent
- Modelled River Centreline
- 10% AEP Fluvial
- 1% AEP Fluvial
- 0.1% AEP Fluvial

IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

OPW
Oifig na nOibreacha Poiblí
The Office of Public Works

The Office of Public Works
Jonathan Swift Street
Trim
Co. Meath

Project:

DODDER STUDY

Map: **DUBLIN CITY FLUVIAL GENERAL RISK - ENVIRONMENT**

Map Type:	GENERAL RISK ENVIRONMENT		
Source:	FLUVIAL		
Map Area:	HPW		
Scenario:	CURRENT		
Drawn by:	IH	Date:	Sep - 2016
Checked by:	MC	Date:	Sep - 2016
Approved by:	JM	Date:	Sep - 2016

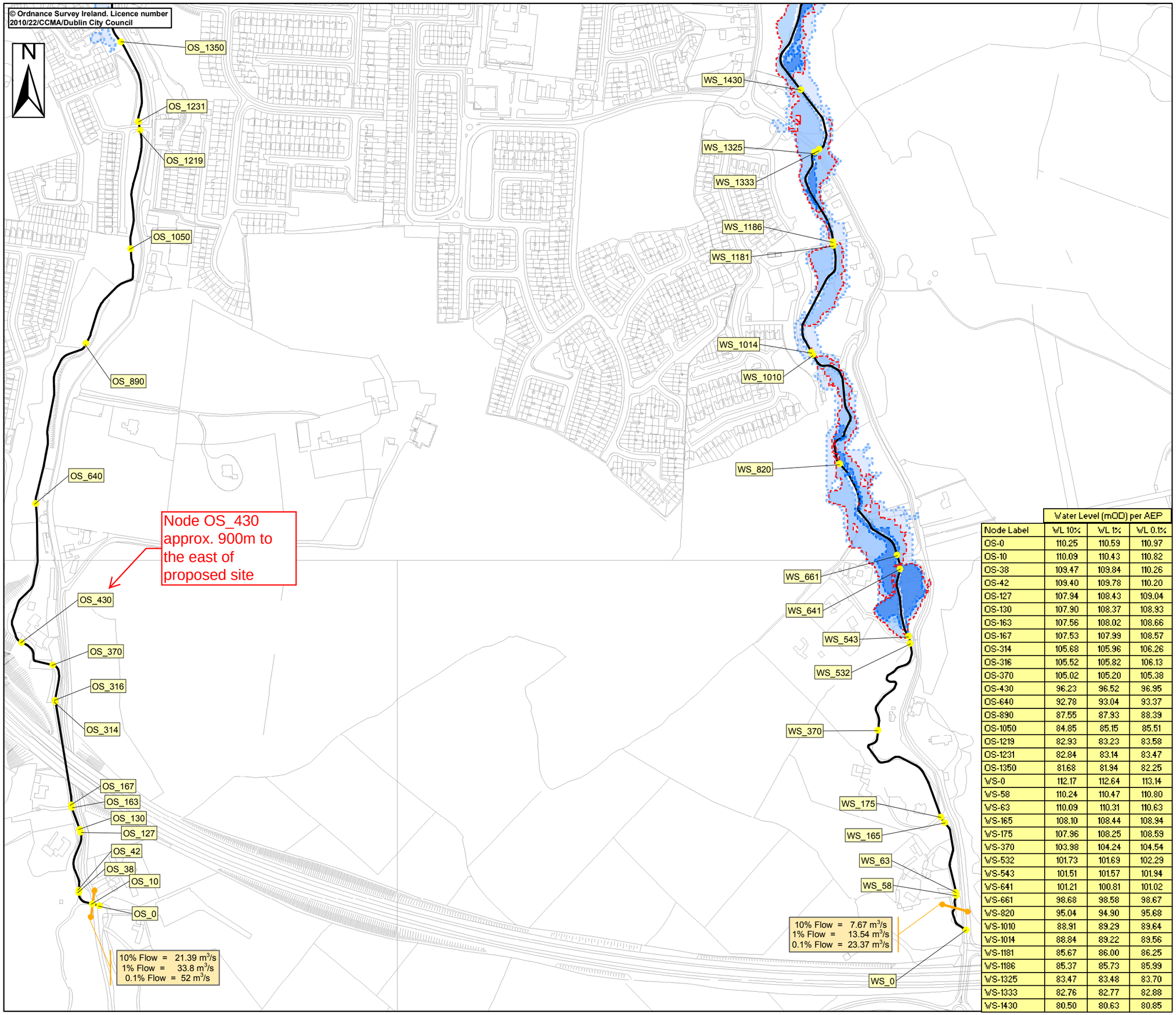
Map No.: E09DCD_RVFCD_F0_01

Revision: F0

Map Scale: 1:50,000 Plot Scale: 1:1 @ A3

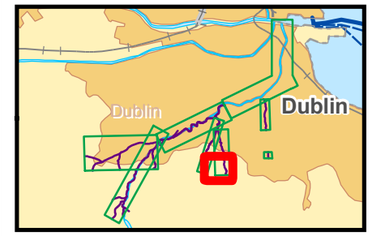
© Ordnance Survey Ireland. All rights reserved. Licence No. EN 0021016

© Ordnance Survey Ireland. Licence number 2010/22/CCMA/Dublin City Council



	Water Level (mOD) per AEP		
Node Label	WL 10%	WL 1%	WL 0.1%
OS-0	110.25	110.59	110.97
OS-10	110.09	110.43	110.82
OS-38	109.47	109.84	110.26
OS-42	109.40	109.78	110.20
OS-127	107.94	108.43	109.04
OS-130	107.90	108.37	108.93
OS-163	107.56	108.02	108.66
OS-167	107.53	107.99	108.57
OS-314	105.68	105.96	106.26
OS-316	105.52	105.82	106.13
OS-370	105.02	105.20	105.38
OS-430	96.23	96.52	96.95
OS-640	92.78	93.04	93.37
OS-890	87.55	87.93	88.39
OS-1050	84.85	85.15	85.51
OS-1219	82.93	83.23	83.58
OS-1231	82.84	83.14	83.47
OS-1350	81.68	81.94	82.25
WS-0	112.17	112.64	113.14
WS-58	110.24	110.47	110.80
WS-63	110.09	110.31	110.63
WS-165	108.10	108.44	108.94
WS-175	107.96	108.25	108.59
WS-370	103.98	104.24	104.54
WS-532	101.73	101.69	102.29
WS-543	101.51	101.57	101.94
WS-641	101.21	100.81	101.02
WS-661	98.68	98.58	98.67
WS-820	95.04	94.90	95.68
WS-1010	88.91	89.29	89.64
WS-1014	88.84	89.22	89.56
WS-1181	85.67	86.00	86.25
WS-1186	85.37	85.73	85.99
WS-1325	83.47	83.48	83.70
WS-1333	82.76	82.77	82.88
WS-1430	80.50	80.63	80.85

Location Plan:



Legend:

- 10 % AEP Flood Extent (1 in 10 chance in any given year)
- 1 % AEP Flood Extent (1 in 100 chance in any given year)
- 0.1 % AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- High Confidence (<20m) (10% AEP)
- Medium Confidence (<40m) (10% AEP)
- Low Confidence (>40m) (10% and 0.1% AEP)
- High Confidence (<20m) (1% AEP)
- Medium Confidence (<40m) (1% AEP)
- Low Confidence (>40m) (1% AEP)
- River Centreline
- Node Point
- OS_2975 — Node Label (refer to table)
- Flow reporting location
- 10% Flow = 1.20, 1% Flow = 1.56, 0.1% Flow = 2.17 — Peak flow during design flood extent

USER NOTE:

USERS OF THESE MAPS SHOULD REFER TO THE DETAILED DESCRIPTION OF THEIR DERIVATION, LIMITATIONS IN ACCURACY AND GUIDANCE AND CONDITIONS OF USE PROVIDED AT THE FRONT OF THIS BOUND VOLUME. IF THIS MAP DOES NOT FORM PART OF BOUND VOLUME, IT SHOULD NOT BE USED FOR ANY PURPOSE.

Client:

Dublin City Baile Átha Cliath · South Dublin County Council · Dún Laoghaire-Rathdown County Council Comhairle Contae Dhún Laoghaire-Ráth an Dúin · OPW

Project:

DODDER CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT STUDY

Map:

PRESENT DAY OWENDOHER & WHITECHURCH

Map Type: FLOOD EXTENT

Source: FLUVIAL FLOODING

Map Area: URBAN AREA

Scenario: CURRENT

Drawn By : A.A.B **Date :** 26 November 2010

Checked By : A.J. **Date :** 26 November 2010

Approved By : A.G.B **Date :** 26 November 2010

Figure No. :

OSWS/EXT/UA/CURS/103

Map Series : Page 1 of 3

Drawing Scale : 1: 5,000 **Plot Scale : 1:1 @ A3**

0 0.1 0.2 Kilometers

RPS Consulting Engineers
ELMWOOD HOUSE
74 BOUCHER ROAD
BELFAST BT12 6RZ
TEL : 028 9066 7914
FAX : 028 9066 8286
www.rpsgroup.com/Ireland

OPW National Flood Hazard Mapping

Summary Local Area Report

This Flood Report summarises all flood events within 2.5 kilometres of the map centre.

The map centre is in:

County: Dublin

NGR: O 123 257

This Flood Report has been downloaded from the Web site www.floodmaps.ie. The users should take account of the restrictions and limitations relating to the content and use of this Web site that are explained in the Disclaimer box when entering the site. It is a condition of use of the Web site that you accept the User Declaration and the Disclaimer.



Map Scale 1:20,842

Map Legend	
	Flood Points
	Multiple / Recurring Flood Points
	Areas Flooded
	Hydrometric Stations
	Rivers
	Lakes
	River Catchment Areas
	Land Commission *
	Drainage Districts *
	Benefiting Lands *

* Important: These maps do not indicate flood hazard or flood extent. Thier purpose and scope is explained in the Glossary.

13 Results

1. Dodder Avonmore Park Nov 2000
County: Dublin
Start Date: 05/Nov/2000
Flood Quality Code:3
Additional Information: Reports (1) More Mapped Information

2. Dodder Mount Carmel Park recurring
County: Dublin
Start Date:
Flood Quality Code:4
Additional Information: Reports (1) Press Archive (1) More Mapped Information

3. Flooding at Homeville, Knocklyon, Dublin 16.on 24th Oct 2011
County: Dublin
Start Date: 24/Oct/2011
Flood Quality Code:2
Additional Information: Reports (1) More Mapped Information

4. Flooding at Castlefield, Glenvara and Glenlyon, Knocklyon, Dublin 16.on 24th Oct 2011
County: Dublin
Start Date: 24/Oct/2011
Flood Quality Code:2
Additional Information: Reports (1) More Mapped Information

5. Grange River Tibradden Lane June 2003
County: Dublin
Start Date: 30/Jun/2003
Flood Quality Code:4

Additional Information: Reports (2) More Mapped Information

---

6. Mount Carmel Park Firhouse Nov 2000 — Start Date: 05/Nov/2000
County: Dublin — Flood Quality Code: 3

Additional Information: Reports (1) Press Archive (1) More Mapped Information

---

7. Owenadoher Edmondstown Road. Nov 2000 — Start Date: 05/Nov/2000
County: Dublin — Flood Quality Code: 3

Additional Information: Reports (2) More Mapped Information

---

8. Knocklyon Ave Nov 2000 — Start Date: 05/Nov/2000
County: Dublin — Flood Quality Code: 3

Additional Information: Reports (1) More Mapped Information

---

9. Old City water Course Spawell House Feb 1994 — Start Date: 03/Feb/1994
County: Dublin — Flood Quality Code: 3

Additional Information: Reports (1) More Mapped Information

---

10. Whitechurch Court Feb 1994 — Start Date: 03/Feb/1994
County: Dublin — Flood Quality Code: 3

Additional Information: Reports (1) More Mapped Information

---

11. Boden Villas Feb 1994 — Start Date: 03/Feb/1994
County: Dublin — Flood Quality Code: 3

Additional Information: Reports (1) More Mapped Information

---

12. Ballyboden Road Whitecliff Recurring — Start Date:
County: Dublin — Flood Quality Code: 3

Additional Information: Reports (1) More Mapped Information

---

13. Grange Stream Tibradden Lane Mutton Lane Recurring — Start Date:
County: Dublin — Flood Quality Code: 4

Additional Information: Reports (2) More Mapped Information

APPENDIX 10-B
CORRESPONDANCE WITH IRISH WATER

Gary Talbot
48 Fitswilliam Square
Dublin 2
D02EF89

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

26 March 2020

Dear Gary Talbot,

Re: Connection Reference No CDS19008724 pre-connection enquiry -
Subject to contract | Contract denied

Connection for Multi/Mixed Use Development of 400 unit(s) at Stocking Avenue, Woodtown, Dublin.

Irish Water has reviewed your pre-connection enquiry in relation to a water connection at Stocking Avenue, Woodtown, Dublin.

Based upon the details that you have provided with your pre-connection enquiry and on the capacity currently available in the network(s), as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place, your proposed connection to the Irish Water network(s) can be facilitated.

Water

New connection to the existing network is feasible without upgrade

Wastewater

In order to accommodate the proposed connection at the Premises, upgrade works are required to the Irish Water network. There is currently a project underway (Ballycullen / Oldcourt LNRP) which will provide the necessary upgrade and capacity. This upgrade project is scheduled to be completed by Q4 2021 (this may be subject to change) and the proposed connection could be completed as soon as possibly practicable after this date.

Strategic Housing Development

Irish Water notes that the scale of this development dictates that it is subject to the Strategic Housing Development planning process. In advance of submitting your full application to An Bord Pleanala for assessment, you must have reviewed this development with Irish Water and received a Statement of Design Acceptance in relation to the layout of water and wastewater services.

All infrastructure should be designed and installed in accordance with the Irish Water Codes of Practice and Standard Details. A design proposal for the water and/or wastewater infrastructure should be submitted to Irish Water for assessment. Prior to submitting your planning application, you are required to submit these detailed design proposals to Irish Water for review.

You are advised that this correspondence does not constitute an offer in whole or in part to provide a connection to any Irish Water infrastructure and is provided subject to a connection agreement being signed at a later date.

Stiúrthóirí / Directors: Cathal Marley (Chairman), Niall Gleeson, Eamon Gallen, Yvonne Harris, Brendan Murphy, Maria O'Dwyer
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin 1, D01 NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Irish Water is a designated activity company, limited by shares.
Uimhir Chláraithe in Éirinn / Registered in Ireland No.: 530363

Gary Talbot
48 Fitswilliam Square
Dublin 2
D02EF89

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

5 February 2021

Re: Design Submission for Stocking Avenue, Woodtown, Dublin (the "Development") (the "Design Submission") / Connection Reference No: CDS19008724

Dear Gary Talbot,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Irish Water has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before you can connect to our network you must sign a connection agreement with Irish Water. This can be applied for by completing the connection application form at www.water.ie/connections. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Irish Water's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Irish Water does not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Irish Water representative:
Name: Marko Komso
Email: mkomso@water.ie

Yours sincerely,

Yvonne Harris

Yvonne Harris
Head of Customer Operations

Stiúrthóirí / Directors: Cathal Marley (Chairman), Niall Gleeson, Eamon Gallen, Yvonne Harris, Brendan Murphy, Maria O'Dwyer
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin 1, D01 NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Irish Water is a designated activity company, limited by shares.
Uimhir Chláraithe in Éirinn / Registered in Ireland No.: 530363

IW-HP-MD
REV012

Appendix A

Document Title & Revision

- [WATERMAIN LAYOUT] 190230-DBFL-WM-SP-DR-C-1001-P01
- [COMBINED SERVICES] 190230-DBFL-CS-SP-DR-C-1001-P01
- [FOUL SEWER LONGSECTIONS] 190230-DBFL-FW-SP-DR-C-3001-P0

*For further information, visit **www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Irish Water will not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

© COPYRIGHT OF THIS DRAWING IS RESERVED BY DBFL CONSULTING ENGINEERS. NO PART SHALL BE REPRODUCED OR TRANSMITTED WITHOUT THEIR WRITTEN PERMISSION.

ON ORIGINAL

0 5 10 15 20 25 30 40 50mm

GENERAL NOTES:
1. ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE WORKS REQUIREMENTS.
2. ALL DIMENSIONS IN METRES UNLESS SPECIFIED OTHERWISE.
3. ALL CO-ORDINATES ARE TO IRISH TRANSVERSE MERCATOR.
4. ALL LEVELS ARE TO ORDNANCE DATUM (MALIN HEAD).
5. ALL TEMPORARY TRAFFIC & OPERATIONS MANAGEMENT SHALL COMPLY FULLY WITH THE WORKS REQUIREMENTS
6. THE CONTRACTOR MUST LIAISE DIRECTLY WITH LOCAL AUTHORITY DEPARTMENTS AS DIRECTED IN THE WORKS REQUIREMENTS.
7. ALL VEHICULAR & PEDESTRIAN, CYCLE & PRIVATE ACCESS ROUTES WITHIN AND SURROUNDING THE WORKS EXTENTS MUST BE MAINTAINED THROUGHOUT THE WORKS IN ACCORDANCE WITH THE CONTRACTORS APPROVED TEMPORARY TRAFFIC & OPERATIONS MANAGEMENT PLAN.

DRAWING SPECIFIC NOTES
1. ALL DRAWINGS TO BE CHECKED BY CONTRACTOR ON SITE AND ENGINEER INFORMED OF DISCREPANCIES BEFORE WORK COMMENCES.
2. CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF EXISTING DRAINAGE LEVELS & THE LOCATION OF EXISTING SERVICES ON SITE PRIOR TO COMMENCEMENT OF WORKS ON SITE.
3. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE NRA SPECIFICATION FOR ROAD WORKS UNLESS NOTED OTHERWISE.
4. MANHOLE COVER LEVELS ARE TO CONFORM WITH FINISHED ROAD AND PATH LEVELS
5. ALL SURFACE WATER DRAINAGE WORKS TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY'S CODE OF PRACTICE FOR DRAINAGE AND THE GDSDS.
6. ALL FOUL DRAINAGE WORKS TO BE IN ACCORDANCE WITH IRISH WATERS' CODE OF PRACTICE FOR WASTEWATER SUPPLY AND WASTEWATER INFRASTRUCTURE STANDARD DETAILS.
7. FOUL SEWERS TO BE CONCRETE PIPES (SPIGOT AND SOCKET JOINTS AND RUBBER RING FITTINGS COMPLYING WITH IS EN 1916) OR THERMOPLASTIC STRUCTURED WALL PIPES (COMPLYING WITH THE PROVISION OF IS EN 13476 AND WIS 4-35-01 2000) AND COMPLY WITH THE REQUIREMENTS OF THE IRISH WATER CODE OF PRACTICE
10. ALL SURFACE WATER SEWERS TO BE CLASS H CONCRETE TO EN1916 & IS 6 2004.
11. SURFACE WATER COLLECTOR DRAINS 150mm DIA.
12. FOUL HOUSE CONNECTIONS TO BE 100mm DIA.
13. THIS DRAWING IS BASED ON TOPO SURVEY BY J&L SURVEY Ltd. DATED 06/2016
14. CONTRACTOR SHALL INSPECT THE ROUTE & CONFIRM LOCATIONS OF ALL TREES, FEATURES, ENTRANCES & ASPECTS IMPACTING CONSTRUCTION OF THE WORKS
15. NOTE THAT THE CONTRACTOR AND/OR ARCHITECT ARE RESPONSIBLE FOR CONNECTIONS INTO THE BUILDING

LEGEND:

- SITE BOUNDARY
- BLUE SITE BOUNDARY
- 1:999 — PROPOSED ROAD GRADIENT
- 99.99 — EXISTING LEVELS
- 99.99 — PROPOSED LEVELS
- FFL 99.999 — FINISHED FLOOR LEVEL
- PROPOSED STORMWATER PIPE
- PROPOSED FOUL WATER PIPE
- EXISTING FOUL WATER PIPE
- EXISTING STORM WATER PIPE
- S9 CL 100.00 IL 99.00 — PROPOSED STORMWATER MANHOLE
- IC — PROPOSED STORMWATER INSPECTION CHAMBER
- F9 CL 100.00 IL 99.99 — PROPOSED FOUL WATER MANHOLE
- IC — PROPOSED FOUL WATER INSPECTION CHAMBER
- G — PROPOSED SURFACE WATER GULLY
- G — PROPOSED SURFACE WATER GULLY CONNECTED TO TREE PIT
- ExMH CL 100.00 IL 99.00 — EXISTING FOUL WATER MANHOLE
- ExMH CL 11.494 IL TBC — EXISTING STORMWATER MANHOLE
- PROPOSED ROAD
- PROPOSED PATH
- PROPOSED SHARED AREA
- PROPOSED PERMEABLE PAVING
- DETENTION BASIN
- STORMTECH ATTENUATION SYSTEM

rev	date	description	by	chkd.
P01	04-02-21	APB APPLICATION	JJB	SB

client approval: A - Approved; B - Approved with comments; C - Do not use

suitability: S0 - WORK IN PROGRESS

issue purpose: PLANNING

DBFL Consulting Engineers
Civil, Structural & Transportation Engineering
www.dbfl.ie

DUBLIN OFFICE: Ormond House, Upper Ormond Quay, Dublin 7, D07 W704
PHONE +353 1 400 4000

CORK OFFICE: Phoenix House, Monahan Road, Cork, T12 H1XY
PHONE +353 (0) 21 2024538

WATERFORD OFFICE: Suite 8b The Atrium, Maritana Gate, Canada Street, Waterford, X91 W028
PHONE +353 51 309 500

project ref.
WHITE PINES EAST ,
RATHFARNHAM, DUBLIN 14

drawing title
COMBINED SERVICES

client
ARDSTONE CAPITAL LTD

designed by	author	scale	sheet size
SB	JJB	1:500	A1

drawing no.: 190230-DBFL-CS-SP-DR-C-1001

revision: P01

LIST OF IRISH WATER WASTEWATER STANDARD DETAILS BROUGHT INTO THE CONTRACT

STD-WW-02	TYPICAL LAYOUT FOR SEWER WITHIN NEW DEVELOPMENT
STD-WW-03	DRAIN AND SERVICE CONNECTION PIPEWORK
STD-WW-04	TYPICAL SEWER/SERVICE PIPE CONNECTION
STD-WW-05	TYPICAL SERVICE LAYOUT INDICATING SEPARATION DISTANCES
STD-WW-06	RESTRICTIONS ON TREES/SHRUBS PLANTING ADJACENT TO SEWERS
STD-WW-07	TRENCH BACKFILL & BEDDING
STD-WW-08	CONCRETE BED, HAUNCH & SURROUND TO WASTEWATER PIPES
STD-WW-09	BLOCKWORK MANHOLE (<450mmØ)
STD-WW-10	PRE-CAST CONCRETE MANHOLE
STD-WW-11	IN-SITU CONCRETE MANHOLE
STD-WW-12	BACKDROP MANHOLES
STD-WW-13	PRIVATE SIDE INSPECTION CHAMBER
STD-WW-14	THRUST BLOCKS FOR RISING MAINS
STD-WW-15	SCOUR VALVE CHAMBER (FOUL RISING MAIN <200mmØ)
STD-WW-16	SLUICE VALVE DETAILS FOR RISING MAINS DUCTILE IRON (D.I) PIPE (<200mmØ)(SHEET 1 OF 2)
STD-WW-17	SLUICE VALVE DETAILS FOR RISING MAIN POLYETHYLENE (P.E) PIPE (<200mmØ)(SHEET 2 OF 2)
STD-WW-18	AIR VALVE CHAMBER (FOUL RISING MAIN <200mmØ)
STD-WW-19	DUCT CHAMBER
STD-WW-20	EMERGENCY OVERFLOW STRUCTURE
STD-WW-21	TYPICAL DITCH/STREAM CROSSING FOR GRAVITY MAIN (SHEET 1 OF 2)
STD-WW-22	TYPICAL DITCH/STREAM CROSSING FOR RISING MAIN (SHEET 2 OF 2)
STD-WW-23	TYPICAL BRIDGE CROSSING FOR RISING MAIN (SHEET 1 OF 2)
STD-WW-24	TYPICAL BRIDGE CROSSING FOR RISING MAIN (SHEET 2 OF 2)
STD-WW-25	SECURITY GATE & FENCING
STD-WW-26	INDICATIVE PUMPING STATION LAYOUT
STD-WW-27	FLOW METER CHAMBER (FOUL RISING MAIN <200mmØ)
STD-WW-28	INDICATIVE SUBMERSIBLE PUMPING STATION
STD-WW-28	A INDICATIVE PRE-CAST CONCRETE SUBMERSIBLE PUMPING STATION
STD-WW-29	RISING MAIN DISCHARGE MANHOLE
STD-WW-30	KIOSK TYPE 1 PUMPING STATION & WET KIOSK (SHEET 1 OF 2)
STD-WW-31	KIOSK TYPE 2 + 3 PUMPING STATION & WET KIOSK (SHEET 2 OF 2)
STD-WW-32	HARDSTANDING AREA PUMPING STATION (PERMEABLE & IMPERMEABLE)
STD-WW-33	LAMP BOLLARD & LAMP STANDARD
STD-WW-34	VENT STACK

ORDNANCE SURVEY IRELAND LICENCE
No EN 0017920
© ORDNANCE SURVEY IRELAND
GOVERNMENT OF IRELAND

© COPYRIGHT OF THIS DRAWING IS RESERVED BY DBFL CONSULTING ENGINEERS. NO PART SHALL BE REPRODUCED OR TRANSMITTED WITHOUT THEIR WRITTEN PERMISSION.

ON ORIGINAL

0 5 10 15 20 25 30 40 50mm

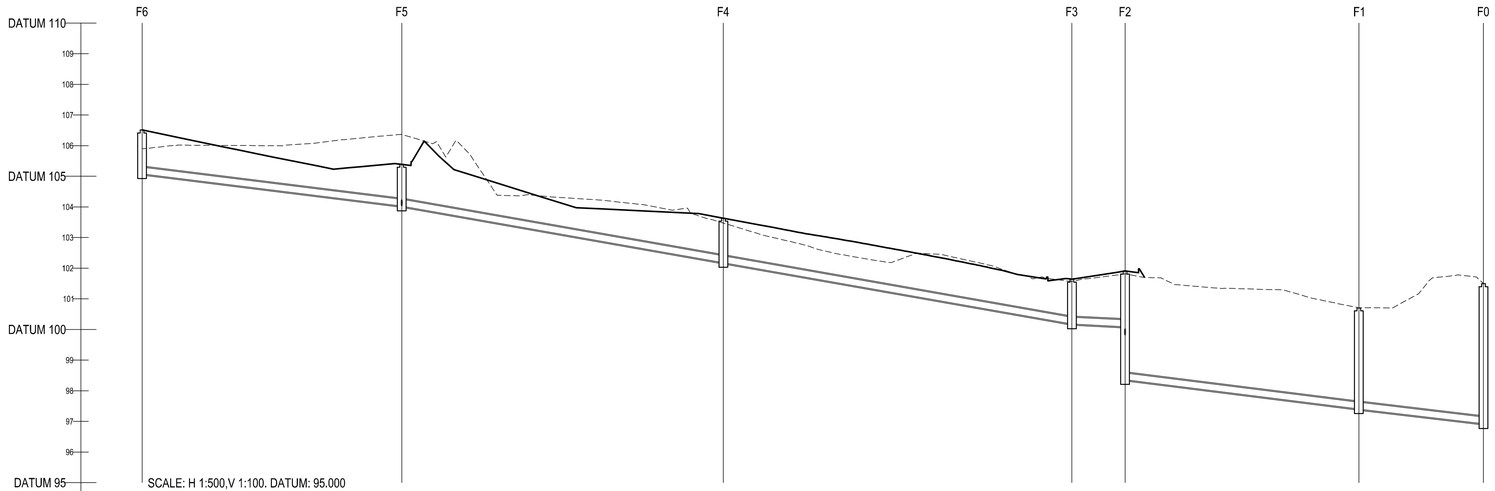
NOTES:

1. ALL DRAWINGS TO BE CHECKED BY CONTRACTOR ON SITE AND ENGINEER INFORMED OF DISCREPANCIES BEFORE WORK COMMENCES
2. ALL LEVELS ARE IN METRES AND ARE RELATED TO ORDNANCE DATUM
3. CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF PAVEMENT LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORKS ON SITE
4. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE NRA SPECIFICATION FOR ROAD WORKS UNLESS NOTED OTHERWISE
5. THIS DRAWING IS FOR PLANNING PURPOSES ONLY
6. MANHOLE COVER LEVELS ARE TO CONFORM WITH FINISHED ROAD AND PATH LEVELS
7. WHERE COVER TO PIPE IS LESS THAN 1200mm (ROAD/PATH/VERGE) OR 900mm (OPEN SPACE) SURROUND PIPE IN MINIMUM 150mm CONCRETE

KEY

EXISTING GROUND PROFILE

PROPOSED GROUND PROFILE



SCALE: H 1:500,V 1:100. DATUM: 95.000

| | | |

© COPYRIGHT OF THIS DRAWING IS RESERVED BY DBFL CONSULTING ENGINEERS. NO PART SHALL BE REPRODUCED OR TRANSMITTED WITHOUT THEIR WRITTEN PERMISSION.

ON ORIGINAL

0 5 10 15 20 25 30 40 50mm

NOTES:

GENERAL NOTES:

1. ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE WORKS REQUIREMENTS.
2. ALL DIMENSIONS IN METRES UNLESS SPECIFIED OTHERWISE.
3. ALL CO-ORDINATES ARE TO IRISH TRANSVERSE MERCATOR.
4. ALL LEVELS ARE TO ORDNANCE DATUM (MALIN HEAD).
5. ALL TEMPORARY TRAFFIC & OPERATIONS MANAGEMENT SHALL COMPLY FULLY WITH THE WORKS REQUIREMENTS
6. THE CONTRACTOR MUST LIAISE DIRECTLY WITH LOCAL AUTHORITY DEPARTMENTS AS DIRECTED IN THE WORKS REQUIREMENTS.
7. ALL VEHICULAR & PEDESTRIAN, CYCLE & PRIVATE ACCESS ROUTES WITHIN AND SURROUNDING THE WORKS EXTENTS MUST BE MAINTAINED THROUGHOUT THE WORKS IN ACCORDANCE WITH THE CONTRACTORS APPROVED TEMPORARY TRAFFIC & OPERATIONS MANAGEMENT PLAN.

DRAWING SPECIFIC NOTES

1. WATERMAIN INSTALLATION AND ALL WATER SUPPLY WORKS TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF IRISH WATER'S CODE OF PRACTICE FOR WATER SUPPLY AND WATER INFRASTRUCTURE STANDARD DETAILS
2. WATERMAIN (AND SERVICE CONNECTIONS) TO BE PE-100 SDR 17 AND CONFORM TO IS EN 12201 (PART 1, PART 2 & PART 3)
3. AT 90 DEG. TURNS USE 2 No. 45 DEG. BENDS.
4. COVER TO WATERMAIN TO BE 900mm.
5. CONNECTION BETWEEN EXISTING AND PROPOSED WATERMAINS TO BE CARRIED OUT IN ACCORDANCE WITH IRISH WATER STANDARD DETAILS STD-W-03 TO STD-W-10.
6. ANCHOR BLOCKS TO BE POSITIONED AT DEAD ENDS, TEES, BENDS AND AT EACH SIDE OF HYDRANTS AND VALVES IN ACCORDANCE WITH THE REQUIREMENTS OF IRISH WATER STANDARD DETAIL STD-W-28 (WATER MAIN THRUST AND SUPPORT BLOCKS.
7. HYDRANT OUTLET TO BE 200mm BELOW GROUND LEVEL UNLESS REQUESTED OTHERWISE.
8. WHERE COVER TO PIPE IS LESS THAN 900mm IN GREEN AREAS AND 1200mm IN TRAFFICKED AREAS, ENCASE PIPE IN NEW 150mm CONCRETE WITH MOVEMENT JOINTS.
9. NOTE THAT THE CONTRACTOR IS RESPONSIBLE FOR CONNECTIONS INTO THE BUILDING.
10. CONNECTION TO INDIVIDUAL HOUSES IN ACCORDANCE WITH IRISH WATER STD-W-03 (I.E. 25mm OD PE PIPE).
11. CONTRACTOR SHALL SATISFY THEMSELVES AS TO THE ACCURACY OF EXISTING SERVICES INFORMATION AND THE LOCATION OF EXISTING SERVICES ON SITE PRIOR TO COMMENCING INSTALLATION OF WATERMAINS.
12. INSTALLATION OF SLUICE VALVES AND HYDRANTS SHALL BE IN ACCORDANCE WITH IRISH WATER'S STANDARD DETAILS STD-W-14 TO STD-W-19.
13. HYDRANT AND WASH OUT HYDRANT RISER PIPES TO BE DN80(DOUBLE FLANGED DUCTILE IRON).
14. MARKER POSTS AND PLATES ARE TO BE PROVIDED IN ACCORDANCE WITH IRISH WATER STANDARD DETAIL STD-W-27.
15. CONNECTION TO EXISTING WATERMAINS TO BE COORDINATED BY THE CONTRACTOR WITH IRISH WATER AND/OR THE LOCAL AUTHORITY.
16. CONTRACTOR TO LIASE WITH IRISH WATER AND / OR THE LOCAL AUTHORITY AS REQUIRED REGARDING CLEANSING AND STERILISATION OF WATERMAINS

LEGEND:

- SITE BOUNDARY
- LANDS UNDER APPLICANTS OWNERSHIP
- WATERMAIN / SV — EXISTING WATERMAIN
- SV — SLUICE VALVE AS PER IRISH WATER STD-WW-15
- H — HYDRANT AS PER IRISH WATER STD-WW-18
- 150ømm WATERMAIN — WATERMAIN
- 100ømm WATERMAIN — WATERMAIN
- AV — AIR VALVE AS PER IRISH WATER STD-WW-20/22
- M — WATER METER AS PER IRISH WATER STD-WW-26
- K — WATER KIOSK
- WOH — WASHOUT HYDRANT AS PER I.W. STD-W-30A
- ScV — SCOUR VALVE AS PER I.W. STD-W-30
- B — BOUNDARY BOX

ORDNANCE SURVEY IRELAND LICENCE
No EN 0017920
© ORDNANCE SURVEY IRELAND
GOVERNMENT OF IRELAND

rev	date	description	by	chkd.
P01	04-02-21	ABP APPLICATION	JJB	SB

client approval: A - Approved; B - Approved with comments; C - Do not use

suitability: S0 - WORK IN PROGRESS

issue purpose: PLANNING

DBFL Consulting Engineers
Civil, Structural & Transportation Engineering
www.dbfl.ie

DUBLIN OFFICE: Ormond House, Upper Ormond Quay, Dublin 7, D07 W704
PHONE +353 1 400 4000

CORK OFFICE: Phoenix House, Monahan Road, Cork, T12 H1XY
PHONE +353 (0) 21 2324338

WATERFORD OFFICE: Suite 8b The Atrium, Maritana Gate, Canada Street, Waterford, X91 W028
PHONE +353 51 309 500

project ref.

WHITE PINES EAST ,
RATHFARNHAM, DUBLIN 14

drawing title

WATERMAIN LAYOUT

client

ARDSTONE CAPITAL LTD

designed by	author	scale	sheet size
BK	DJR	1:500	A1

drawing no.: 190230-DBFL-WM-SP-DR-C-1001

revision: P01

11.0 AIR QUALITY & CLIMATE

11.1 Introduction

This chapter assesses the likely air quality and climate impacts, if any, associated with the proposed White Pines East strategic housing development at Stocking Avenue, Co. Dublin. The proposed residential development will comprise the construction of No. 4 residential blocks on a site of c.2.98 hectares. The development site is located at Stocking Avenue, Ballycullen, Co. Dublin.

This chapter has been prepared with regard to the following guidelines:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018)
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – Draft (EPA, 2017);

11.2 Methodology

11.2.1 Relevant Guidelines/Agreements /Standards and Background Information

11.2.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Table 11.1 and Appendix 11.1).

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporate EU Directive 2008/50/EC, which has set limit values for NO_2, PM_{10}, $PM_{2.5}$, benzene and CO, which are applicable in relation to this project (see Table 11.1). Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions (see Appendix 11.2).

Pollutant	Regulation [Note 1]	Limit Type	Value
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m^3 NO_2
		Annual limit for protection of human health	40 µg/m^3 NO_2
		Critical limit 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 PM_{10}
		Annual limit for protection of human health	40 µg/m^3 PM_{10}
$PM_{2.5}$	2008/50/EC	Annual limit for protection of human health	25 µg/m^3 $PM_{2.5}$
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)
Dust Deposition (Non – Hazardous Dust)	TA – Luft as interpreted by DOEHLG (2004)	Average daily dust deposition at the boundary of the site	350 mg/(m^2*day)

Table 11.1: Air Quality Standards Regulations

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

11.2.1.2 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 11.1 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.

11.2.1.3 Climate Agreements

Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) in April 1994 and the Kyoto Protocol in principle in 1997 and formally in May 2002 (UNFCCC, 1997; UNFCCC, 1999). For the purposes of the EU burden sharing agreement under Article 4 of the Doha Amendment to the Kyoto Protocol, in December 2012, Ireland agreed to limit the net growth of the six Greenhouse Gases (GHGs) under the Kyoto Protocol to 20% below the 2005 level over the period 2013 to 2020 (UNFCCC, 2012). The UNFCCC is continuing detailed negotiations in relation to GHGs reductions and in relation to technical issues such as Emission Trading and burden sharing. The most recent Conference of the Parties to the Convention (COP25) took place in Madrid, Spain from the 2nd to the 13th of December 2019 and focussed on advancing the implementation of the Paris Agreement. The Paris Agreement was established at COP21 in Paris in 2015 and is an important milestone in terms of international climate change agreements. The Paris Agreement was agreed by over 200 nations and has a stated aim of limiting global temperature 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 gigatons as soon as possible whilst acknowledging that peaking of GHG emissions will take longer for developing countries. Contributions to greenhouse gas emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant progress was also made on elevating adaption onto the same level as action to cut and curb emissions.

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

The Climate Action and Low Carbon Development Act 2015 (Government of Ireland, 2015) was developed to provide for the approval of plans by the government in relation to climate change and to enable achievement of the national transition objective of achieving decarbonisation by 2050. Under this Act the National Mitigation Plan (DCCAE, 2017) and the National Adaptation Framework (DCCAE, 2018) were established. The National Mitigation Plan sets out objectives for achieving a reduction in GHG emissions and transitioning the four key sectors (power generation, built environment, transport and agriculture) to decarbonisation, while the National Adaptation Framework aims to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts. With the implementation of the Climate Action and Low Carbon Development Act 2015 Ireland has implemented a number of strategies to reduce GHG emissions in future years, with a number of other strategies currently being proposed. As a result of this, moving forward, GHG emissions should be lowered in future years, reducing impacts on climate.

11.2.1.4 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). Data available from the EU in 2010 indicated that Ireland complied with the emissions ceilings for SO2, VOCs and NH_3 but failed to comply with the ceiling for NO_X (EEA, 2012). 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 $PM_{2.5}$.

11.2.1.5 Climate Action Plan

Climate Change adaptation is a prominent feature in the South Dublin County Council Climate Action Plan 2019 – 2024 (South Dublin County Council, Codema 2019). 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.

South Dublin County Council are concentrating on two approaches required to tackle climate change. The first, mitigation, which consists od actions that will reduce GHG emissions by:

- Developing public transport routes;
- Increasing public bike facilities;
- Energy master-planning;
- Building retrofits with energy performance guarantees.

The second approach, adaptation, consists of actions that will reduce impacts that are already happening and to build a climate resilience. Building climate resilience is important as the increase in extreme weather events is predicted as a result of climate change. Some adaptation measures currently being implemented by South Dublin County Council are:

- Floor resilient urban designs;
- Emergency Response;
- Invasive species removal
- Nature restoration & planning.

Both of these approaches will enable South Dublin County Council to combat climate change in real time and also help reduce its impacts in the future.

11.2.1.6 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.

Increased traffic emissions associated with site vehicles and HGVs can also impact air quality during construction. The traffic data for the construction phase of the development has been reviewed in line with the DMRB assessment criteria outlined below. The UK DMRB guidance (UK Highways Agency, 2007; 2019) states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment:

- 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.

None of the road links impacted by the proposed development during construction meet the above criteria and therefore can be scoped out of a detailed air quality assessment. Cumulative impacts due to the White Pines East and White Pines Central proposed developments are also scoped out as they have been included within the traffic assessment during the construction phase.

11.2.1.7 Local Air Quality Assessment – Impact from Road Traffic (DMRB Assessment)

Operational phase traffic has the potential to impact air quality. The air quality assessment has been carried out following procedures described in the publications by the EPA (2015; 2017) and using the methodology outlined in the guidance documents published by the UK Highways Agency (2019a) and UK Department of Environment Food and Rural Affairs (DEFRA) (2016; 2018). Transport Infrastructure Ireland (TII) 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.

Traffic flow information was obtained on 14/12/2020 from DBFL Consulting Engineering, the traffic engineers on this project. The UK Highways Agency guidance *LA 150* (2019a) scoping criteria outlined in Section 11.2.1.6 was used to determine the road links required for inclusion in the modelling assessment (See Table 11.2). As none of the local road links impacted by the proposed development met the scoping criteria a detailed assessment was scoped out as there is no potential for significant impacts to air quality. As shown in Table 11.2, the greatest impact is a change of 450 AADT or 4% change.

Road Name	Speed (kph)	% HGV	Base	Do Nothing	Do Something	Do Nothing	Do Something
			2020	2027		2037	
Stocking Avenue East R115	50	0.27%	6,900	8,250	8,400	9,750	10,150
Stocking Wood Health R115	50	0.27%	6,850	8,000	8,100	9,500	9,800

Table 11.2: Traffic Data used in the Air Modelling Assessment

11.2.1.8 Climatic Factors / Regional Emissions

The UK Highways Agency has published an updated DMRB guidance document in relation to climate impact assessments *LA 114 Climate* (UK Highways Agency 2019b). The following scoping criteria are used to determine whether a detailed climate assessment is required for a proposed project during the operational stage. If any of the road links impacted by the proposed development meet or exceed 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.

The greatest change was 4% in AADT (Table 11.2), therefore none of the road links impacted by the proposed development meet the scoping criteria above and therefore a detailed assessment has been scoped out as there is no potential for significant impacts to climate.

11.2.1.9 Ecological Assessment

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 200m of a road and when significant changes in AADT (>5%) occur. Only sites that are sensitive to nitrogen deposition should be included in the assessment.

TII's *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (2009) and *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities* (DEHLG, 2010) provide details regarding the legal protection of designated conservation areas.

If both of the following assessment criteria are met, an assessment of the potential for impact due to nitrogen deposition shall 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 of the road links impacted by the proposed development and therefore this assessment is not required.

11.3 Receiving Environment (Baseline Situation)

11.3.1 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) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to 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 10 km north-west of the site. Casement Aerodrome meteorological data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 11.2). For data collated during five representative years (2015 – 2019), the predominant wind direction is westerly to south-westerly with a mean wind speed of 5.5 m/s over the period 2005 – 2019 (Met Eireann, 2020).

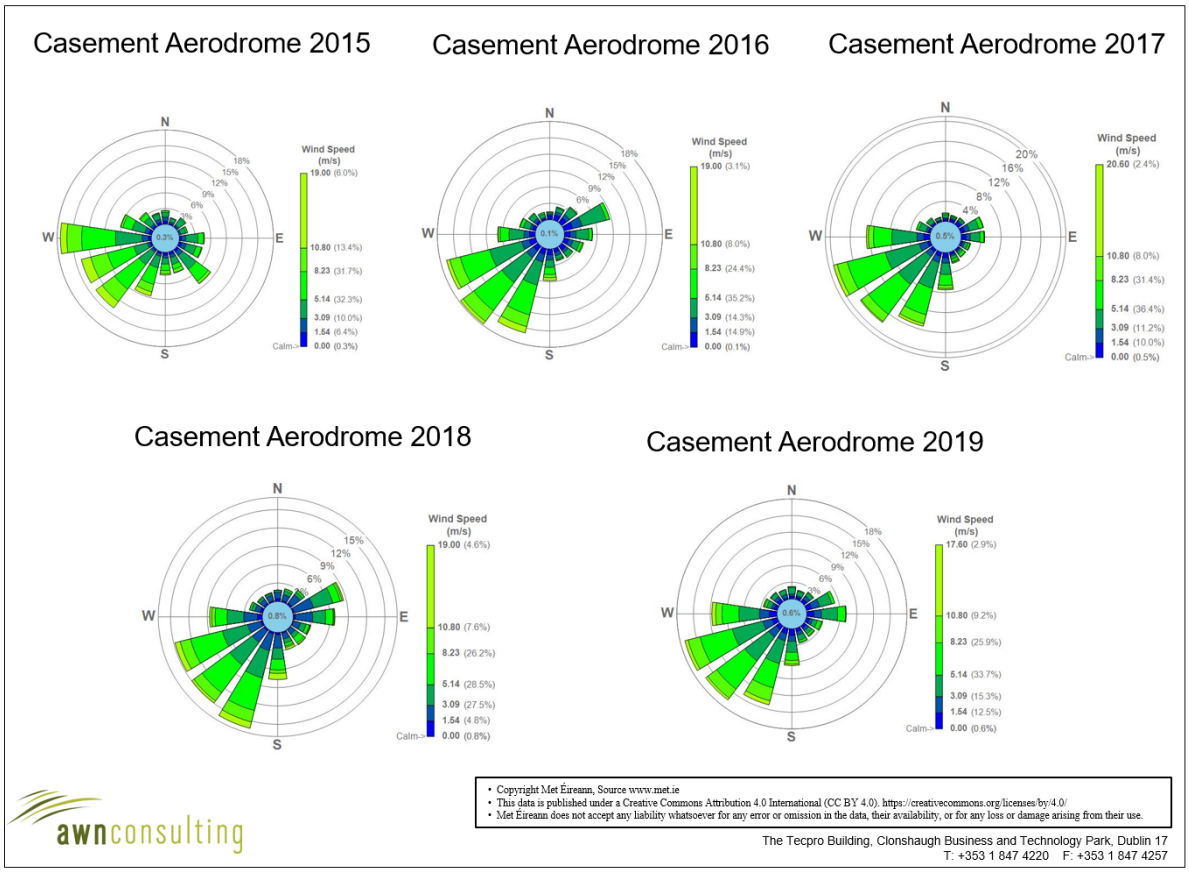


Figure 11.2: Casement Aerodrome Windrose (2015 – 2019)

11.3.2 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}, NO_2 and benzene. In addition, two of 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.

11.3.3 Baseline Air Quality – Review of Available Background Data

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is "*Air Quality in Ireland 2019*" (EPA, 2020a). 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, 2020b). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the proposed development site is within Zone A (EPA, 2020). 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, 2020a), at suburban (non-roadside) Zone A locations show that current levels of NO_2 are below both the annual and 1-hour limit values, with annual average levels ranging from 15 – 22 µg/m^3 in 2019 (see Table 11.3). Sufficient data is available for the stations in Ballyfermot, Dún Laoghaire and Swords to observe the long-term trend since 2015 (EPA, 2020a) (see Table 11.3), with results ranging from 13 – 22 µg/m^3 and few exceedances of the one-hour limit value and with an average annual mean for Rathmines for this period (2015 - 2019) of 19 µg/m^3. Based on these results, a conservative estimate of the background NO_2 concentration in the region of the proposed development is 19 µg/m^3.

Year	Rathmines	Dún Laoghaire	Swords	Ballyfermot
2015	18	16	13	16
2016	20	19	16	17
2017	17	17	14	17
2018	20	19	16	17
2019	22	15	15	20
Average	**19**	**17**	**15**	**18**

Table 11.3*:* Annual Mean NO_2 Concentrations in Zone A Locations (2014-2018) (µg/m^3***)***

Note 1 Annual average limit value - 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Continuous PM_{10} monitoring was carried out at four Zone A locations from 2015 - 2019, Rathmines, Dún Laoghaire, Tallaght and Phoenix Park. These showed an upper average limit of no more than 15 µg/m^3 (Table 11.3). Levels range from 9 - 15 µg/m^3 over the five-year period with at most 9 exceedances (in Rathmines) of the 24-hour limit value of 50 µg/m^3 in 2018 (35 exceedances are permitted per year) (EPA, 2020a). Based on the EPA data, a

conservative estimate of the current background PM_{10} concentration in the region of the proposed development is 15 µg/m^3.

Year	Rathmines	Dún Laoghaire	Tallaght	Phoenix Park
2015	15	13	14	12
2016	15	13	14	11
2017	13	12	12	9
2018	15	13	15	11
2019	15	12	12	11
Average	**14.7**	**12.6**	**13.8**	**10.7**

Table 11.4: Annual Mean PM_{10} Concentrations in Zone A Locations (2014 - 2018) (µg/m^3)
Note 1 Annual average limit value - 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Average $PM_{2.5}$ levels in Rathmines over the period 2015 – 2019 ranged from 9 - 10 µg/m^3, with a $PM_{2.5}/PM_{10}$ ratio ranging from 0.60 – 0.68 (EPA, 2020a). Based on this information, a conservative ratio of 0.7 was used to generate an existing $PM_{2.5}$ concentration in the region of the development of 10.5 µg/m^3.

11.3.4 Climatic 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 2017 (EPA, 2019c). Agriculture was the largest contributor in 2017 at 33.3% of the total, with the transport sector accounting for 19.8% of emissions of CO_2 (EPA, 2019a).

2017 is the fifth year where compliance with the European Union's Effort Sharing Decision "EU 2020 Strategy" (Decision 406/2009/EC) was assessed. Ireland had total GHG emissions of 60.74 Mt CO_2eq in 2017. This is 2.94 Mt CO_2eq higher than Ireland's annual target for emissions in 2017 (EPA, 2019a). Emissions are predicted to continue to exceed the targets in future years, therefore, reduction measures are required in all sectors.

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).

The South Dublin City Council Climate Change Action Plan published in 2019 (Dublin City Council and Codema, 2019) outlines a number of goals and plans to prepare for and adapt to climate change. There are five key action areas within the plan: energy and buildings, transport, flood resilience, nature-based solutions and resource management. Some of the

measures promoted within the Action Plan under the 5 key areas involve building retrofits, energy master-planning, development of segregated cycle routes, the promotion of bike share schemes, development of flood resilient designs, and promotion of the use of green infrastructure and water conservation initiatives. The implementation of these measures will enable the Local Authorities area to adapt to climate change and will assist in bringing Ireland closer to achieving its climate related targets in future years. New developments need to be cognisant of the Action Plan and incorporate climate friendly designs and measures where possible.

11.3.5 Sensitivity of the Receiving Environment

In line with the IAQM guidance document (2014) prior to assessing the impact of dust from a proposed development the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity.

In terns of receptor sensitivity to dust soiling, there is a residential development bordering the west of the site. As such there are between 10 – 100 high sensitivity receptors within 20m of the proposed works. Based on the IAQM criteria outlined in Table 11.5, the worst case sensitivity of the area to dust soiling is considered to be **medium.**

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	**<50**	**<100**	**<350**
High	>100	High	High	Medium	Low
	10-100	**High**	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 11.5: Sensitivity of the Area to Dust Soiling Effects on People and Property.

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM_{10} concentration, receptor sensitivity based on type and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the proposed development is estimated to be 15 µg/m^3 and there are between 10 – 100 high sensitivity receptors located within 20m of the proposed works. Based on the IAQM criteria outlined in Table11.6, the worst case sensitivity of the area to human health impacts is considered **low**.

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number Of Receptors	Distance from source (m)			
			<20	<50	<100	<200
High	< 24 µg/m^3	>100	Medium	Low	Low	Low
		10-100	**Low**	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	< 24 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	< 24 µg/m^3	>1	Low	Low	Low	Low

Table 11.6: Sensitivity of the Area to Human Health Impacts.

11.4 Predicted Impact of the Proposed Development

11.4.1 Construction Phase

11.4.1.1 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. While there are between 10 – 100 sensitive receptors less that 20 meteres from the proposed development, the predicted impacts on human health are **low** (Table 11.6).The proposed development can be considered moderate in scale and therefore there is the potential for significant dust soiling 50m from the source (TII 2011) (Table 11.7). While construction dust tends to be deposited within 200m of a construction site, the majority of the deposition occurs within the first 50m. There are two sensitive residential receptors in close proximity to the site. In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of a dust minimisation plan. Provided the dust minimisation measures outlined in the plan (see Appendix 11.3) are adhered to, the air quality impacts during the construction phase will be short-term and not significant.

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 11.7: Assessment Criteria for the Impact of Dust from Construction, with Standard Mitigation in Place

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 (See section 1.1 of *Guidance for the Treatment of Air Quality During the Planning and Construction of National Road Schemes, 2011)* 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 a negative, imperceptible and short-term impact on air quality.

11.4.1.2 Air Quality and 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. Therefore, the air quality impact of construction of the proposed development will be short-term and imperceptible with respect to human health.

11.4.1.3 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. However, based on the scale and nature of the works and the duration of construction, the impact of the construction phase on climate is considered to be short-term and imperceptible.

11.4.2 Operational Phase

11.4.2.1 Local Air Quality

There is the potential for a number of emissions to the atmosphere during the operational phase of the development. In particular, the traffic-related air emissions may generate quantities of air pollutants such as NO_2, CO, benzene, PM_{10} and $PM_{2.5}$.

Traffic flow information obtained on 14/12/2020 from DBFL Consulting Engineering, the traffic engineers on this project, was reviewed prior to assessing the impact of the proposed development. It was concluded that further assessment of impacts from the aforementioned pollutant emissions can be screened out using the UK DMRB guidance (UK Highways Agency, 2019a), on which the TII guidance was based. This guidance states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment:

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- A change in speed band;
- A change in carriageway alignment by 5m or greater.

The proposed development will not increase traffic levels by more than the above criteria (Table 11.2), therefore, an assessment of the impact of traffic emissions during the operational phase on ambient air quality is not necessary as no significant impacts are likely. It can be concluded that the impact of the proposed development in terms of air quality is long-term, localised, negative and imperceptible.

11.4.2.2 Local Air Quality Impact on Human Health

Operational traffic emissions were screened out as per the criteria discussed in Section 11.4.2.1, therefore it can be considered that emissions as a result of the proposed development are compliant with all National and EU ambient air quality limit values which are set for the protection of human health and therefore, will not result in a significant impact on human health. Impacts to human health during operation are deemed long-term, neutral and imperceptible.

11.4.2.3 Climate

The impact of the proposed development on emissions of CO_2 impacting climate were also assessed using the DMRB screening criteria as outlined in Section 11.4.2.1 (UK Highways Agency, 2019b). As with the air quality assessment impacts on climate can be screened out due to no road links being classed as impacted. Therefore, the likely overall magnitude of the changes on climate in the operational stage is imperceptible, negative and long-term.

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on site in future years. A detailed flood risk assessment has been undertaken as part of this planning application and adequate attenuation and drainage have been provided for to account for increased rainfall in future years. Therefore, the impact will be imperceptible.

11.5 Mitigation Measures

11.5.1 Construction Phase

11.5.1.1 Local Air Quality

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the dust management plan. The key aspects of controlling dust are listed below. Full details of the dust management plan can be found in Appendix 11.3 and the Preliminary Construction Management Plan, prepared by DBFL, appended to this EIAR.

- The Contractor shall prepare a dust minimisation plan which shall be communicated to all site staff;
- 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 traffic;
- Any road that has the potential to give rise to fugitive dust must be regularaly watered, as appropriate, during dry and/or windy conditions;
- 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;
- Vehicles delivering material with dust potential (soil, aggregates etc.) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- Public roads outside the site will be inspected on a daily basis for cleanliness and cleaned as necessary;
- Debris, sediment, grit etc. capeuted by road sweeping vehicles is to be disoposed off-site at a licensed facility;
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate prior to entering onto public roads;
- Material handling systems and site stockpiling of materials will be designsated 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 or and off-site, trucks will be strintgently 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, the procedures within the plan will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

Monitoring of dust deposition levels (via the Bergerhoff method) shall take place at a number of locations at the site boundary of the development to ensure dust nuisance is not occurring at nearby sensitive receptors. This monitoring aims to ensure that the dust mitigations measures are being implemented properly throughout the site.

11.5.1.2 Climate

Construction traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the proposed development. Construction vehicles, generators etc., may give rise to some CO_2 and N_2O emissions. However, based on the short-term nature and moderate scale of the works, the impact on climate will not be significant.

Nevertheless, some site-specific mitigation measures can be implemented during the construction phase of the proposed development to ensure emissions are minimised. In particular the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

11.5.2 Operational Phase

The operational phase air quality impact is considered imperceptible and therefore no site specific mitigation measures are required. In general mitigation measures in relation to traffic-derived pollutants have focused generally on improvements in both engine technology and fuel quality. EU legislation, based on the EU sponsored Auto-Oil programmes, has imposed stringent emission standards for key pollutants (Regulation (EC) No 715/2007) for passenger cars which was complied with in 2009 (Euro V) and 2014 (Euro VI). Current emission standards which took effect in 2017 are Euro 6c and Euro $6d_{temp}$.

Emissions of pollutants from road traffic can be controlled most effectively by either diverting traffic away from heavily congested areas or ensuring free flowing traffic through good traffic management plans and the use of automatic traffic control systems (UK DEFRA, 2016; 2018).

The Climate Action Plan 2019 (Government of Ireland, 2019) has outlined a number of actions to reduce the use of petrol/diesel vehicles and promote the uptake of electric vehicles in order to achieve the target of 500,000 electric vehicles on the road by 2030. The measures proposed include changes to VRT and motor tax to allow for this to be calculated based on CO_2eq, therefore higher emitting vehicles will pay increased tax rates, thus incentivising the purchase of lower emitting vehicles. VRT relief and Benefit in Kind exemptions as well as a vehicle scrappage scheme are among other measures proposed. In addition, as part of Budget 2020, it is planned to introduce a NO_X emissions levy to all passenger cars from January 2020. The levy will be charged on a NO_X mg per kilometre basis. Overall, these measures will reduce pollutant levels in future years thus improving air quality.

11.6 Residual Impacts

11.6.1 Construction Phase

As with the proposed development, the primary source of air quality impacts during the construction phase of nearby committed developments will be the potential for nuisance dust impacts. The dust minimisation measures outlined for the proposed development should be implemented throughout the construction phase for all developments in the vicinity of the site to avoid any nuisance dust impacts occurring. Once these minimisation measures are in place the impact to air quality is considered short-term and imperceptible.

11.6.2 Operational Phase

The local air quality impact assessment, regional air quality impact assessment and climate impact assessment described earlier in this section have all been based on cumulative traffic data incorporating projected traffic from existing and committed developments in the vicinity of the project site. As the outcomes of those assessments concluded that impacts will be long-term and imperceptible with respect to air quality and climate, no further residual impact assessment is required for the proposed development.

11.7 Monitoring

11.7.1 Construction Phase

Monitoring of construction dust deposition at nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure the mitigation measures are providing adequate dust minimisation. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The applicable limit value is the TA Luft limit value of 350 mg/(m^2*day) for a monitoring period of between 28 - 32 days.

11.7.2 Operational Phase

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

11.8 Difficuties Encountered

There were no difficulties encountered in preparing this Air Quality and Climate Assessment.

11.9 References

- DEHLG (2004) National Programme for Ireland under Article 6 of Directive 2001/81/EC for the Progressive Reduction of National Emissions of Transboundary Pollutants by 2010
- DEHLG (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities
- DEHLG (2007) Update and Revision of the National Programme for Ireland under Article 6 of Directive 2001/81/EC for the Progressive Reduction of National Emissions of Transboundary Pollutants by 2010
- Department of the Environment, Heritage and Local Government (2010) Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities
- Environmental Resources Management (1998) Limitation and Reduction of CO2 and Other Greenhouse Gas Emissions in Ireland
- 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 (2020a) Air Quality Monitoring Report 2019 (& previous annual reports)
- Environmental Protection Agency (2020b) EPA website Available at: http://www.epa.ie/whatwedo/monitoring/air/
- Environmental Protection Agency (2019a) Ireland's Final Greenhouse Gas Emissions 1990 – 2017
- Environmental Protection Agency (2019b) GHG Emissions Projections Report - Ireland's
- Government of Ireland (2015) Climate Action and Low Carbon Development Act Greenhouse Gas Emissions Projections 2018 - 2040
- European Council (2014) Conclusions on 2030 Climate and Energy Policy Framework, SN 79/14
- German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft
- Highways England (2013) Interim Advice Note 170/12 v3 Updated air quality advice on the assessment of future NOx and NO2 projections for users of DMRB Volume 11, Section 3, Part 1 'Air Quality
- 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 Climate Action Plan 2019 – 2024 – Final Report
- 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 (2019) NOx to NO2 Conversion Spreadsheet (Version 7.1)
- UK DEFRA (2018) Part IV of the Environment Act 1995: Local Air Quality Management, LAQM.TG(16)
- UK Department of the Environment, Transport and Roads (1998) Preparation of Environmental Statements for Planning Projects That Require Environmental Assessment - A Good Practice Guide, Appendix 8 - Air & Climate
- UK Highways Agency (2007) Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1 - HA207/07 (Document & Calculation Spreadsheet)
- UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance
- UN Framework Convention on Climate Change (1997) Kyoto Protocol To The United Nations Framework Convention On Climate Change
- UN Framework Convention on Climate Change (2012) Doha Amendment To The Kyoto Protocol
- 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)

A11.1 APPENDIX 11.1 - TRANSPORT INFRASTRUCTURE IRELAND SIGNIFICANCE CRITERIA FOR AIR QUALITY

Magnitude of Change	Annual Mean NO_2 / PM_{10}	No. days with PM_{10} concentration > 50 µg/m³	Annual Mean $PM_{2.5}$
Large	Increase / decrease ≥4 µg/m³	Increase / decrease >4 days	Increase / decrease ≥2.5 µg/m³
Medium	Increase / decrease 2 - <4 µg/m³	Increase / decrease 3 or 4 days	Increase / decrease 1.25 - <2.5 µg/m³
Small	Increase / decrease 0.4 - <2 µg/m³	Increase / decrease 1 or 2 days	Increase / decrease 0.25 - <1.25 µg/m³
Imperceptible	Increase / decrease <0.4 µg/m³	Increase / decrease <1 day	Increase / decrease <0.25 µg/m³

Table A11.1: Definition of Impact Magnitude for Changes in Ambient Pollutant Concentrations

Absolute Concentration in Relation to Objective/Limit Value	Change in Concentration Note 1		
	Small	**Medium**	**Large**
Increase with Scheme			
Above Objective/Limit Value With Scheme (≥40 µg/m³ of NO_2 or PM_{10}) (≥25 µg/m³ of $PM_{2.5}$)	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective/Limit Value With Scheme (36 - <40 µg/m3 of NO_2 or PM_{10}) (22.5 - <25 µg/m³ of $PM_{2.5}$)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value With Scheme (30 - <36 µg/m3 of NO_2 or PM_{10}) (18.75 - <22.5 µg/m³ of $PM_{2.5}$)	Negligible	Slight Adverse	Slight Adverse
Well Below Objective/Limit Value With Scheme (<30 µg/m³ of NO_2 or PM_{10}) (<18.75 µg/m³ of $PM_{2.5}$)	Negligible	Negligible	Slight Adverse
Decrease with Scheme			
Above Objective/Limit Value With Scheme (≥40 µg/m³ of NO_2 or PM_{10}) (≥25 µg/m3 of $PM_{2.5}$)	Slight Beneficial	Moderate Beneficial	Substantial Beneficial
Just Below Objective/Limit Value With Scheme (36 - <40 µg/m³ of NO_2 or PM_{10}) (22.5 - <25 µg/m³ of $PM_{2.5}$)	Slight Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value With Scheme (30 - <36 µg/m³ of NO_2 or PM_{10}) (18.75 - <22.5 µg/m³ of $PM_{2.5}$)	Negligible	Slight Beneficial	Slight Beneficial
Well Below Objective/Limit Value With Scheme (<30 µg/m³ of NO_2 or PM_{10}) (<18.75 µg/m³ of $PM_{2.5}$)	Negligible	Negligible	Slight Beneficial

Table A11.2: Air Quality Impact Significance Criteria For Annual Mean NO_2 and PM_{10} and $PM_{2.5}$ Concentrations at a Receptor

Note 1 Well Below Standard = <75% of limit value.

Absolute Concentration in Relation to Objective / Limit Value	Change in Concentration Note 1		
	Small	**Medium**	**Large**
Increase with Scheme			
Above Objective/Limit Value With Scheme (≥35 days)	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective/Limit Value With Scheme (32 - <35 days)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value With Scheme (26 - <32 days)	Negligible	Slight Adverse	Slight Adverse
Well Below Objective/Limit Value With Scheme (<26 days)	Negligible	Negligible	Slight Adverse
Decrease with Scheme			
Above Objective/Limit Value With Scheme (≥35 days)	Slight Beneficial	Moderate Beneficial	Substantial Beneficial
Just Below Objective/Limit Value With Scheme (32 - <35 days)	Slight Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value With Scheme (26 - <32 days)	Negligible	Slight Beneficial	Slight Beneficial
Well Below Objective/Limit Value With Scheme (<26 days)	Negligible	Negligible	Slight Beneficial

Table A11.3: Air Quality Impact Significance Criteria For Changes to Number of Days with PM_{10} Concentration Greater than 50 µg/m^3 at a Receptor

Note 1 Where the Impact Magnitude is Imperceptible, then the Impact Description is Negligible

A11.2 APPENDIX 11.2 - AMBIENT AIR QUALITY STANDARDS

National standards for ambient air pollutants in Ireland have generally ensued from Council Directives enacted in the EU (& previously the EC & EEC). The initial interest in ambient air pollution legislation in the EU dates from the early 1980s and was in response to the most serious pollutant problems at that time which was the issue of acid rain. As a result of this sulphur dioxide, and later nitrogen dioxide, were both the focus of EU legislation. Linked to the acid rain problem was urban smog associated with fuel burning for space heating purposes. Also apparent at this time were the problems caused by leaded petrol and EU legislation was introduced to deal with this problem in the early 1980s.

In recent years the EU has focused on defining a basis strategy across the EU in relation to ambient air quality. In 1996, a Framework Directive, Council Directive 96/62/EC, on ambient air quality assessment and management was enacted. The aims of the Directive are fourfold. Firstly, the Directive's aim is to establish objectives for ambient air quality designed to avoid harmful effects to health. Secondly, the Directive aims to assess ambient air quality on the basis of common methods and criteria throughout the EU. Additionally, it is aimed to make information on air quality available to the public via alert thresholds and fourthly, it aims to maintain air quality where it is good and improve it in other cases.

As part of these measures to improve air quality, the European Commission has adopted proposals for daughter legislation under Directive 96/62/EC. The first of these directives to be enacted, Council Directive 1999/30/EC, has been passed into Irish Law as S.I. No 271 of 2002 (Air Quality Standards Regulations 2002), and has set limit values which came into operation on 17th June 2002. The Air Quality Standards Regulations 2002 detail margins of tolerance, which are trigger levels for certain types of action in the period leading to the attainment date. The margin of tolerance varies from 60% for lead, to 30% for 24-hour limit value for PM_{10}, 40% for the hourly and annual limit value for NO_2 and 26% for hourly SO_2 limit values. The margin of tolerance commenced from June 2002, and started to reduce from 1 January 2003 and every 12 months thereafter by equal annual percentages to reach 0% by the attainment date. A second daughter directive, EU Council Directive 2000/69/EC, has published limit values for both carbon monoxide and benzene in ambient air. This has also been passed into Irish Law under the Air Quality Standards Regulations 2002.

The most recent EU Council Directive on ambient air quality was published on the 11/06/08 which has been transposed into Irish Law as S.I. 180 of 2011. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive and its subsequent daughter directives. Provisions were also made for the inclusion of new ambient limit values relating to $PM_{2.5}$. The margins of tolerance specific to each pollutant were also slightly adjusted from previous directives. In regards to existing ambient air quality standards, it is not proposed to modify the standards but to strengthen existing provisions to ensure that non-compliances are removed. In addition, new ambient standards for $PM_{2.5}$ are included in Directive 2008/50/EC. The approach for $PM_{2.5}$ was to establish a target value of 25 µg/m^3, as an annual average (to be attained everywhere by 2010) and a limit value of 25 µg/m^3, as an annual average (to be attained everywhere by 2015), coupled with a target to reduce human exposure generally to $PM_{2.5}$ between 2010 and 2020. This exposure reduction target will range from 0% (for $PM_{2.5}$ concentrations of less than 8.5 µg/m^3 to 20% of the average exposure indicator (AEI) for concentrations of between 18 - 22 µg/m^3). Where the AEI is currently greater than 22 µg/m^3 all appropriate measures should be employed to reduce this level to 18 µg/m^3 by 2020. The AEI is based on measurements taken in urban background locations

averaged over a three year period from 2008 - 2010 and again from 2018-2020. Additionally, an exposure concentration obligation of 20 µg/m^3 was set to be complied with by 2015 again based on the AEI.

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. The Alert Threshold is defined in Council Directive 96/62/EC as "a level beyond which there is a risk to human health from brief exposure and at which immediate steps shall be taken as laid down in Directive 96/62/EC". These steps include undertaking to ensure that the necessary steps are taken to inform the public (e.g. by means of radio, television and the press).

The Margin of Tolerance is defined in Council Directive 96/62/EC as a concentration which is higher than the limit value when legislation comes into force. It decreases to meet the limit value by the attainment date. The Upper Assessment Threshold is defined in Council Directive 96/62/EC as a concentration above which high quality measurement is mandatory. Data from measurement may be supplemented by information from other sources, including air quality modelling.

An annual average limit for both NO_X (NO and NO_2) is applicable for the protection of vegetation in highly rural areas away from major sources of NO_X such as large conurbations, factories and high road vehicle activity such as a dual carriageway or motorway. Annex VI of EU Directive 1999/30/EC identifies that monitoring to demonstrate compliance with the NO_X limit for the protection of vegetation should be carried out distances greater than:

- 5 km from the nearest motorway or dual carriageway
- 5 km from the nearest major industrial installation
- 20 km from a major urban conurbation

As a guideline, a monitoring station should be indicative of approximately 1000 km^2 of surrounding area.

Under the terms of EU Framework Directive on Ambient Air Quality (96/62/EC), geographical areas within member states have been classified in terms of zones. The zones have been defined in order to meet the criteria for air quality monitoring, assessment and management as described in the Framework Directive and Daughter Directives. Zone A is defined as Dublin and its environs, Zone B is defined as Cork City, Zone C is defined as 23 urban areas with a population greater than 15,000 and Zone D is defined as the remainder of the country. The Zones were defined based on among other things, population and existing ambient air quality.

EU Council Directive 96/62/EC on ambient air quality and assessment has been adopted into Irish Legislation (S.I. No. 33 of 1999). The act has designated the Environmental Protection Agency (EPA) as the competent authority responsible for the implementation of the Directive and for assessing ambient air quality in the State. Other commonly referenced ambient air quality standards include the World Health Organisation. The WHO guidelines differ from air quality standards in that they are primarily set to protect public health from the effects of air pollution. Air quality standards, however, are air quality guidelines recommended by governments, for which additional factors, such as socio-economic factors, may be considered.

Air Dispersion Modelling

The inputs to the DMRB model consist of information on road layouts, receptor locations, annual average daily traffic movements, annual average traffic speeds and background concentrations (UK DEFRA 2016). Using this input data the model predicts ambient ground level concentrations at the worst-case sensitive receptor using generic meteorological data.

The DMRB has recently undergone an extensive validation exercise (UK DEFRA 2018) as part of the UK's Review and Assessment Process to designate areas as Air Quality Management Areas (AQMAs). The validation exercise was carried out at 12 monitoring sites within the UK DEFRAs national air quality monitoring network. The validation exercise was carried out for NO_X, NO_2 and PM_{10}, and included urban background and kerbside/roadside locations, "open" and "confined" settings and a variety of geographical locations (UK DEFRA 2018).

In relation to NO_2, the model generally over-predicts concentrations, with a greater degree of over-prediction at "open" site locations. The performance of the model with respect to NO_2 mirrors that of NO_X showing that the over-prediction is due to NO_X calculations rather than the NO_X:NO_2 conversion. Within most urban situations, the model overestimates annual mean NO_2 concentrations by between 0 to 40% at confined locations and by 20 to 60% at open locations. The performance is considered comparable with that of sophisticated dispersion models when applied to situations where specific local validation corrections have not been carried out.

The model also tends to over-predict PM_{10}. Within most urban situations, the model will over-estimate annual mean PM_{10} concentrations by between 20 to 40%. The performance is comparable to more sophisticated models, which, if not validated locally, can be expected to predict concentrations within the range of $\pm$50%.

Thus, the validation exercise has confirmed that the model is a useful screening tool for the Second Stage Review and Assessment, for which a conservative approach is applicable (UK DEFRA 2018).

A11.3 APPENDIX 11.3 - DUST MINIMISATION PLAN

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the following management plan has been formulated by drawing on best practice guidance from Ireland, the UK (IAQM 2014, BRE 2003, Scottish Office 1996 and UK ODPM 2002). and the USA (USEPA 1997).

Site Management

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies.

At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 11.2 for the windrose for Casement Aerodrome). As the prevailing wind is predominantly westerly to south-westerly, locating construction compounds and storage piles downwind of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed (BRE 2003, UK ODPM 2002). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials (USEPA 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods were care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised;
- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein;

- At all times, the procedures put in place will be strictly monitored and assessed.
- The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

Site Roads / Haulage Routes

Movement of construction trucks along site roads (particularly unpaved roads) can be a significant source of fugitive dust if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK ODPM 2002).

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved site roads;
- Access gates to the site shall be located at least 10m from sensitive receptors where possible;
- Bowsers or suitable watering equipment will be available during periods of dry weather throughout the construction period. Research has found that watering can reduce dust emissions by 50% (USEPA, 1997). Watering shall be conducted during sustained dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use;
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.

Land Clearing / Earth Moving

Land clearing / earth-moving works during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust;
- During periods of very high winds (gales), activities likely to generate significant dust emissions should be postponed until the gale has subsided.

Storage Piles

The location and moisture content of storage piles are important factors which determine their potential for dust emissions.

- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles should be located downwind of sensitive receptors;

- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust. The regular watering of stockpiles has been found to have an 80% control efficiency (UK ODPM 2002);
- Where feasible, hoarding will be erected around site boundaries to reduce visual impact. This will also have an added benefit of preventing larger particles from impacting on nearby sensitive receptors.

Site Traffic on Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads should be reduced to a minimum by employing the following measures:

- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- At the main site traffic exits, a wheel wash facility shall be installed if feasible. All trucks leaving the site must pass through the wheel wash. In addition, public roads outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.

Summary of Dust Mitigation Measures

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed; and
- The specification of effective measures to deal with any complaints received.

12.0 NOISE AND VIBRATION

12.1 Introduction and Research Methodology

AWN Consulting Ltd. has been commissioned to carry out a noise and vibration impact preplanning assessment of the proposed White Pines East development at Stocking Avenue, County Dublin. This report provides a summary of the baseline environment, the relevant criteria adopted for the project, the key items to be assessed relating to noise and vibration and the methodologies to be employed.

A full description of the development can be found in Chapter 2.0 of this EIAR.

In terms of the site, noise and vibration will be considered in terms of two aspects. The first is the outward effect of the development (i.e. the potential effect of the buildings and commercial activities on existing sensitive receptors in the study area) and the inward effect of the existing noise and vibration sources on the development itself.

The study has been undertaken using the following methodology:

- Baseline noise monitoring has been undertaken at the development site location;
- 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 to estimate the likely noise and vibration emissions during the construction phases of the project at the nearest sensitive locations (NSL's) to the site;
- Predictive calculations have been performed to assess the potential effects associated with the operation of the development at the most sensitive locations surrounding the development site and inward on the development itself;
- A schedule of mitigation measures has been proposed, where relevant, to control the noise and vibration emissions associated with both the construction and operational phases of the proposed development, and;
- An initial risk assessment of the inward effect of noise in the surrounding environment into the proposed buildings has also been undertaken and the provision of outline mitigation measures has been provided to negate the impact.

Typical ambient noise levels across the local area have been measured and these are used to identify appropriate construction phase noise criteria. Proposed construction plant are also identified and expected noise output data used to predict likely noise levels at surrounding receptors. Predicted levels are assessed in the context of identified criteria, and mitigation measures, where required, are outlined.

12.2 Legislation and Guidance

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);
- *Guidelines on the Information to be contained in Environmental Impact Assessment Reports*, Draft (EPA, 2017), and;
- *Advice Notes for Preparing Environmental Impact Statements*, Draft (EPA September 2015).

12.3 Receiving Environment

The site is located in the Woodland townland, off Stocking Avenue in Dublin 16. The greenfield site is bounded by the M50 to the north and Stocking Avenue to the south. To the east and west of the site lie residential properties.

12.3.1 Receptors

The nearest existing residential noise-sensitive locations to the proposed development are those located at Green Acres House and White Pines Meadow(at White Pines Norh), which are located directly adjacent to the east and west boundaries respectively. Stocking Hill is located some 40m to the east and Ait Linn is located some 90m to the southeast of the site.

12.3.2 Desktop Study of Published Data – Current Baseline Scenario

Reference has been made to the strategic noise maps produced by the EPA as part of the Round 3 noise mapping study in accordance with the requirements of the Environmental Noise Regulations (S.I. No. 140/2006) to review published data relating to noise sources in the area.

As part of the mapping round, roads with >3 million vehicle movements and rail exceeding the flow threshold of 30,000 vehicle passages per annum are modelled and noise contours produced in terms of two noise indicators, L_{den} and L_{night}. These are defined as follows:

- L_{den} is the day-evening-night noise indicator based on year-long averages of the day (07:00-19:00), evening (19:00-23:00) and night (23:00-07:00) time periods. It is 'weighted' to account for extra annoyance in the evening and night periods.
- L_{night} is the night time noise indicator over the night-time period (23:00-07:00hrs).

As part of the noise mapping process for the Round 3 study the following roads have been modelled and mapped using traffic flow data for the year 2016:

- M50 (Road); and,
- Stocking Avenue (Road).

Figure 12.1 presents the road noise mapping for the long-term day-evening-night (L_{den}) period in the vicinity of the development site, identified in red.



Figure 12.1: Road Traffic L_{den} Noise Contours (Source epa.ie)

Reference to Figure 12.1 indicates that road traffic noise across the site is in the range of 65 to >75dB L_{den} with highest noise levels along the northern end of the development site in proximity to the M50. The lowest noise values are mapped across the remainder of the site as the distance from the M50 road source increases.

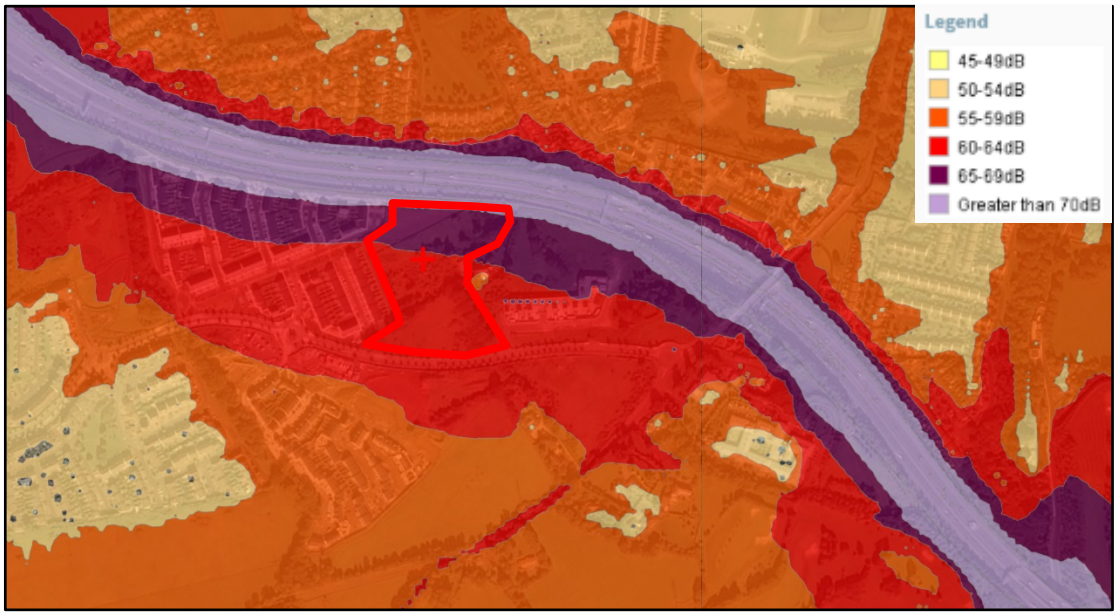


Figure 12.2: Road Traffic L_{night} Noise Contours (Source epa.ie)

Figure 12.2 presents the road traffic noise mapping for the night-time period (L_{night}) period in the vicinity of the development site, identified in red. Reference to Figure 12.2 indicates that road traffic noise across the site is in the range of 60 to 69dB L_{night}, similarly with highest noise levels along the northern end of the development site and lowest values along remainder of the site.

It is noted that the L_{night} values correlate well with the measured and predicted values across site as presented in Sections 12.3.3.4 and 12.5.5.2, respectively.

12.3.3 Environmental Noise Survey Details

Baseline noise monitoring has been undertaken at the development site to determine the noise levels and to establish the existing noise climate at the nearest noise sensitive locations and the development site itself.

The survey was conducted in general accordance with ISO1996-2:2017 Acoustics - Description, Measurement and Assessment of Environmental Noise – Part 2: Determination of Sound Pressure Levels.

The specific details the noise survey will be set out in the following sections.

12.3.3.1 Measurement Parameters

The noise survey results are presented in terms of the following parameters.

L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

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

L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

The "A" suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to 2x10-5 Pa.

12.3.3.2 Survey Equipment

The survey was undertaken using a RION NL-52 noise meter. The meter was check calibrated before and after the survey with no drift noted.

Manufacturer	Model	Serial Number
RION	NL-52	1076328

Table 12.2: Instrumentation Details

12.3.3.3 Weather Conditions

Weather conditions were generally calm with some sporadic rainfall. Elevated wind speeds were noted on the night of the 8th August 2019. Conditions were considered typical for the season and locale over the duration of the survey.

12.3.3.4 Measurement Locations and Survey Periods

One monitoring position was chosen (NM1) along the Stocking Avenue to the southeast of the site, representative of the noise climate within the proposed development site. Figure 12.3 indicates the noise monitoring location in close proximity to the proposed site.



Figure 12.3: Noise Monitoring Location

The noise environment measured is considered typical of that associated with a site near a busy roadway. Table 12.3 summarises the ambient $L_{Aeq,16hr}$ value over the daytime period (07:00 and 23:00hrs) and the $L_{Aeq,8hr}$ over the night-time (23:00 to 07:00hrs) period measured at the NM1. Noise measurements at NM1 were taken at a height of 4m above ground.

Date	Period (T)	Measured Noise Levels	
		$L_{Aeq,T}$	$L_{A90,T}$
07/08/2019	Day (07:00 – 23:00hrs)*	64	56
	Night (23:00 – 07:00hrs)	54	44
08/08/2019	Day (07:00 – 23:00hrs)	64	56
	Night (23:00 – 07:00hrs)	58	48
09/08/2019	Day (07:00 – 23:00hrs)	64	53
	Night (23:00 – 07:00hrs)	55	47
10/08/2019	Day (07:00 – 23:00hrs)	64	56
	Night (23:00 – 07:00hrs)	56	48
11/08/2019	Day (07:00 – 23:00hrs)	63	58
	Night (23:00 – 07:00hrs)	55	46
12/08/2019	Day (07:00 – 23:00hrs)	64	56
	Night (23:00 – 07:00hrs)	55	46
13/08/2019	Day (07:00 – 23:00hrs)	64	54
	Night (23:00 – 07:00hrs)	54	39
14/08/2019	Day (07:00 – 23:00hrs)	65	57
	Night (23:00 – 07:00hrs)	57	51
15/08/2019	Day (07:00 – 23:00hrs)	64	56
	Night (23:00 – 07:00hrs)	57	46
16/08/2019	Day (07:00 – 23:00hrs)*	66	59

Table 12.3: NM1 Measurement Results
*Measurements were not captured across the entire daytime periods for 7 and 16 August, hence they have not been used for assessment purposes in this report.

Figure 12.4 presents the distribution of the magnitude of L_{AFmax} events during the night period at the noise monitoring location considered for this assessment.

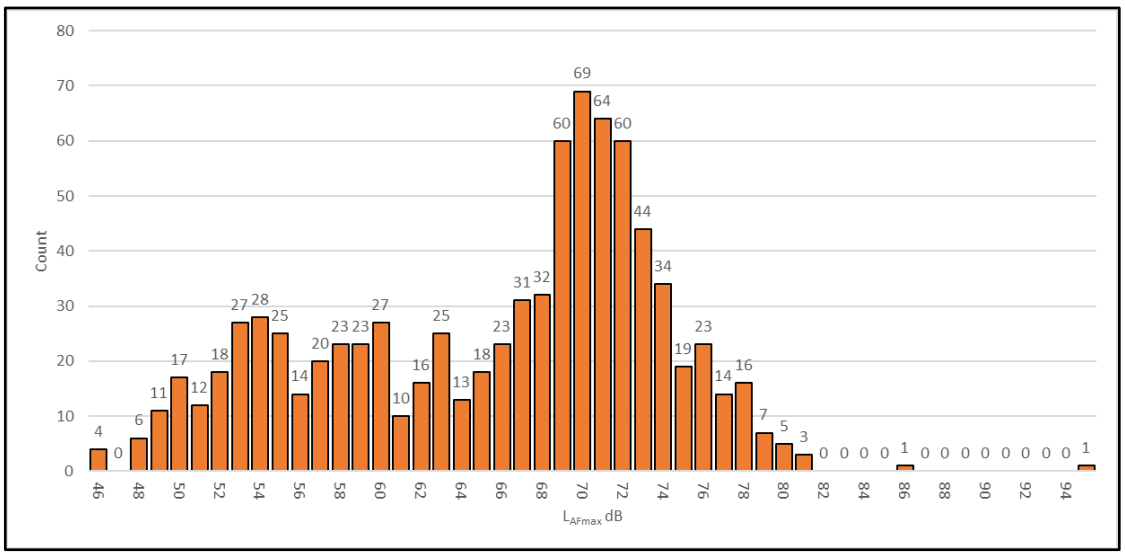


Figure 12.4: Distribution of the Magnitude of Night Time Events

On review of the data, the value of 75 dB L_{Amax} is not typically exceeded 10 no. times during a given night-time period….

12.3.4 Likely Evolution of the Baseline

Due to the proposed development, and others in the area, the baseline noise levels have the potential to increase in the future due to increases in traffic volumes. This has been accounted for in the assessment in Sections 12.5.3, 12.5.4, 12.5.5, 12.6.1 and 12.6.2.

12.4 Assessment Criteria - Construction and Operational Phases

12.4.1 Construction Phase - Noise Criteria

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 west of the site (White Pines North), which are located approximately 10m from the development site at their closest point.

BS 5228-1:2009+A1:2014 sets out guidance on permissible noise levels relative to the existing noise environment. Table 12.4 sets out the values which, when exceeded, signify a significant effect at the facades of residential receptors.

Assessment category and threshold value period (LAeq)	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	55	60	65
Night-time (23:00 to 07:00hrs)	45	50	55

Table 12.4: 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 **70 dB $L_{Aeq,1hr}$**.

12.4.2 Construction Phase - Vibration Criteria

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 12.5mm/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 12.5 are recommended for nearby properties.

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 12.5: Transient vibration guidance values for avoidance of cosmetic building damage

12.4.2.1 Human Perception

People are sensitive to vibration stimuli at levels orders of magnitude below those which have the potential to cause any cosmetic damage to buildings. Vibration typically becomes perceptible at around 0.15 to 0.3 mm/s and may become disturbing or annoying at higher magnitudes. However, higher levels of vibration are typically tolerated for single events or events of short-term duration, particularly during construction projects and when the origin and or the duration of vibration is known. For example, piling can typically be tolerated at

vibration levels up to 6 mm/s if adequate public relations are in place or up to 12 mm/s during blasting when advance warning is given and timeframes are known. These values refer to the day-time periods only.

During surface construction works (piling and groundbreaking etc.) the vibration limits set within Table 12.5 would be perceptible to building occupants and have the potential to cause subjective effects. The level of effect is, however, greatly reduced when the origin and time frame of the works are known and limit values relating to structural integrity are adequately communicated. In this regard, the use of clear communication and information circulars relating to planned works, their duration and vibration monitoring can significantly reduce vibration effects to the neighbouring properties.

12.4.3 Operational Phase – Additional 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 12.6 offers guidance as to the likely impact associated with any particular change in traffic noise level (Source DMRB, 2019).

Long Term Magnitude	DMRB Magnitude of Impact Long Term Noise Change (dB $L_{A10,18hr}$ or L_{night})
Greater than or equal to 10.0	Major
5.0 to 9.9	Moderate
3.0 to 4.9	Minor
Less than 3.0	Negligible

Table 12.6: Likely Impact Associated with Change in Traffic Noise Level

12.4.4 Operational Phase – Mechanical Plant and Services

Once a development of this nature becomes fully operational, a variety of electrical and mechanical plant will be required to service 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. Plant contained within plantrooms has the least potential for impact once consideration is given to appropriate design of the space.

BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

For an appropriate BS 4142 assessment it is necessary to compare the measured external background noise level (i.e. the $L_{A90,T}$ level measured in the absence of plant items) to the rating level ($L_{Ar,T}$) of the various plant items, when operational. Where noise emissions are

found to be tonal, impulsive in nature or irregular enough to attract attention, BS 4142 also advises that a penalty be applied to the specific level to arrive at the rating level.

The subjective method for applying a penalty for tonal noise characteristics outlined in BS 4142 recommends the application of a 2dB penalty for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible.

The following definitions as discussed in BS 4142 as summarised below:

"ambient noise level, $L_{Aeq,T}$"	is the noise level produced by all sources including the sources of concern, i.e. the residual noise level plus the specific noise of mechanical plant, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T].
"residual noise level, $L_{Aeq,T}$"	is the noise level produced by all sources excluding the sources of concern, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T].
"specific noise level, $L_{Aeq,T}$"	is the sound level associated with the sources of concern, i.e. noise emissions solely from the mechanical plant, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T].
"rating level, $L_{Ar,T}$"	is the specific sound level plus any adjustments for the characteristic features of the sound (e.g. tonal, impulsive or irregular components);
"background noise level, $L_{A90,T}$"	is the sound pressure level of the residual noise that is exceeded for 90% of the time period T.

If the rated plant noise level is +10 dB or more above the pre-existing background noise level then this indicates that complaints are likely to occur and that there will be a significant adverse impact. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

12.4.5 Operational Phase – Residential Inward Noise Impact

12.4.5.1 South Dublin County Council Noise Action Plan (NAP)

The Dublin Agglomeration Environmental Noise Action Plan December 2018 – November 2023 Vol. 4 – South Dublin County Council (NAP) was published in December 2018. The NAP states the following with respect to assessing the noise impact on new residential development:

> *"When new developments are being constructed it is important that both houses and apartments are designed, orientated and located in such a way so as to limit the impacts of noise from traffic. All new applications for residential developments will be assessed and where there is the likelihood of an adverse noise impact the applicant will be required to produce a noise impact assessment carried out by appropriately*

qualified acousticians and competent persons. The noise impact assessment should demonstrate that all facets of the UK "Professional Practice Guidance on Planning & Noise" (2017) (ProPG) have been followed."

In addition to the above, the following is also stated in the NAP:

"In the scenario where new residential development or other noise sensitive development is proposed in an area with an existing climate of environmental noise, there is currently no clear national guidance on appropriate noise exposure levels. The EPA has suggested that in the interim that Action Planning Authorities should examine the planning policy guidance notes issued in England titled, 'ProPG Planning and Noise: Professional Practice Guidance on Planning and Noise'. This has been produced to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England.

In advance of any national guidance relating to noise in the planning process, the following actions relating to planning and development will be considered for implementation:

a. *To review existing guidelines and policy relating to Noise in the County Development Plan and to ensure noise is a consideration in Local Area Plans and Part 8's and enhanced in the next County Development Plan.*
b. *To require developers to produce a sound impact assessment and mitigation plans, where necessary, for any new development where the Planning Authority considers that any new development will impact negatively on pre-existing environmental noise levels within their Council area.*
c. *To ensure that future developments are designed and constructed in accordance best Irish practice to minimise noise disturbances through good acoustic design and take into account the multifunction uses of street (e.g. movement, recreation)."*

In accordance with this NAP policy, this EIAR chapter includes an Acoustic Design Statement (ADS).

12.4.5.2 Professional Practice Guidance on Planning & Noise (ProPG)

The *Professional Practice 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 12.5 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.

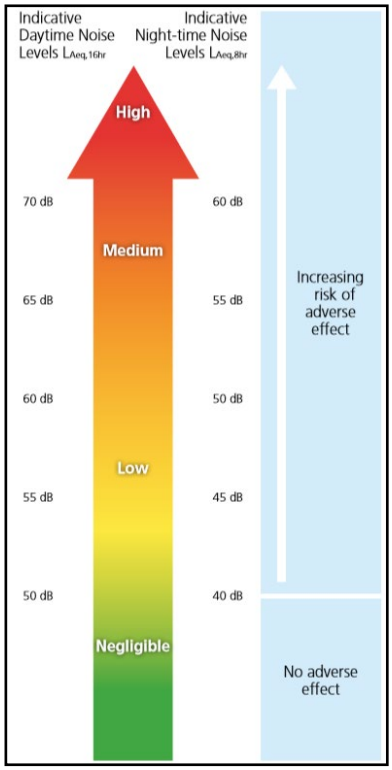


Figure 12.5: ProPG Stage 1 - Initial Noise Risk Assessment

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 12.7 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 $L_{AFmax*Note}$

Table 12.7 : 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 $L_{Aeq,16hr}$."*

12.4.6 Operational Phase – Vibration Criteria

There are no expected sources of vibration associated with the operational phase, therefore, vibration criteria have not been specified for this phase.

12.5 Identification of Impacts

12.5.1 Construction Phase – Noise Impacts

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 19:00hrs, Monday to Friday and 09:00 to 13:00 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 12.11 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.

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.

Phase	Item of Plant (BS 5228-1:2009+A1:2014 Ref.)	Construction Noise Level at 10m Distance (dB L_{Aeq})
Site Preparation	Wheeled Loader Lorry (D3 1)	75
	Track Excavator (C2 22)	72
	Dozer (C2.13)	78
	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 12.11: Typical Noise Levels Associated with Construction Plant Items

Table 12.12 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 various distances to reflect the varying distances that works will take place from nearby sensitive receptors.

Phase	Item of Plant (BS 5228-1:2009+A1:2014 Ref.)	Predicted at Construction Noise at 10m distance dB L_{Aeq}	Predicted at Construction Noise at 25m distance dB L_{Aeq}	Predicted at Construction Noise at 50m distance dB L_{Aeq}
Site Preparation	Wheeled Loader Lorry (D3 1)	67	59	53
	Track Excavator (C2 22)	64	56	50
	Dozer (C2.13)	70	62	56
	Dump Truck (C4.2)	70	62	56
Site Preparation Total		**74**	**66**	**60**
Foundations	Tracked Excavator (C3.24)	66	58	52
	Concrete Pump (C3.25)	70	62	56
	Compressor (D7 6)	69	61	55
	Poker Vibrator (C4 33)	70	62	56
	Large Rotary Bored Piling Rig (C3.14)	75	67	61
Foundations Total		**78**	**70**	**64**
General Construction	Hand tools	73	65	59
	Tower Crane (C4.48)	68	60	54
	Pneumatic Circular Saw (D7.79)	67	59	53
	Internal fit – out	62	54	48
General Construction Total		**75**	**67**	**61**
Landscaping	Dozer (C2.13)	70	62	56
	Dump Truck (C4.2)	70	62	56
	Surfacing (D8.25)	60	52	46
Landscaping Total		**73**	**65**	**59**

Table 12.12: Construction Noise Predictions

It is predicted that when works take place at the closest distances to the receptors a significant impact will occur. In addition, any rock breaking that may be required is likely to give rise to significant levels of noise temporarily at the various predicted distances. However, aside from breaking works, it is expected that most construction activities will not cause significant impacts at distances further than 25m of the receptor 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. Once consideration is given to the mitigation measures discussed in Section 12.6, 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.

12.5.2 Vibration from Construction Activities

Potential for vibration impacts during the construction phase programme are likely to be limited given the distances to the receptor locations. Expected vibration levels during piling assuming augured or bored piles have been determined through reference to published empirical data. The British Standard BS 5228 – *Part 2: Vibration*, publishes the measured magnitude of vibration of rotary bored piling using a 600mm pile diameter for bored piling into soft ground over rock, (Table D.6, Ref. No. 106):

- 0.54mm/s at a distance of 5m, for auguring;
- 0.22mm/s at a distance of 5m, for twisting in casing;
- 0.42mm/s at a distance of 5m, for spinning off, and;
- 0.43mm/s at a distance of 5m, for boring with rock auger.

Taking into account the distance to the receptors vibration emissions from this activity will be significantly reduced. Vibration levels at the closest neighbouring buildings are expected to be orders of magnitude below the limits set out in Table 12.5. Vibration levels are also expected to be below a level that would cause disturbance to building occupants.

During ground breaking in the excavation phase, there is also potential for vibration to be generated through the ground. Empirical data for this activity is not provided in the BS 5228-2:2009+A1:2014 standard, however the likely levels of vibration from this activity is expected to be significantly below the vibration criteria for building damage on experience from other sites. AWN Consulting have previously conducted vibration measurements under controlled conditions, during trial construction works, on a sample site where concrete slab breaking was carried out. The trial construction works consisted of the use of the following plant and equipment when measured at various distances:

- 3 tonne hydraulic breaker on small CAT tracked excavator
- 6 tonne hydraulic breaker on large Liebherr tracked excavator

Vibration measurements were conducted during various staged activities and at various distances. Peak vibration levels during staged activities using the 3 Tonne Breaker ranged from 0.48 to 0.25 PPV (mm/s) at distances of 10 to 50m respectively from the breaking activities. Using a 6 Tonne Breaker, measured vibration levels ranged between 1.49 to 0.24 PPV (mm/s) at distances of 10 to 50m respectively.

The range of values recorded provides some context in relation typical ranges of vibration generated by construction breaking activity likely required on the proposed site. The range of vibration magnitudes indicate vibration levels at the closest neighbouring buildings are likely to be orders of magnitude below the limits set out in Table 12.5. Vibration levels are also expected to be below a level that would cause disturbance to building occupants.

In this instance, taking account of the distance to the nearest sensitive off-site buildings and the range of vibration levels typically encountered at close distances to the works, vibration levels at the closest neighbouring buildings are expected to be orders of magnitude below the limits set out in Table 12.5. Vibration levels are also expected to be below a level that would cause disturbance to building occupants.

12.5.3 Operational Phase – Additional Vehicular Traffic on Public Roads

A Traffic Impact Assessment relating to the proposed development has been prepared 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 for the opening year, opening year +5 and the opening year +15. The calculated change in noise levels during these two periods are summarised in Table 12.13. The assessed roads/routes are indicated in Figure 12.6.

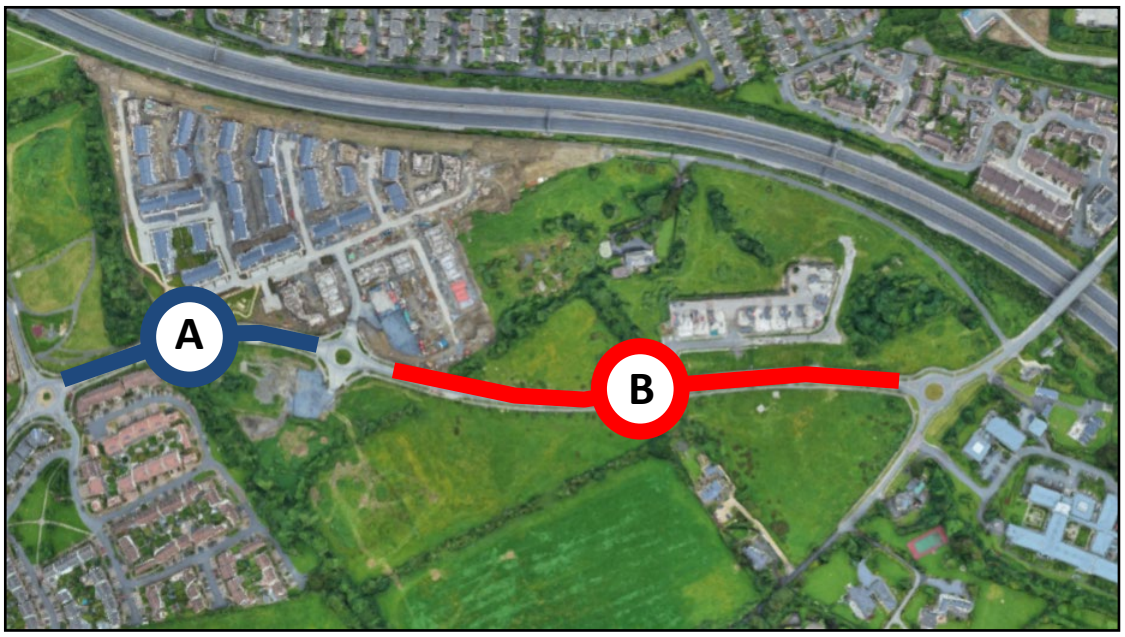


Figure 12.6: Assessed Routes

Year	Calculated Change in Traffic Noise Levels for Each Road, dB	
	A	B
2022	+0.2	+0.0
2027	+0.2	+0.2
2037	+0.4	+0.4

Table 12.13: Calculated change in traffic noise levels for Do Something Scenarios

The calculations indicate that the highest change in noise level will be +0.4 dB. Referring to the criteria presented in Table 12.6 it can be concluded that the changes in noise level for all assessed roads will be negligible and Not Significant.

12.5.4 Operational Phase – Plant Noise

Once operational, there will be building services plant items required to serve the development. Details of the items of plant have not been finalised, therefore it is not possible to calculate noise levels to the surrounding environment. These items will be selected at a later stage and will be designed and located so that there is no negative impact on sensitive receivers within the development itself or on nearby sensitive receptors. The cumulative operational noise level from building services plant at the nearest noise sensitive locations external to the development will be designed/attenuated to meet the relevant BS 4142 noise criteria for day and night-time periods provided in Table 12.14 below.

Day, dB $L_{Aeq,1hr}$	Night, dB $L_{Aeq,15min}$
53	39

Table 12.14: Proposed Noise Criteria for Plant Noise

12.5.5 Operational Phase – ProPG Stage 1 – Noise Risk Assessment

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 12.5 previously presented 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.

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.

Paragraph 2.9 of ProPG states that:

> *"The noise risk assessment may be based on measurements or prediction (or a combination of both) as appropriate and should aim to describe noise levels over a "typical worst case" 24 hour day either now or in the foreseeable future."*

In this instance a 3D computer noise model of the development site has been developed to predict the noise levels across the entire site in order to investigate the initial noise risk. The selected software, Brüel & Kjær Type 7810 *Predictor*, calculates noise levels in accordance with the *Calculation of Road Traffic Noise (CRTN - ISBN 0 11 550847 3)* issued by the UK Department of Transport in 1988. This is the standard recognised for the prediction of road traffic noise by Transport Infrastructure Ireland (TII) and the Environmental Noise Regulations 2006 SI/140 2006.

The following information was included in the model:

- Site layout drawings of proposed development;
- OS mapping of surrounding environment;

- Annual Average Daily Traffic (AADT) obtained from the TII Traffic Data Site[1] 114,027 vehicles per day with 2.9% HGV along the M50.

12.5.5.1 Model Validation

Noise levels recorded during the baseline noise survey were used to calibrate the noise model. This is done by comparing the predicted levels at a height of 4m from the noise model against the levels measured at the site also at a height of 4m. This 4m height is used as it typically represents first-floor level and has a better line of sight to noise sources in the surrounding environment. Noise levels are calculated over daytime periods (07:00 to 23:00 hrs) and night-time periods (23:00 to 07:00 hrs). Table 12.15 details the results of the noise model predictions and compares them to the measured values at the survey location. The results indicate that there is a strong correlation between measured noise levels and the noise model.

Location	Time Period	Measured Noise Level, dB	Predicted Noise Level, dB
1	Day	65	65
	Night	57	58

Table 12.15: Predicted & Measured Noise Levels at Development Site

12.5.5.2 Noise Risk Classification of the Site

Following the methodology outlined in ProPG, as discussed in 12.4.5.2, the noise model has been used to predict noise levels across the site at height levels of 4m and 10m. The results of this exercise are presented in Figures 12.7 to 12.10.

[1] Obtained from Site No. 1505 M50 between jn11 Tallaght and jn12 Firhouse https://www.nratrafficdata.ie/c2/calendar_alt.asp?sgid=ZvyVmXU8jBt9PJE$c7UXt6&spid=NRA_000000001505



Figure 12.7: Predicted Existing Noise Contour at 4m Height – Daytime

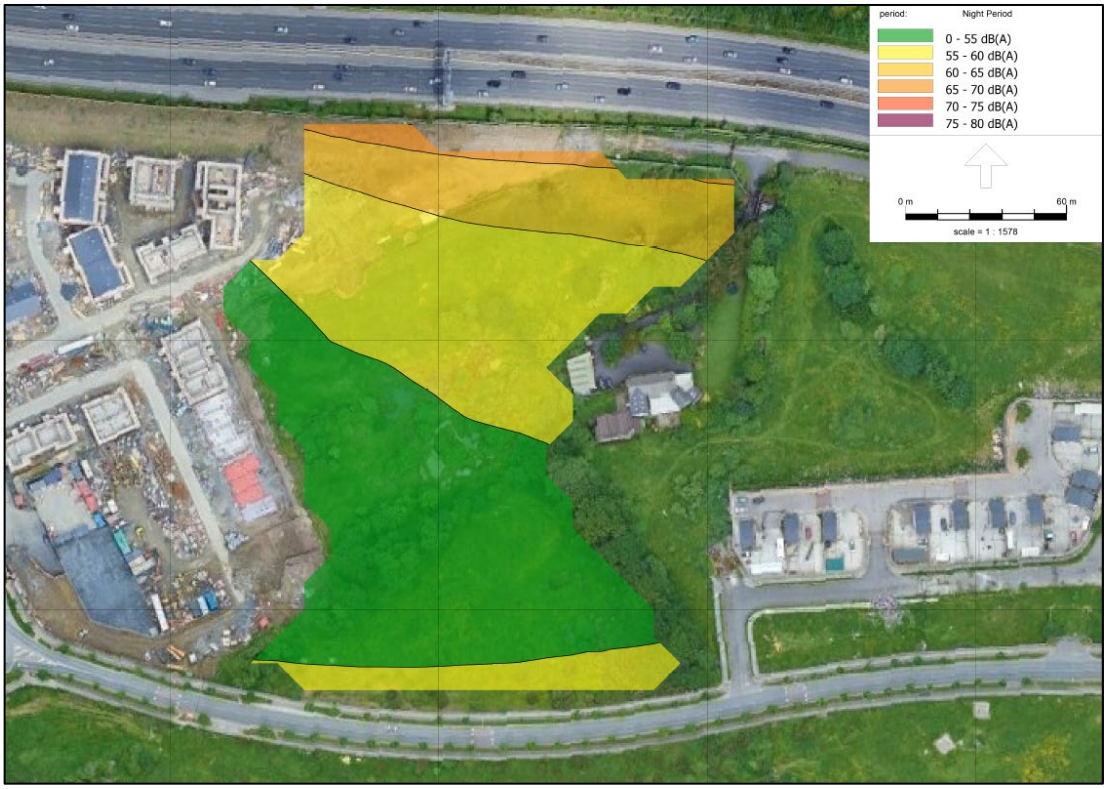


Figure 12.8: Predicted Existing Noise Contour at 4m Height – Night-Time



Figure 12.9: Predicted Existing Noise Contour at 10m Height – Daytime



Figure 12.10: Predicted Existing Noise Contour at 10m Height – Night-Time

Road traffic noise levels calculated across the majority of the site during daytime periods are between 60 and 75 dB $L_{Aeq,16hr}$. Night-time noise levels are the order of 55 to 70 dB $L_{Aeq,8hr}$ across the site in this situation.

Giving consideration to the measured and predicted 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 medium to high noise risk.

ProPG states the following with respect to medium and high 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.*

High Risk *High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS. Applicants are strongly advised to seek expert advice.*

Given the above it can be concluded that the development site may be categorised as Medium to High 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 suitable 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 predicted across the site during day and night-time periods with the proposed buildings in place. The noise model indicates that façade levels across the site are of a magnitude that sound insulation performance of the building façade becomes important

and a minimum sound insulation performance specification is required for windows and vents to ensure that the internal noise criteria are achieved.

Figure 12.11 identifies those facades where a higher mitigation in the form of enhanced glazing and ventilation will be required, unmarked facades will also still require a minimum specification, however it will be of a lower strength. The specification of this enhanced façades are discussed in Section 12.6.1.

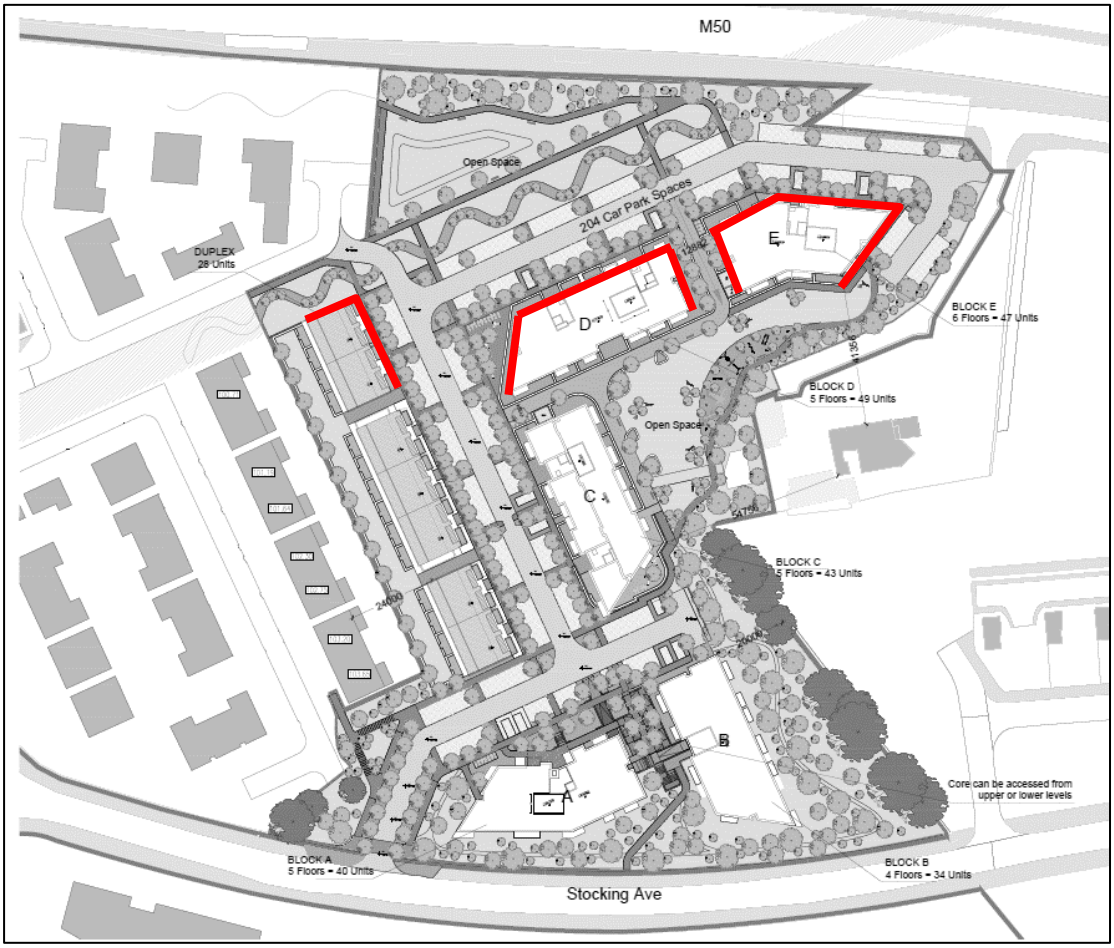


Figure 12.11: Facades Requiring Higher Level of Acoustic Glazing and Ventilation Specifications

12.5.6 Operational Phase – ProPG Stage 2 – Full Acoustic Assessment

The following sections discuss the approach taken in line with the Good Acoustic Design (GAD) process outlined in the ProPG guidance document.

12.5.6.1 ProPG Guidance

In practice, GAD should deliver the optimum acoustic design for a particular site without adversely affecting residential amenity or the quality of life or occupants or compromising other sustainable design objectives. It is important to note that ProPG specifically states that GAD is not equivalent to overdesign or "gold plating" of all new development but that it seeks to deliver the optimum acoustic environment for a given site.

Section 2.23 of the ProPG outlines the following checklist for GAD:

- Check the feasibility of relocating, or reducing noise levels from relevant sources;
- Consider options for planning the site or building layout;
- Consider the orientation of proposed building(s);
- Select construction types and methods for meeting building performance requirements;
- Examine the effects of noise control measures on ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc;
- Assess the viability of alternative solutions; and,
- Assess external amenity area noise.

In the context of the proposed development, each of the considerations listed above have been addressed in the following subsections.

12.5.6.2 Application of GAD Process to Proposed Application

Relocation or Reduction of Noise from Source

The surrounding road network is located outside the redline boundary of the site and therefore it is beyond the scope of this development to introduce any noise mitigation at source.

Planning, Layout and Orientation

A primary consideration to control noise was to ensure that the residential units were set back, away from the busy M50. An existing noise barrier along the length of the M50 is also being retained in order to reduce noise levels across the site.

Select Construction Types for Meeting Building Regulations

A mix of construction types could be considered for the building envelope including masonry and curtain wall elements. Masonry construction types offers high levels of sound insulation performance. However, as is typically the case the glazed elements and any required ventilation paths to achieve compliance with Part F of the Building Regulations will be the weakest elements in the façade in terms of sound insulation performance.

Consideration will therefore be given to the provision of upgraded glazing and acoustic ventilators. Note that it will not be possible to achieve the desirable internal acoustic environments with windows open. Instead the proposal here will be to provide dwelling units with glazed elements and ventilators that have good acoustic insulation properties so that when the windows are closed the noise levels internally are good. Inhabitants will be able to open the windows if they wish, however, doing so will increase the internal noise level. This approach to mitigation is supported in ProPG where it states the following (note emphasis has been added in bold),

> *"2.22 Using fixed unopenable glazing for sound insulation purposes is generally unsatisfactory and should be avoided;* ***occupants generally prefer the ability to have control over the internal environment using openable windows, even if the acoustic conditions would be considered unsatisfactory when open.*** *Solely relying on sound insulation of the building envelope to achieve acceptable acoustic conditions in new residential development, when other methods could reduce the need for this approach, is not regarded as good*

acoustic design. Any reliance upon building envelope insulation with closed windows should be justified in supporting documents.

Note 5 Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded

2.34 Where the LPA accepts that there is a justification that the internal target noise levels can only be practically achieved with windows closed, ***which may be the case in urban areas and at sites adjacent to transportation noise sources,*** *special care must be taken to design the accommodation so that it provides good standards of acoustics, ventilation and thermal comfort without unduly compromising other aspects of the living environment. In such circumstances, internal noise levels can be assessed with windows closed but with any façade openings used to provide "whole dwelling ventilation" in accordance with Building Regulations Approved Document F (e.g. trickle ventilators) in the open position (see Supplementary Document 2). Furthermore, in this scenario the internal L_{Aeq} target noise levels should not generally be exceeded."*

Impact of Noise Control Measures on Fire, Health and Safety etc

The GAD measures that have been implemented on site, e.g. locating properties away from the road, placing outdoor space on the quiet side of buildings, are considered to be cost neutral and do not have any significant impact on other issues.

Assess Viability of Alternative Solutions
This will be explored as the project progresses and the noise model will be used to assess the acoustic benefit of any alternative solutions.

Assess External Amenity Area Noise
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 $L_{Aeq,16hr}$."

The values are largely based on WHO guideline values.

Given the close proximity of the M50 to the development site it is predicted that there will be a reasonable level of traffic noise audible across the site on the ground level. A noise barrier has been retained along the length of the M50 to attenuate the noise across these external areas. Figure 12.12 presents noise contours of the external areas. It can be seen in these external areas that the site partially falls into the 55 dB $L_{Aeq,16hr}$ guidance value. It should be noted that ProPG provides some guidance on how to offset impacts from higher than desirable external noise levels, in this instance *"a relatively quiet, protected, publicly accessible, external*

amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance)" can be found less than 5 minutes walk from the development (Figure 12.13). The park area is further set back from the M50 and, hence, road traffic noise will be reduced at this location. It is considered that the objective of achieving suitable external noise levels is achieved within the overall site.



Figure 12.12: Predicted Noise Levels Across External Areas (1.5m above ground)



Figure 12.13: Figure indicated location of nearby park land within 4min distance of the development.

Summary
Considering the constraints of the site, in so far as possible and without limiting the extent of the development area, the principles of GAD have been applied to the development.

In terms of viable alternatives to acoustic treatment of façade elements, currently it is not considered likely that there will be further options for mitigation outside of proprietary acoustic glazing and ventilation.

12.6 Mitigation

12.6.1 Construction Phase - Noise

In terms of noise mitigation, the following are some typical measures that may be employed to reduce the effects of noise on the surrounding receptors:

- Use of a standard site hoarding, typically 2.4m height will be erected around the perimeter of the construction site for the duration of works;
- Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- Monitoring levels of noise and vibration during critical periods and at sensitive locations;
- Maintaining site access roads even so as to mitigate the potential for vibration from lorries;
- Selection of plant with low inherent potential for generation of noise and/ or vibration;
- Erection of barriers as necessary around items such as generators or high duty compressors;
- Situate any noisy plant as far away from sensitive properties as is reasonably practicable and the use of vibration isolated support structures where necessary;
- Establishing channels of communication between the contractor/developer, Local Authority and residents, and;
- Appointing a site representative responsible for matters relating to noise and vibration.

12.6.2 Operational Phase – Mechanical and Electrical Plant

As part of the detailed design of the development, plant items with appropriate noise ratings and, where necessary, appropriately selected remedial measures (e.g. enclosures, silencers etc.) will be specified in order that the adopted plant noise criteria is achieved at the façades of noise sensitive properties, including those within the development itself.

12.6.3 Operational Phase – Inward Noise

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. blockwork 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 will be provided with glazing and ventilation that achieves the minimum sound insulation performance as set out in Table 12.12 and Table 12.13).

Façade Ref	Octave Band Centre Frequency (Hz)						R_w
	125	250	500	1k	2k	4k	
RED	27	27	37	45	44	54	42
All Other Facades	27	26	33	39	39	47	37

Table 12.12: Sound Insulation Performance Requirements for Glazing, SRI (dB)

Façade Ref	Octave Band Centre Frequency (Hz)						$D_{,n,ew}$
	125	250	500	1k	2k	4k	
RED	31	33	42	43	39	44	42
All Other Facades	29	30	37	39	36	42	39

Table 12.13: Minimum Ventilation Sound Insulation Performance Requirements, $D_{,n,e}$ (dB)

The overall R_w and $D_{ne,w}$ outlined above are provided for information purposes only. The over-riding requirements are the octave band sound insulation performance values which may also be achieved using alternative glazing and ventilation configurations. Any selected system will be required to provide the same or greater level of sound insulation performance as that set out in Tables 12.12 and 12.13.

It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing and ventilation systems. 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.

The assessment has demonstrated that the recommended internal noise criteria can be achieved through consideration of the proposed façade elements at the design stage. The calculated glazing and ventilation specifications are preliminary and are intended to form the basis for noise mitigation at the detailed design stage. Consequently, these may be subject to change as the project progresses.

12.7 Residual Effects

12.7.1 Construction Noise

It is predicted that when works take place at the closest distances to the receptors a significant impact will occur. In addition, any rock breaking that may be required is likely to give rise to significant levels of noise temporarily at the various predicted distances. However, aside from breaking works, it is expected that most construction activities will not cause significant impacts at distances further than 25m of the receptor locations. It should be noted that the assessment can be considered worst case and it is unlikely that all items of plant assessed will be in operational simultaneously. Additionally, the predictions only indicate a potential significant effect (based on a worst-case scenario) when working at the closest location to the dwellings, with lesser impacts predicted at all other locations across site.

Residual impacts associated with construction activities undertaken on site within 25m of sensitive receptors are categorised as:

Quality	*Significance*	*Duration*
Negative	Significant	Temporary

At all other distances the impacts are categorised as:

Quality	*Significance*	*Duration*
Negative	Moderate	Short-term

12.7.2 Construction Vibration

The impacts are predicted to be as follows:

Quality	*Significance*	*Duration*
Negative	Not Significant	Short-term

12.7.3 Additional Traffic on Roads

The impacts are predicted to be as follows:

Quality	*Significance*	*Duration*
Neutral	Not Significant	Permanent

12.7.4 Operational Outward Noise Impact

The impacts are predicted to be as follows:

Quality	*Significance*	*Duration*
Neutral	Not Significant	Permanent

12.7.5 Inward Noise Impact

In terms of the inward noise impacts, specification of noise mitigation has been recommended so that the internal noise criterion is met. With mitigation measures in place it is expected that the impacts will be categorised as:

Quality	*Significance*	*Duration*
Neutral	Not Significant	Permanent

12.8 Cumulative Effects

There are a number of approved applications in the local area including Stocking Retail, South Dublin Reg. Ref. SD19A/0345 and Stocking South - South Dublin Reg. Ref. SD19A/0099/ ABP Ref. PL06S.304670. There is also a proposed application for Stocking Central that will lie directly to the south of this development.

It is expected that the phase most likely to be affected by cumulative impacts is the construction phase. Due to the proximity and adjacency of both the Stocking Retail site and

the Stocking Central site it is likely that cumulative impacts will occur at the nearest receptor should all sites progress construction works simultaneously. In this scenario elevated construction noise emissions due to cumulative noise are likely to occur at receptor locations equidistant to both sites (i.e. the White Pines North site) as well as a potential increase in the length of time that the receptor will be exposed to construction noise. Hence, cumulative construction impacts will need to be considered and managed during the construction phase. It is recommended that liaison between construction sites is on-going throughout the duration of the construction phase. Contractors should schedule work in a co-operative effort to limit the duration and magnitude of potential cumulative impacts on nearby sensitive receptors. Cumulative construction noise impacts are expected to be negative, significant and short-term.

During the operational phase any cumulative impacts will be due to an increase in road traffic noise. However, given the insignificant levels of noise increase as a result of the traffic associated with this proposed development, it is not expected that cumulative traffic noise will increase by any significant margin as a result of this proposed development.

12.9 Monitoring

12.9.1 Construction Stage

During the construction phase noise monitoring will be undertaken at the nearest sensitive locations to ensure construction noise limits outlined in Table 12.4 are not exceeded. Noise monitoring will be conducted in accordance with the International Standard ISO 1996: *Acoustics – Description, measurement and assessment of environmental noise* Part 1 (2016) and Part 2 (2017). The selection of monitoring locations will be based on the nearest sensitive buildings to the working areas.

It is recommended that noise control audits are conducted at regular intervals throughout the construction programme in conjunction with noise monitoring. The purpose of the audits will be to ensure that all appropriate steps are being taken to control construction noise emissions and to identify opportunities for improvement, where required.

12.9.2 Operational Stage

There is no monitoring recommended for the operational phase of the development as effects to noise and vibration are predicted to be not significant.

12.10 Reinstatement

Not applicable to noise and vibration.

12.11 Difficulties Encountered

There were no difficulties encountered while completing this assessment.

12.12 References

- British Standard BS 8233: 2014: *Guidance on sound insulation and noise reduction for buildings;*
- British Standard BS 4142: 2014+A1:2019: *Methods for Rating and Assessing Industrial and Commercial Sound;*
- British Standard BS 5228: 2009 +A1:2014: *Code of Practice for Control of Noise and Vibration on Construction and Open Sites Part 1: Noise & Part 2: Vibration;*
- British Standard BS 7385: 1993: *Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration;*
- *Calculation of Road Traffic Noise*, Department of Transport Welsh Office, HMSO, 1988;
- Design Manual for Roads & Bridges – Volume 11 Section 3 (2019);
- *EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports,* (Draft August 2017),
- *EPA Advice Notes for Preparing Environmental Impact Statements,* (Draft, September 2015),
- *EPA Guidelines on the Information to be contained in Environmental Impact Statements,* (EPA, 2002);
- ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise;*
- ISO 9613: 1996: *Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation*, and;
- *Dublin Agglomeration Environmental Noise Action Plan December 2018 – November 2023* Vol. 4 – South Dublin County Council (NAP).

13.0 MATERIAL ASSETS – WASTE

13.1 Introduction

This chapter of the EIAR comprises an assessment of the likely impact of the proposed development on the waste generated from the development as well as identifying proposed mitigation measures to minimise any impacts.

A site-specific Construction and Demolition Waste Management Plan (C&D WMP) has been prepared by AWN Consulting Ltd to deal with waste generation during the construction phase of the project and has been included as Appendix 13.1. The C&D WMP was prepared in accordance with the 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' document produced by the National Construction and Demolition Waste Council (NCDWC) in conjunction with the Department of the Environment, Heritage and Local Government in July 2006.

A separate Operational Waste Management Plan (OWMP) has also been prepared for the operational phase of the development and is included as Appendix 13.2 of this chapter.

These documents will ensure the sustainable management of wastes arising at the development in accordance with legislative requirements and best practice standards

13.2 Methodology

The assessment of the impacts of the proposed development arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports. A summary of the documents reviewed, and the relevant legislation is provided in the C&D WMP and in the OWMP provided in Appendix 13.1 and 13.2.

This Chapter is based on the proposed development, as described in Chapter 3 and considers the following aspects:

- Legislative context;
- Demolition phase;
- Construction phase (including preparation, excavation and levelling); and,
- Operational phase.

A desk study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the demolition, construction and operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the demolition, construction and operational phases of the proposed development have been calculated. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research, other available research sources and waste collection data from the existing neighbouring development.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Section 13.6.

A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 8 Land and Soil. Chapter 8 of the EIAR also discusses the environmental quality of any soils which will have to be excavated to facilitate construction of the proposed development.

13.2.1 Legislation and Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended).

In addition, the Irish government issues policy documents which outline measures aimed to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan*, A Resource Opportunity* in 2012. The need to embed climate action in all strands of public policy aligns with the goals of the European Green Deal

The strategy for the management of waste from the construction phase is in line with the requirements of the Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects published in 2006. The guidance document Construction and Demolition Waste Management: A handbook for Contractors and Site Managers was also consulted in the preparation of this assessment.
There are currently no Irish guidelines on the assessment of operational waste generation and guidance is taken from industry guidelines, plans and reports including the *EMR Waste Management Plan 2015 – 2021, BS 5906:2005 Waste Management in Buildings – Code of Practice, 5*. The South Dublin County Council (SDCC) '*South Dublin County Council Household & Commercial Waste Bye-Laws* (2018), *the EPA National Waste Database Reports 1998 – 2012* and the *EPA National Waste Statistics Web Resource.*

13.3 Receiving Environment (Baseline Situation)

The subject site is c.2.98 hectare site located on lands north of Stocking Avenue, Ballycullen, Dublin 16.

In terms of waste management, the receiving environment is largely defined by South Dublin County Council (SDCC) as the Local Authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021.

The waste management plan sets out the following targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The Regional Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of "70% preparing for reuse, recycling and other recovery of construction and demolition waste" (excluding natural soils and stones and hazardous wastes) to be achieved by 2020. The Waste Action Plan for a Circular Economy continues with this target of keeping the reuse, recycling and other recovery of construction and demolition waste at or above 70%.

The National Waste Statistics update published by the EPA in August 2020 identifies that Ireland's current progress against this C&D waste target is at 77% and our progress against 'Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass (includes metal and plastic estimates from household WEEE)' is at 51%. Both of these targets are required to be met by 12 December 2020 in accordance with the requirements of the Waste Framework Directive, however the EPA are yet to confirm that these were met.

The South Dublin County Council Development Plan 2016 – 2022 also sets policies and objectives for the SDCC area which reflect those set out in the regional waste management plan.

In terms of physical waste infrastructure, SDCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the Eastern-Midlands Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and two waste-to-energy facilities.

13.4 Characteristics of the Proposed Development

The subject site is c.2.98 hectares, located on lands north of Stocking Avenue, Ballycullen, Dublin 16.

In summary, the proposed development comprises the construction 241 no. residential units and a dedicated community space. A full description of the development can be found in Chapter 3. The characteristics of the development that are relevant in terms of waste management are summarised below.

13.4.1 Demolition Phase

There is no demolition required for this project however there is a small amount of hardstanding that will need to be excavated as part of the site ground works. For further information please refer to Chapter 8 of this EIAR.

13.4.2 Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The construction contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

In addition topsoil and subsoil excavated to facilitate site preparation, construction of foundations, and the installation of underground services. The project engineers have estimated that c. 10,000 m^3 of material will require excavation. It is envisaged that some of this material will be removed offsite site in with c. 2,500m^3 expected to be kept for onsite reuse (see Section 8.5.1.2). These estimates will be refined prior to commencement of construction. If the material that requires removal from site is deemed to be a waste, removal and reuse/recycling/recovery/disposal of the material will be carried out in accordance with the *Waste Management Act 1996 (as amended*), the *Waste Management (Collection Permit) Regulations 2007 (as amended)* and the *Waste Management (Facility Permit & Registration) Regulations 2007 (as amended)*. The volume of waste requiring recovery/disposal will dictate whether a Certificate of Registration (COR), permit or licence is required for the receiving facility. Alternatively, the material may be classed as by-product under Article 27 classification *(European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011).*

In order to establish the appropriate reuse, recovery and/or disposal route for the soils and stones to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous. Environmental soil analysis will be carried out prior to removal of the material on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste including potential pollutant concentrations and leachability. It is anticipated that the surplus material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities/landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment/recovery or exported abroad for disposal in suitable facilities.

Waste will also be generated from construction workers e.g. organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided onsite during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific C&D WMP. The C&D WMP provides

an estimate of the main waste types likely to be generated during the C&D phase of the proposed development and these are summarised in Table 13.1.

Waste Type	Tonnes	Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	415.9	10	41.6	80	332.8	10	41.6
Timber	352.9	40	141.2	55	194.1	5	17.6
Plasterboard	126.0	30	37.8	60	75.6	10	12.6
Metals	100.8	5	5.0	90	90.8	5	5.0
Concrete	75.6	30	22.7	65	49.2	5	3.8
Other	189.1	20	37.8	60	113.4	20	37.8
Total	**1260.4**		**286.1**		**855.8**		**118.5**

Table 13.1: Estimated off-site reuse, recycle and disposal rates for construction waste

It should be noted that until final materials and detailed construction methodologies have been confirmed it is difficult to predict with a high level of accuracy the C&D waste that will be generated from the construction of the proposed development as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

13.4.3 Operational Phase

As noted in Section 13.1, an OWMP has been prepared for the development and is included as Appendix 13.2. The OWMP provides a strategy for segregation (at source), storage and collection of all wastes generated within the building during the operational phase including dry mixed recyclables, organic waste and mixed non-recyclable waste as well as providing a strategy for management of waste glass, batteries, WEEE, printer/toner cartridges, chemicals, textiles, waste cooking oil and furniture.

The total estimated waste generation for the development for the main waste types based on the AWN WGM is presented in Tables 13.2 and 13.3 below and is based on the uses and areas as advised by the project architects (John Fleming Architects).

Waste type	Waste Volume (m^3/week)			
	Residential Block A	Residential Block B	Residential Block C	Residential Block D
Organic Waste	0.57	0.48	0.62	0.74
DMR	4.06	3.41	4.38	5.23
Glass	0.11	0.09	0.12	0.14
MNR	2.13	1.79	2.30	2.75
Total	**6.87**	**5.78**	**7.42**	**8.86**

Table 13.2: Estimated waste generation for the proposed development for the main waste types

Waste type	Waste Volume (m^3/week)	
	Residential Block E	Duplex Blocks (combined)
Organic Waste	0.72	0.50
DMR	5.13	3.56
Glass	0.14	0.10
MNR	2.70	1.87
Total	**8.69**	**6.02**

Table 13.3: Estimated waste generation for the proposed development for the main waste types

The residents will be required to provide and maintain appropriate waste receptacles within their units to facilitate segregation at source of these waste types. The location of the bins within the units will be at the discretion of the residents. As required, the residents will need to bring these segregated wastes from their units to their allocated Waste Storage Areas (WSAs). All WSA's can be viewed on the plans submitted with the application.

The OWMP seeks to ensure the development contributes to the targets outlined in the EMR Waste Management Plan 2015 – 2021 and the SDCC waste Bye-laws.

Mitigation measures proposed to manage impacts arising from wastes generated during the operation of the proposed development are summarised below.

13.5 Potential Impacts of the Proposed Development

This section details the potential waste effects associated with the proposed development.

13.5.1 Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during site excavation and construction. General housekeeping and packaging will also generate waste materials as well as typical municipal wastes generated by construction employees including food waste. Waste materials will be required to be temporarily stored on site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development and on adjacent developments. The indirect effect of litter issues is the presence of vermin within the development and the surrounding areas. the effect on the local environment is likely to be **short term, significant** and **negative.**

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste and result in indirect negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short term, significant** and **negative** Wastes arising will need to be taken to suitably registered/permitted/licenced waste facilities for processing and segregation, reuse, recycling, recovery, and/or disposal as appropriate. There are numerous licensed waste facilities in the Eastern Midlands region which can accept hazardous and non-hazardous waste materials and acceptance of waste from the proposed development would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of demolition and construction materials are either recyclable or recoverable.

When this is not undertaken the effect on the local and regional environment is likely to be **short term, significant** and **negative**.

There is a quantity of soil, stone, gravel and clay which will need to be excavated to facilitate the proposed development. It is anticipated that c. 7,500m^3 of excavated material will need to be removed offsite, however it is envisaged that c. 2,500m^3 of excavated material will be reused onsite. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short term, significant and negative.**

13.5.2 Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill. However, in the absence of mitigation, significant effects are not likely. The effect is likely to be **long term, non-significant** and **negative**.

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion in recycled products (e.g. paper mills and glass recycling).

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development and on adjacent developments. The knock-on effect of litter issues is the presence of vermin within the development and the surrounding areas. However, in the absence of mitigation, the effect on the local environment is likely to be **long term**, **significant** and **negative.**

Waste contractors will be required to service the development on a regular basis to remove waste. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, the effect on the local environment is likely to be **long term**, **significant** and **negative.**
The potential impact of operational waste generation from the development is considered to be **long-term, not significant** and **negative.**

13.6 Mitigation Measures

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

13.6.1 Construction Phase

As previously stated, a project specific C&D WMP has been prepared in line with the requirements of the requirements of the guidance document issued by the DoEHLG and is included as Appendix 13.1. Adherence to the high-level strategy presented in this C&D WMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development. Prior to commencement, the contractor(s) will be required to refine/update the C&D WMP or submit an addendum to C&D WMP to SDCC to detail specific measures to minimise waste generation and resource consumption and provide details of the proposed waste contractors and destinations of each waste stream.

A quantity of soil, stone, gravel and clay which will need to be excavated to facilitate the proposed development. Project Engineers have estimated that c. 10,000m^3 of excavated material will need to be removed offsite, however it is envisaged that c. 2,500m^3 excavated material will be reused onsite. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that the following waste types, at a minimum, will be segregated:
  - Concrete rubble (including ceramics, tiles and bricks);
  - Plasterboard;
  - Metals;
  - Glass; and
  - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site

as by-product (and not as a waste), this will be done in accordance with Article 27 of the EC (Waste Directive) Regulations (2011). EPA approval will be obtained prior to moving material as a by-product. However, it is not currently anticipated that Article 27 will be used.

These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, the EMR Waste Management Plan (2015-2021). It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources.

13.6.2 Operational Phase

As previously stated, a project specific OWMP has been prepared and is included as Appendix 13.2. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the EMR Waste Management Plan 2015 – 2021 and abiding by the DCC waste bye-laws.
In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
  - Organic waste;
  - Dry Mixed Recyclables;
  - Mixed Non-Recyclable Waste;
  - Glass;
  - Waste electrical and electronic equipment (WEEE);
  - Batteries (non-hazardous and hazardous);
  - Cooking oil;
  - Light bulbs;
  - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
  - Furniture (and from time to time other bulky waste); and
  - Abandoned bicycles.
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997*, the *EMR Waste Management Plan (2015 - 2021)* and the SDCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

13.7 Predicted Impact of the Proposed Development

The implementation of the mitigation measures outlined in Section 13.6 will ensure that the high rate of reuse, recovery and recycling is achieved at the development during the excavation and construction phases as well as during the operational phase. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

13.7.1 Construction Phase

A carefully planned approach to waste management as set out in Section 13.6 and adherence to the C&D WMP during the construction phase will ensure that the effect on the environment will be **short-term**, **imperceptible** and **neutral**.

13.7.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 13.6 will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be **long-term**, **imperceptible** and **neutral**.

13.7.3 Potential Cumulative Impacts

13.7.4 Construction Phase

Multiple permissions remain in place for other developments within the vicinity of the development. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase. Due to the high number of waste contractors in the Dublin region there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative effects associated with waste generation and waste management. As such the effect will be **short-term, not significant and negative.**

13.7.5 Operational Phase

There are similar existing residential developments close by along with the neighbouring residential sites and these developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a **long-term**, **imperceptible,** and **neutral.**

13.7.6 Do-Nothing Scenario

If the proposed development was not to go ahead there would be no demolition, excavation or construction or operational waste generated at this site. There will be a neutral effect on the environment.

13.8 Monitoring Measures

The management of waste during the construction phase should be monitored to ensure compliance with relevant local authority requirements, and effective implementation of the C&D WMP including maintenance of waste documentation.

The management of waste during the operational phase should be monitored to ensure effective implementation of the OWMP by the building management company and the nominated waste contractor(s).

13.8.1 Construction Phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the excavation and construction phases where there is a potential for waste management to become secondary to progress and meeting construction schedule targets. The C&D WMP specifies the need for a waste manager to appointed who will have responsibility to monitor the actual waste volumes being generated and to ensure that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the waste manager should identify the reasons for targets not being achieved and work to resolve any issues. Recording of waste generation during the project will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future projects.

13.8.2 Operational Phase

During the operational phase, waste generation volumes should be monitored against the predicted waste volumes outlined in the OWMP. There may be opportunities to reduce the number of bins and equipment required in the WSAs where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contactor costs.

13.9 Difficulties Encountered

There were no difficulties encountered during the production of this chapter of the EIAR.

13.10 Interactions

Adherence to the mitigation measures outlined in Section 13.9 will ensure that there are no significant impacts on resource or waste management from the proposed development. The management of waste during the construction phase in accordance with the C&D WMP and during the operational phase in accordance with the OWMP will meet the requirements of regional and national waste legislation and promote the management of waste in line with the priorities of the waste hierarchy.

13.10.1 Land and Soils

During the construction phase excavated topsoil and subsoil (c. 10,000 m^3) will be generated from the excavations required to facilitate site levelling, construction of new foundations and the installation of underground services. It is estimated that c. 7,500m^3 of excavated material will need to be removed offsite, however it is envisaged that c. 2,500m^3 material will be reused onsite. Where material has to be taken off site it will be taken for reuse or recovery, where practical, with disposal as last resort. Adherence to the mitigation measures in Chapter 13 and the requirements of the C&D WMP, will ensure the effect **is long-term, imperceptible** and **neutral**.

13.10.2 Traffic and Transportation

Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the development. The increase in vehicle movements as a result of waste generated during the construction phase will be temporary in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be imperceptible in the context of the overall traffic and transportation increase and has been addressed in Chapter 14 Traffic and Transportation. Provided the mitigation measures detailed in Chapter 14 and the requirements of the OWMP (included as Appendix 13.2) are adhered to, the effects should be **short to long-term**, **imperceptible** and **neutral**.

13.10.3 Population and Human Health

The potential impacts on human beings in relation to the generation of waste during the construction and operational phases are that incorrect management of waste could result in littering which could cause a nuisance to the public and attract vermin. A carefully planned approach to waste management and adherence to the project specific C&DWMP and OWMP, will ensure appropriate management of waste and avoid any negative impacts on the local population. ***long-term, imperceptible*** and ***neutral***.

13.11 REFERENCES

- Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate and associated legislation include:
    - European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended.
    - Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended.
    - Waste Management (Facility Permit and Registration) Regulations 2007 (S.I No. 821 of 2007) as amended.
    - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended.
    - European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014) as amended.
    - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997) as amended.
    - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
    - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
    - European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended.
    - Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended.
    - European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 430 of 2015)
    - Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended.
    - Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended.
    - The European Communities (Transfrontier Shipment of Hazardous Waste) Regulations 1988 (S.I. No. 248 of 1988)
    - European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 (S.I. No. 324 of 2011)
    - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended
- Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
- Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
- Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015).
- Department of Environment and Local Government (DoELG) Waste Management – Changing Our Ways, A Policy Statement (1998).
- Forum for the Construction Industry – Recycling of Construction and Demolition Waste.
- Department of Environment, Communities and Local Government (DoECLG), A Resource Opportunity - Waste Management Policy in Ireland (2012).



- Department of Communications, Climate Action and Environment (DCCAE), *Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025* (2020).

- Department of Environment, Heritage and Local Government, Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (2006).

- FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and Site Managers (2002).

- South Dublin County Council (SDCC), South Dublin County Council Development Plan 2016-2022 (2015)

- Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended

- EPA, Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2015)

- Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.

- Environmental Protection Agency (EPA), National Waste Database Reports 1998 – 2012.

- EPA and Galway-Mayo Institute of Technology (GMIT), EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned (2015).

- BS 5906:2005 Waste Management in Buildings – Code of Practice.

- DoEHLG, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2018).

- SDCC 'South Dublin County Council Household & Commercial Waste Bye-Laws'(2018).

APPENDIX 13.1 - CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN FOR A PROPOSED RESIDENTIAL DEVELOPMENT

awnconsulting

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

APPENDIX 13.1

CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN FOR A PROPOSED RESIDENTIAL DEVELOPMENT

AT

STOCKING AVENUE, DUBLIN 16

"WHITE PINES EAST"

Report Prepared For

Ardstone Homes Limited

Report Prepared By

Chonaill Bradley, Senior Environmental Consultant

Our Reference

CB/20/11406WMR01

Date of Issue

21 January 2021

Cork Office
Unit 5, ATS Building,
Carrigaline Industrial Estate,
Carrigaline, Co. Cork.
T: + 353 21 438 7400
F: + 353 21 483 4606

AWN Consulting Limited
Registered in Ireland No. 319812
Directors: F Callaghan, C Dilworth,
T Donnelly, T Hayes, D Kelly, E Porter

Document History

Document Reference		Original Issue Date	
CB/20/11406WMR01		21 January 2021	
Revision Level	Revision Date	Description	Sections Affected

Record of Approval

Details	Written by	Approved by
Signature		
Name	Chonaill Bradley	Elaine Neary
Title	Senior Environmental Consultant	Associate
Date	21 January 2021	21 January 2021

CONTENTS **Page**

1.0 INTRODUCTION 4
2.0 CONSTRUCTION & DEMOLITION WASTE MANAGEMENT IN IRELAND 4
2.1 National Level 4
2.2 Regional Level 5
2.3 Legislative Requirements 6
3.0 DESCRIPTION OF THE PROJECT 8
3.1 Location, Size and Scale of the Development 8
3.2 Details of the Non-Hazardous Wastes to be produced 8
3.3 Potential Hazardous Wastes to be produced 9
3.4 Main C&D Waste Categories 10
4.0 WASTE MANAGEMENT 11
4.1 Demolition Waste Generation 11
4.2 Construction Waste Generation 11
4.3 Proposed Waste Management Options 12
4.4 Tracking and Documentation Procedures for Off-Site Waste 14
5.0 ESTIMATED COST OF WASTE MANAGEMENT 15
5.1 Reuse 15
5.2 Recycling 15
5.3 Disposal 15
6.0 TRAINING PROVISIONS 15
6.1 Waste Manager Training and Responsibilities 16
6.2 Site Crew Training 16
7.0 RECORD KEEPING 16
8.0 OUTLINE WASTE AUDIT PROCEDURE 17
8.1 Responsibility for Waste Audit 17
8.2 Review of Records and Identification of Corrective Actions 17
9.0 CONSULTATION WITH RELEVANT BODIES 17
9.1 Local Authority 17
9.2 Recycling/Salvage Companies 17
10.0 REFERENCES 19

1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) has prepared this Construction & Demolition Waste Management Plan (C&D WMP) on behalf of Ardstone Homes Limited. The proposed residential development will comprise the construction of 241 no. residential units, in 5 no. apartment blocks, ranging in height from 4-6 stories, and 3 no. three storey duplex blocks in a mix of 1 and 2 bed apartments at a site located at Stocking Avenue, Ballycullen, Dublin 16, known as "White Pines East".

The purpose of this plan is to provide information necessary to ensure that the management of construction and demolition (C&D) waste at the site is undertaken in accordance with the current legal and industry standards including the *Waste Management Acts 1996 - 2011* and associated Regulations [1], *Protection of the Environment Act 2003* as amended [2], *Litter Pollution Act 1997* as amended [3] and the *Eastern-Midlands Region Waste Management Plan 2015 – 2021* [4].

In particular, this Plan aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. It also seeks to provide guidance on the appropriate collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

This C&D WMP includes information on the legal and policy framework for C&D waste management in Ireland, estimates of the type and quantity of C&D waste to be generated by the proposed development and makes recommendations for management of different waste streams.

2.0 CONSTRUCTION & DEMOLITION WASTE MANAGEMENT IN IRELAND

2.1 National Level

The Irish Government issued a policy statement in September 1998 known as *'Changing Our Ways'* [5], which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within a five year period (by 2003), with a progressive increase to at least 85% over fifteen years (i.e. 2013).

In response to the *Changing Our Ways* report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report entitled '*Recycling of Construction and Demolition Waste'* [6] concerning the development and implementation of a voluntary construction industry programme to meet the Government's objectives for the recovery of C&D waste.

In September 2020 the government released a new national policy document outlining a new action plan for Ireland and it's waste to cover the period of 2020-2025. This plan 'A Waste Action Plan for a Circular Economy' [7], was prepared in response to the 'European Green Deal' which sets a roadmap for a transition to a new economy, where climate and environmental challenges are turned into opportunities. Replacing the previous national waste management policy plan "A Resource Opportunity (2012)".

It aims to fulfil the commitment in the Programme for Government to publish and start implementing a new National Waste Action Plan. It is intended that this new national waste policy will inform and give direction to waste planning and management in Ireland over the coming years. It will be followed later this year by an All of Government Circular Economy Strategy. The policy document shifts focus away from waste disposal and moves it back up the production chain. To support the policy, regulation is already being used (Circular Economy Legislative Package) or in the pipeline (Single Use Plastics Directive). The policy document contains over 200 measures across

various waste areas including Circular Economy, Municipal Waste, Consumer Protection & Citizen Engagement, Plastics and Packaging, Construction and Demolition, Textiles, Green Public Procurement and Waste Enforcement.

The National Construction and Demolition Waste Council (NCDWC) was launched in June 2002, as one of the recommendations of the Forum for the Construction Industry, in the Task Force B4 final report. The NCDWC subsequently produced '*Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects'* [8] in July 2006 in conjunction with the then Department of the Environment, Heritage and Local Government (DoEHLG). The Guidelines outline the issues that need to be addressed at the pre-planning stage of a development all the way through to its completion. These guidelines have been followed in the preparation of this document and include the following elements:

- Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes;
- Waste disposal/recycling of C&D wastes at the site;
- Provision of training for waste manager and site crew;
- Details of proposed record keeping system;
- Details of waste audit procedures and plan; and
- Details of consultation with relevant bodies i.e. waste recycling companies, South Dublin County Council etc.

Section 3 of the Guidelines identifies thresholds above which there is a requirement for the preparation of a C&D Waste Management Plan for developments. This development requires a C&D WMP under the following criterion:

- New residential development of 10 houses or more.

Other guidelines followed in the preparation of this report include *'Construction and Demolition Waste Management – a handbook for Contractors and Site Managers'* [9] published by FÁS and the Construction Industry Federation in 2002.

These guidance documents are considered to define best practice for C&D projects in Ireland and describe how C&D projects are to be undertaken such that environmental impacts and risks are minimised and maximum levels of waste recycling are achieved.

2.2 Regional Level

The proposed development is located in the Local Authority area of South Dublin County Council (SDCC).

The *EMR Waste Management Plan 2015 – 2021* is the regional waste management plan for the SDCC area published in May 2015. Currently the EMR and other regional waste management plans are under review.

The regional plan sets out the following strategic targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €130 - €150 per tonne of waste which includes a €75 per tonne landfill levy specified in the *Waste Management (Landfill Levy) Regulations 2015.*

The *South Dublin County Council Development Plan 2016 – 2022* [10] sets out a number of objectives and actions for the South Dublin area in line with the objectives of the waste management plan.

Waste objectives and actions with a particular relevance to the proposed development are as follows:

Objectives:

- **IE5 Objective 1:** To support the implementation of the Eastern–Midlands Region Waste Management Plan 2015-2021 by adhering to overarching performance targets, policies and policy actions.
- **IE5 Objective 2:** To support waste prevention through behavioural change activities to de-couple economic growth and resource use.
- **IE5 Objective 3:** To encourage the transition from a waste management economy to a green circular economy to enhance employment and increase the value recovery and recirculation of resources.
- **IE5 Objective 8:** To secure appropriate provision for the sustainable management of waste within developments, including the provision of facilities for the storage, separation and collection of such waste.

Actions:

- Support and facilitate the separation of waste at source into organic and non-organic streams or other waste management systems that divert waste from landfill and maximise the potential for each waste type to be re-used and recycled or composted and divert organic waste from landfill, in accordance with the National Strategy on Biodegradable Waste (2006).
- Implement the objectives of the National Waste Prevention Programme at a local level with businesses, schools, householders, community groups and within the Council's own activities.
- Promote an increase in the amount of waste re-used and recycled consistent with the Regional Waste Management Plan and Waste Hierarchy and facilitate recycling of waste through adequate provision of facilities and good design in new developments.
- Implement the South Dublin Litter Management Plan 2015 - 2019.

2.3 Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the project are:

- Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate legislation includes:
    - European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011) as amended
    - Waste Management (Collection Permit) Regulations (S.I No. 820 of 2007) as amended
    - Waste Management (Facility Permit and Registration) Regulations 2007, (S.I No. 821 of 2007) as amended
    - Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended
    - Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended

  - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997)
  - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
  - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
  - European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended
  - Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009), as amended
  - European Union (Household Food Waste and Bio-waste) Regulation 2015 (S.I. No. 430 of 2015)
  - Waste Management (Hazardous Waste) Regulations, 1998 (S.I. No. 163 of 1998) as amended
  - Waste Management (Shipments of Waste) Regulations, 2007 (S.I. No. 419 of 2007) as amended
  - Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998)
  - European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)
  - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended
- Environmental Protection Act 1992 (No. 7 of 1992) as amended.
- Litter Pollution Act 1997 (No. 12 of 1997) as amended.
- Planning and Development Act 2000 (No. 30 of 2000) as amended [11].

One of the guiding principles of European waste legislation, which has in turn been incorporated into the *Waste Management Act 1996 - 2001* and subsequent Irish legislation, is the principle of *"Duty of Care"*. This implies that the waste producer is responsible for waste from the time it is generated through until its legal recycling, recovery or disposal (including its method of disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final destination, waste contractors will be employed to physically transport waste to the final destination. Following on from this is the concept of *"Polluter Pays"* whereby the waste producer is liable to be prosecuted for pollution incidents, which may arise from the incorrect management of waste produced, including the actions of any contractors engaged (e.g. for transportation and disposal/recovery/recycling of waste).

It is therefore imperative that the client ensures that the waste contractors engaged by demolition and construction contractors are legally compliant with respect to waste transportation, recycling, recovery and disposal. This includes the requirement that a contractor handle, transport and recycle/recover/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments* or a waste or IE licence granted by the EPA. The COR/permit/licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

3.0 DESCRIPTION OF THE PROJECT

3.1 Location, Size and Scale of the Development

Ardstone Homes Limited intends to apply for planning permission for a Strategic Housing Development at a site of 2.98 ha, at Stocking Avenue, Dublin 16.

The construction of 241 no. residential units, in 5 no. apartment blocks, ranging in height from 4-6 stories, and 3 no. three storey duplex blocks, which includes 93 no. 1 Bed and 148 no. 2 bed units;

- **Block A** is a 5 storey block of c. 3,902sqm comprising 40 units (20 no. 1 bed units; and 20 no. 2 bed units). Block A comprises balconies on southern, northern and western elevations;
- **Block B** is a 4 storey block of c. 2,623sqm comprising 34 units (18 no. 1 bed units; and 16 no. 2 bed units). Block B comprises balconies on southern, southern, western and eastern elevations;
- **Block C** is a 5 storey block of c. 3,804sqm comprising 43 units (21 no. 1 bed units; 22 no. 2 bed units) Block C comprises balconies on southern, eastern and western elevations;
- **Block D** is a 5 storey block of c. 4,227sqm comprising 49 no units (21 no. 1 bed units and 28 no. 2 bed units). Block D comprises balconies on southern, western and eastern elevations;
- **Block E** is a 6 storey block of c. 4,220sqm comprising 47 no units (13 no. 1 bed units and 34 no. 2 bed units). Block D comprises balconies on southern, western, eastern and northern elevations;
- 3 no. 3 storey duplex of c.2,408 sqm are also provided to the western boundary of the site, comprising 28 no. 2 bed units. Balconies and terrace space is provided to the eastern elevation.
- Residential Tenant Amenities comprising c.171sq.m is provided at ground floor level of Block A to serve all residential units, comprising; reception area, games space, residents lounge and gym space.
- A dedicated community building space comprising 552sq.m will also be provided on the ground floor of Block A.
- Provision of 204 no. on street car parking spaces
- Omission of creche as approved under SDCC Ref. SD14A/0222;
- The main vehicular access to the scheme will be from Stocking Avenue. A second new vehicular access is proposed from White Pines North to the east.
- Provision of 422 no. bicycle parking spaces;
- All other ancillary site development works to facilitate construction, site services, piped infrastructure, ESB sub-stations, plant, public lighting, bin stores, bike stores, boundary treatments and provision of public and private open space including hard and soft landscaping, plant, provision of public and private open space areas comprising hard and soft landscaping, site services all other associated site excavation, infrastructural and site development works above and below ground.

3.2 Details of the Non-Hazardous Wastes to be produced

There will be topsoil and subsoil excavated to facilitate site preparation, construction of foundations, and the installation of underground services. The volume of material to be excavated has been estimated by the project engineers to be c.10,000m^3. It is anticipated that c.7,500m^3 of excavated material will need to be removed offsite for appropriate reuse, recycling or disposal, however it is envisaged that c.2,500m^3 of topsoil will be reused onsite in landscaping and non-structural fill.

During the construction phase there may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, plastics, metals and tiles generated. There may also be excess concrete during construction which will need to be disposed of. Plastic and cardboard waste from packaging and oversupply of materials will also be generated.

Waste will also be generated from construction workers e.g. organic/food waste, dry mixed recyclables (wastepaper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided onsite during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

3.3 Potential Hazardous Wastes to be produced

3.3.1 Contaminated Soil

Site investigations were undertaken in March 2020 by IGSL Limited (IGSL). Environmental analysis was undertaken on a selection of samples collected were analysed for a suite of parameters which allows for the assessment of the soils in terms of total pollutant content for classification of materials as hazardous or non-hazardous (RILTA Suite). The suite also allows for the assessment of the soils in terms of suitability for placement at various categories of landfill. The parameter list for the RILTA suite includes analysis of the solid samples for arsenic, barium, cadmium, chromium, copper, cyanide, lead, nickel, mercury, zinc, speciated aliphatic and aromatic petroleum hydrocarbons, pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen.

If any potentially contaminated material is encountered, it will need to be segregated from clean/inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled *'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* [12] using the *HazWasteOnline* application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the *EC Council Decision 2003/33/EC* [13], which establishes the criteria for the acceptance of waste at landfills.

In total, twenty-eight (28 No.) samples were assessed using the HazWasteOnLineTM Tool. All samples were classified as being not hazardous.

In the event that Asbestos Containing Materials (ACMs) are found, the removal will only be carried out by a suitably permitted waste contractor, in accordance with *S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.* All asbestos will be taken to a suitably licensed or permitted facility.

In the event that hazardous soil, or historically deposited waste is encountered during the construction phase, the contractor will notify SDCC and provide a Hazardous/Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal/treatment, in addition to information on the authorised waste collector(s).

3.3.2 Fuel/Oils

As fuels and oils are classed as hazardous materials, any on-site storage of fuel/oil, all storage tanks and all draw-off points will be bunded (or stored in double-skinned tanks) and located in a dedicated, secure area of the site. Provided that these requirements

are adhered to and site crew are trained in the appropriate refuelling techniques, it is not expected that there will be any fuel/oil wastage at the site.

3.3.3 Japanese Knot Weed and Other Invasive Plant Species

ALTEMAR (Marine and Environmental Consultants) undertook a site assessment/survey searching directly for evidence of Japanese knotweed and other invasive species on the 16th April 2020. This included a walkover survey of the entire site, and around part of the outside perimeter. Japanese Knotweed *Fallopia japonica*, which is listed on the Third Schedule of the Birds and Habitats Regulations, was not recorded on the site.

Japanese Knotweed (*Fallopia japonica*) is an alien invasive species listed under *schedule 3 of Regulations SI No. 355/2015*. SCE's report concludes that it is not present on this site and there was no indication that it is growing in the immediate vicinity.

3.3.4 Other known Hazardous Substances

Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor.

In addition, WEEE (containing hazardous components), printer toner/cartridges, batteries (Lead, Ni-Cd or Mercury) and/or fluorescent tubes and other mercury containing waste may be generated from during C&D activities or temporary site offices. These wastes (if encountered) will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

3.4 Main C&D Waste Categories

The main non-hazardous and hazardous waste streams that could be generated by the construction and demolition activities at a typical site are shown in Table 3.1. The List of Waste (LoW) code (as effected from 1 June 2015) (also referred to as the European Waste Code or EWC) for each waste stream is also shown.

Waste Material	LoW/EWC Code
Concrete, bricks, tiles, ceramics	17 01 01-03 & 07
Wood, glass and plastic	17 02 01-03
Treated wood, glass, plastic, containing hazardous substances	17-02-04*
Bituminous mixtures, coal tar and tarred products	17 03 01*, 02 & 03*
Metals (including their alloys) and cable	17 04 01-11
Soil and stones	17 05 03* & 04
Gypsum-based construction material	17 08 01* & 02
Paper and cardboard	20 01 01
Mixed C&D waste	17 09 04
Green waste	20 02 01
Electrical and electronic components	20 01 35 & 36
Batteries and accumulators	20 01 33 & 34
Liquid fuels	13 07 01-10
Chemicals (solvents, pesticides, paints, adhesives, detergents etc.)	20 01 13, 19, 27-30
Insulation materials	17 06 04
Organic (food) waste	20 01 08

Waste Material	LoW/EWC Code
Mixed Municipal Waste	20 03 01

Table 3.1 Typical waste types generated and EWCs (individual waste types may contain hazardous substances)

4.0 WASTE MANAGEMENT

4.1 Demolition Waste Generation

There is no demolition required for this project however there is a small amount of hardstanding that will need to be excavated as part of the site ground works.

4.2 Construction Waste Generation

Table 4.1 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA *National Waste Reports, the GMIT* [15] and other research reports.

Waste Types	%
Mixed C&D	33
Timber	28
Plasterboard	10
Metals	8
Concrete	6
Other	15
Total	**100**

Table 4.1 Waste materials generated on a typical Irish construction site

Table 4.2 shows the predicted construction waste generation for the proposed development based on the information available to date along with the targets for management of the waste streams. The predicted waste amounts are based on an average large-scale development waste generation rate per m^2, using the waste breakdown rates shown in Table 4.1.

Waste Type	Tonnes	Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	415.9	10	41.6	80	332.8	10	41.6
Timber	352.9	40	141.2	55	194.1	5	17.6
Plasterboard	126.0	30	37.8	60	75.6	10	12.6
Metals	100.8	5	5.0	90	90.8	5	5.0
Concrete	75.6	30	22.7	65	49.2	5	3.8
Other	189.1	20	37.8	60	113.4	20	37.8
Total	**1260.4**		**286.1**		**855.8**		**118.5**

Table 4.2 Estimated off-site reuse, recycle and disposal rates for construction waste

In addition to the information in Table 4.2, the quantity of excavated material that will be generated has been estimated to be c. 10000 m^3. Any suitable excavated material will be temporarily stockpiled for reuse as fill or for landscaping, where possible, however it is anticipated that c. 7,500m^3 of excavated sub soil material is to be removed offsite for appropriate reuse, recovery and/or disposal.

It should be noted that until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

4.3 Proposed Waste Management Options

Waste materials generated will be segregated on site, where it is practical. Where the on-site segregation of certain wastes types is not practical, off-site segregation will be carried out. Due to space restrictions onsite, it is expected that most segregation will occur offsite at the waste contractors licensed waste facilities. There will be skips and receptacles provided to facilitate segregation at source where feasible. All waste receptacles leaving site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled. There are numerous waste contractors in the Dublin Region that provide this service.

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arisings requiring disposal off-site will be reused, recycled, recovered or disposed of at a facility holding the appropriate registration, permit or licence, as required.

Some of the sub-contractors on site will generate waste in relatively low quantities. The transportation of non-hazardous waste by persons who are not directly involved with the waste business, at weights less than or equal to 2 tonnes, and in vehicles not designed for the carriage of waste, are exempt from the requirement to have a waste collection permit (Ref. Article 30 (1) (b) of the Waste Collection Permit Regulations 2007 as amended). Any sub-contractors engaged that do not generate more than 2 tonnes of waste at any one time can transport this waste offsite in their work vehicles (which are not designed for the carriage of waste). However, they are required to ensure that the receiving facility has the appropriate COR / permit / licence.

Written records will be maintained by the contractor(s) detailing the waste arising throughout the C&D phases, the classification of each waste type, waste collection permits for all waste contactors who collect waste from the site and COR/permit or licence for the receiving waste facility for all waste removed off site for appropriate reuse, recycling, recovery and/or disposal.

Dedicated bunded storage containers will be provided for hazardous wastes which may arise such as batteries, paints, oils, chemicals etc, if required.

The management of the main waste streams is outlined as follows:

<u>Topsoil & Subsoil</u>

The Waste Management Hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling/recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The excavations are required to facilitate construction works so the preferred option (prevention and minimisation) cannot be accommodated for the excavation phase.

It is anticipated that c. 7,500 m^3 of excavated material will be taken off site. When material is removed off-site it could be reused as a by-product (and not as a waste), if this is done, it will be done in accordance with Article 27 of the *European Communities (Waste Directive) Regulations 2011*. Article 27 requires that certain conditions are met and that by-product notifications are made to the EPA via their online notification form. Excavated material should not be removed from site until approval from the EPA has

been received. It is not envisaged that article 27 will be used to export excavated material off this site.

The next option (beneficial reuse) may be appropriate for the excavated material pending environmental testing to classify the material as hazardous or non-hazardous in accordance with the EPA *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* publication. Clean inert material may be used as fill material in other construction projects or engineering fill for waste licensed sites. Beneficial reuse of surplus excavation material as engineering fill may be subject to further testing to determine if materials meet the specific engineering standards for their proposed end-use.

Any nearby sites requiring clean fill/capping material will be contacted to investigate reuse opportunities for clean and inert material. If any of the material is to be reused on another site as a by-product (and not as a waste), this will be done in accordance with Article 27. It is not envisaged that Article 27 will be used to export material off this site.

Similarly, if any soils/stones are imported onto the site from another construction site as a by-product, this will also be done in accordance with Article 27. It is not envisaged that Article 27 will be used to import material onto this site.

If the material is deemed to be a waste, then removal and reuse/recovery/disposal of the material will be carried out in accordance with the *Waste Management Acts 1996 – 2011* as amended, the *Waste Management (Collection Permit) Regulations 2007* as amended and the *Waste Management (Facility Permit & Registration) Regulations 2007* as amended. Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered.

In the event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately to any inert and/or non-hazardous material. It will require off-site treatment at a suitable facility or disposal abroad via Transfrontier Shipment of Wastes (TFS).

Bedrock

It is not anticipated that bedrock will be encountered during the excavation phase of this development.

Silt & Sludge

During the construction phase, silt and petrochemical interception should be carried out on runoff and pumped water from site works, where required. Sludge and silt will then be collected by a suitably licensed contractor and removed offsite.

Concrete Blocks, Bricks, Tiles & Ceramics

The majority of concrete blocks, bricks, tiles and ceramics generated as part of the construction and demolition works are expected to be clean, inert material and should be recycled, where possible.

Hard Plastic

As hard plastic is a highly recyclable material, much of the plastic generated will be primarily from material off-cuts. All recyclable plastic will be segregated and recycled, where possible.

Timber

Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc., will be disposed of in a separate skip and recycled off-site.

Metal
Metal will be segregated and stored in skips. Metal is highly recyclable and there are numerous companies that will accept these materials.

Plasterboard
There are currently a number of recycling services for plasterboard in Ireland. Plasterboard from the demolition and construction phases will be stored in a separate skip, pending collection for recycling. The site manager will ensure that oversupply of new plasterboard is carefully monitored to minimise waste.

Glass
Glass materials will be segregated for recycling, where possible.

Waste Electrical and Electronic Equipment (WEEE)
Any WEEE will be stored in dedicated covered cages/receptacles/pallets pending collection for recycling.

Other Recyclables
Where any other recyclable wastes such as cardboard and soft plastic are generated, these will be segregated at source into dedicated skips and removed off-site.

Non-Recyclable Waste
C&D waste which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboards, will be placed in separate skips or other receptacles. Prior to removal from site, the non-recyclable waste skip/receptacle will be examined by a member of the waste team (see Section 6.0) to determine if recyclable materials have been placed in there by mistake. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

Other Hazardous Wastes
On-site storage of any hazardous wastes produced (i.e. contaminated soil if encountered and/or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous wastes will be recovered, wherever possible, and failing this, disposed of appropriately.

4.4 Tracking and Documentation Procedures for Off-Site Waste

All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the nominated project Waste Manager (see Section 6.0).

All movement of waste and the use of waste contractors will be undertaken in accordance with the *Waste Management Acts 1996 - 2011*, *Waste Management (Collection Permit) Regulations 2007* as amended and *Waste Management (Facility Permit & Registration) Regulations 2007* and amended. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project waste manager (see Section 6.0) will maintain a copy of all waste collection permits on-site.

If the waste is being transported to another site, a copy of the Local Authority waste COR/permit or EPA Waste/IE Licence for that site will be provided to the nominated project waste manager (see Section 6.0). If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) notification document will be obtained from DCC (as the relevant authority on behalf of all local authorities in Ireland) and kept on-site

along with details of the final destination (COR, permits, licences etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records.
All information will be entered in a waste management recording system to be maintained on site.

5.0 ESTIMATED COST OF WASTE MANAGEMENT

An outline of the costs associated with different aspects of waste management is provided below.

The total cost of C&D waste management will be measured and will take into account handling costs, storage costs, transportation costs, revenue from rebates and disposal costs.

5.1 Reuse

By reusing materials on site, there will be a reduction in the transport and recycle/recovery/disposal costs associated with the requirement for a waste contractor to take the material off-site.

Clean and inert soils, gravel, stones etc. which cannot be reused on site may be used as access roads or capping material for landfill sites etc. This material is often taken free of charge or a reduced fee for such purposes, reducing final waste disposal costs.

5.2 Recycling

Salvageable metals will earn a rebate which can be offset against the costs of collection and transportation of the skips.

Clean uncontaminated cardboard and certain hard plastics can also be recycled. Waste contractors will charge considerably less to take segregated wastes, such as recyclable waste, from a site than mixed waste.

Timber can be recycled as chipboard. Again, waste contractors will charge considerably less to take segregated wastes such as timber from a site than mixed waste.

5.3 Disposal

Landfill charges in the Leinster region are currently at around €130 - €150 per tonne which includes a €75 per tonne landfill levy specified in the *Waste Management (Landfill Levy) Regulations 2015*. In addition to disposal costs, waste contractors will also charge a collection fee for skips.

Collection of segregated C&D waste usually costs less than municipal waste. Specific C&D waste contractors take the waste off-site to a licensed or permitted facility and, where possible, remove salvageable items from the waste stream before disposing of the remainder to landfill. Clean soil, rubble, etc. is also used as fill/capping material, wherever possible.

6.0 TRAINING PROVISIONS

A member of the construction team will be appointed as the project waste manager to ensure commitment, operational efficiency and accountability during the C&D phases of the project.

6.1 Waste Manager Training and Responsibilities

The nominated waste manager will be given responsibility and authority to select a waste team if required, i.e. members of the site crew that will aid them in the organisation, operation and recording of the waste management system implemented on site. The waste manager will have overall responsibility to oversee, record and provide feedback to the client on everyday waste management at the site. Authority will be given to the waste manager to delegate responsibility to sub-contractors, where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and material salvage.

The waste manager will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on site. The waste manager will also be trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and be knowledgeable in how to implement this C&D WMP.

6.2 Site Crew Training

Training of site crew is the responsibility of the waste manager and, as such, a waste training program should be organised. A basic awareness course will be held for all site crew to outline the C&D WMP and to detail the segregation of waste materials at source. This may be incorporated with other site training needs such as general site induction, health and safety awareness and manual handling.

This basic course will describe the materials to be segregated, the storage methods and the location of the Waste Storage Areas (WSAs). A sub-section on hazardous wastes will be incorporated into the training program and the particular dangers of each hazardous waste will be explained.

7.0 RECORD KEEPING

Records should be kept for all waste material which leaves the site, either for reuse on another site, recycling or disposal. A recording system will be put in place to record the waste arising's on site.

A waste tracking log should be used to track each waste movement from the site. On exit from the site the waste collection vehicle driver should stop at the site office and sign out as a visitor and provide the security personnel or waste manager with a waste docket (or WTF for hazardous waste) for the waste load collected. At this time, the security personnel should complete and sign the Waste Tracking Register with the following information:

- Date
- Time
- Waste Contractor
- Company waste contractor appointed by e.g. Contractor or subcontractor name
- Collection Permit No.
- Vehicle Reg.
- Driver Name
- Docket No.
- Waste Type
- EWC/LoW

The waste transfer dockets will be transferred to the site waste manager on a weekly basis and can be placed in the Waste Tracking Log file. This information will be forwarded onto the SDCC Waste Regulation Unit on a monthly basis

Alternatively, each subcontractor that has engaged their own waste contractor will be required to maintain a similar waste tracking log with the waste dockets/WTF maintained on file and available for inspection on site by the main contractor as required.

A copy of the Waste Collection Permits, CORs, Waste Facility Permits and Waste Licences will be maintained on site at all times. Subcontractors who have engaged their own waste contractors, should provide the main contractor with a copy of the waste collection permits and COR/permit/licence for the receiving waste facilities and maintain a copy on file available for inspection on site as required.

8.0 OUTLINE WASTE AUDIT PROCEDURE

8.1 Responsibility for Waste Audit

The appointed waste manager will be responsible for conducting a waste audit at the site during the C&D phase of the development.

Contact details for the nominated Waste Manager will be provided to the SDCC Waste Regulation Unit after the main contractor is appointed and prior to any material being removed from site.

8.2 Review of Records and Identification of Corrective Actions

A review of all the records for the waste generated and transported off-site should be undertaken mid-way through the project. If waste movements are not accounted for, the reasons for this should be established in order to see if and why the record keeping system has not been maintained. The waste records will be compared with the established recovery/reuse/recycling targets for the site.

Each material type will be examined, in order to see where the largest percentage waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how the targets can be achieved.
Waste management costs will also be reviewed.

Upon completion of the C & D phase, a final report will be prepared, summarising the outcomes of waste management processes adopted and the total recycling/reuse/recovery figures for the development.

9.0 CONSULTATION WITH RELEVANT BODIES

9.1 Local Authority

Once demolition and construction contractors have been appointed and prior to removal of any C&D waste materials offsite, details of the proposed destination of each waste stream will be provided to the SDCC Waste Regulation Unit.

SDCC will also be consulted, as required, throughout the demolition, excavation and construction phases in order to ensure that all available waste reduction, reuse and recycling opportunities are identified and utilised and that compliant waste management practices are carried out.

9.2 Recycling/Salvage Companies

Companies that specialise in C&D waste management will be contacted to determine their suitability for engagement. Where a waste contractor is engaged, each company will be audited in order to ensure that relevant and up-to-date waste collection permits

and facility COR/permits/licences are held. These permit details will be sent to the SDCC Waste Regulation Unit.

10.0 REFERENCES

1. Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate and associated legislation includes:
   - European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended.
   - Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended.
   - Waste Management (Facility Permit and Registration) Regulations 2007 (S.I No. 821 of 2007) as amended.
   - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended.
   - European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014) as amended.
   - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997) as amended.
   - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
   - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
   - European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended.
   - Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended.
   - European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 430 of 2015)
   - Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended.
   - Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended.
   - The European Communities (Transfrontier Shipment of Hazardous Waste) Regulations 1988 (S.I. No. 248 of 1988)
   - European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 (S.I. No. 324 of 2011)
   - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended
2. Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
3. Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
4. Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015).
5. Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998).
6. Forum for the Construction Industry – *Recycling of Construction and Demolition Waste.*
7. Department of Communications, Climate Action and Environment (DCCAE), *Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025* (Sept 2020).
8. Department of Environment, Heritage and Local Government, *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* (2006).
9. FÁS and the Construction Industry Federation (CIF), *Construction and Demolition Waste Management – a handbook for Contractors and Site Managers* (2002).
10. The South Dublin County Council (SDCC) *South Dublin County Council Household Waste Bye-Laws (2012).*
11. Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended
12. EPA, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2015)
13. Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
14. Environmental Protection Agency (EPA), *National Waste Database Reports 1998 – 2012*.

15. EPA and Galway-Mayo Institute of Technology (GMIT), *EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned* (2015).

APPENDIX 13.2 - OPERATIONAL WASTE MANAGEMENT PLAN FOR A PROPOSED RESIDENTIAL DEVELOPMENT

APPENDIX 13.2

OPERATIONAL WASTE MANAGEMENT PLAN FOR A PROPOSED RESIDENTIAL DEVELOPMENT

AT

STOCKING AVENUE, DUBLIN 16

"WHITE PINES EAST"

Report Prepared For

Ardstone Homes Limited

Report Prepared By

Chonaill Bradley, Senior Environmental Consultant

Our Reference

CB/20/11406WMR02

Date of Issue

21 January 2021

awnconsulting

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

Cork Office
Unit 5, ATS Building,
Carrigaline Industrial Estate,
Carrigaline, Co. Cork.
T: +353 21 438 7400
F: +353 21 483 4606

AWN Consulting Limited
Registered in Ireland No. 319812
Directors: F Callaghan, C Dilworth,
T Donnelly, E Porter
Associate Director: D Kelly

Document History

Document Reference		Original Issue Date	
CB/20/11406WMR02		21 January 2021	
Revision Level	Revision Date	Description	Sections Affected

Record of Approval

Details	Written by	Approved by
Signature		
Name	Chonaill Bradley	Elaine Neary
Title	Senior Environmental Consultant	Associate
Date	21 January 2021	21 January 2021

CONTENTS

		Page
1.0	INTRODUCTION	4
2.0	OVERVIEW OF WASTE MANAGEMENT IN IRELAND	4
2.1	National Level	4
2.2	Regional Level	5
2.3	Legislative Requirements	7
2.3.1	South Dublin County Council Waste Bye-Laws	8
2.4	Regional Waste Management Service Providers and Facilities	9
3.0	DESCRIPTION OF THE PROJECT	9
3.1	Location, Size and Scale of the Development	9
3.2	Typical Waste Categories	10
3.3	European Waste Codes	11
4.0	ESTIMATED WASTE ARISINGS	11
5.0	WASTE STORAGE AND COLLECTION	12
5.1	Waste Storage – Residential Units	13
5.2	Waste Storage – Commercial Units **Error! Bookmark not defined.**	
5.3	Waste Collection	14
5.4	Additional Waste Materials	14
5.5	Waste Storage Area Design	16
6.0	CONCLUSIONS	16
7.0	REFERENCES	18

1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) has prepared this Operational Waste Management Plan (OWMP) on behalf of Ardstone Homes Limited. The proposed residential development will comprise the construction of 241 no. residential units, in 5 no. apartment blocks, ranging in height from 4-6 stories, and 3 no. three storey duplex blocks in a mix of 1 and 2 bed apartments at a site located at Stocking Avenue, Ballycullen, Dublin 16, known as "White Pines East".

This OWMP has been prepared to ensure that the management of waste during the operational phase of the proposed residential development is undertaken in accordance with the current legal and industry standards including, the *Waste Management Act 1996 – 2011* as amended and associated Regulations [1], *Protection of the Environment Act 2003* as amended [2], *Litter Pollution Act 2003* as amended [3], the *'Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021'* [4], The South Dublin County Council *(SDCC) South Dublin County Council Household & Commercial Waste Bye-Laws (2018)* [5]. In particular, this OWMP aims to provide a robust strategy for storing, handling, collection and transport of the wastes generated at site.

This OWMP aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. The OWMP also seeks to provide guidance on the appropriate collection and transport of waste to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil or water resources). The plan estimates the type and quantity of waste to be generated from the proposed development during the operational phase and provides a strategy for managing the different waste streams.

At present, there are no specific guidelines in Ireland for the preparation of OWMPs. Therefore, in preparing this document, consideration has been given to the requirements of national and regional waste policy, legislation and other guidelines.

2.0 OVERVIEW OF WASTE MANAGEMENT IN IRELAND

2.1 National Level

The Government issued a policy statement in September 1998 titled as *'Changing Our Ways'* [6] which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. A heavy emphasis was placed on reducing reliance on landfill and finding alternative methods for managing waste. Amongst other things, Changing Our Ways stated a target of at least 35% recycling of municipal (i.e. household, commercial and non-process industrial) waste.

A further policy document *'Preventing and Recycling Waste – Delivering Change'* was published in 2002 [7]. This document proposed a number of programmes to increase recycling of waste and allow diversion from landfill. The need for waste minimisation at source was considered a priority.

This view was also supported by a review of sustainable development policy in Ireland and achievements to date, which was conducted in 2002, entitled *'Making Irelands Development Sustainable – Review, Assessment and Future Action'* [8]. This document also stressed the need to break the link between economic growth and waste generation, again through waste minimisation and reuse of discarded material.

In order to establish the progress of the Government policy document *Changing Our Ways*, a review document was published in April 2004 entitled *'Taking Stock and Moving Forward'* [9]. Covering the period 1998 – 2003, the aim of this document was to

assess progress to date with regard to waste management in Ireland, to consider developments since the policy framework and the local authority waste management plans were put in place, and to identify measures that could be undertaken to further support progress towards the objectives outlined in *Changing Our Ways*.

In particular, *Taking Stock and Moving Forward* noted a significant increase in the amount of waste being brought to local authority landfills. The report noted that one of the significant challenges in the coming years was the extension of the dry recyclable collection services.

In September 2020 the government released a new national policy document outlining a new action plan for Ireland and it's waste to cover the period of 2020-2025. This plan *'A Waste Action Plan for a Circular Economy'* [10] was prepared in response to the 'European Green Deal' which sets a roadmap for a transition to a new economy, where climate and environmental challenges are turned into opportunities. Replacing the previous national waste management plan *"A Resource Opportunity (2012)".*

It aims to fulfil the commitment in the Programme for Government to publish and start implementing a new National Waste Action Plan. It is intended that this new national waste policy will inform and give direction to waste planning and management in Ireland over the coming years. It will be followed later this year by an All of Government Circular Economy Strategy. The policy document shifts focus away from waste disposal and moves it back up the production chain. To support the policy, regulation is already being used (Circular Economy Legislative Package) or in the pipeline (Single Use Plastics Directive). The policy document contains over 200 measures across various waste areas including Circular Economy, Municipal Waste, Consumer Protection & Citizen Engagement, Plastics and Packaging, Construction and Demolition, Textiles, Green Public Procurement and Waste Enforcement.

Since 1998, the Environmental Protection Agency (EPA) has produced periodic *'National Waste (Database) Reports'* [11] detailing among other things estimates for household and commercial (municipal) waste generation in Ireland and the level of recycling, recovery and disposal of these materials. The 2018 National Waste Statistics, which is the most recent study published, along with national waste statistics web resource (August 2020) reported the following key statistics for 2018:

- **Generated –** Ireland produced 2,912,353 t of municipal waste in 2018, this is almost a five percent increase since 2017. This means that each person living in Ireland generated 600kg of municipal waste in 2018;
- **Managed –** Waste collected and treated by the waste industry. In 2018, a total of 2,865,207 t of municipal waste was managed and treated;
- **Unmanaged –**Waste that is not collected or brought to a waste facility and is therefore likely to cause pollution in the environment because it is burned, buried or dumped. The EPA estimates that 47,546 t was unmanaged in 2018;
- **Recovered –** the amount of waste recycled, used as a fuel in incinerators, or used to cover landfilled waste. In 2018, around 85% of municipal waste was recovered, this is an increase from 77% in 2018;
- **Recycled –** the waste broken down and used to make new items. Recycling also includes the breakdown of food and garden waste to make compost. The recycling rate in 2018 was 38%, which is down from 41% in 2018; and
- **Disposed –** Less than a quarter (15%) of municipal waste was landfilled in 2018, this is a decrease from 23% in 2018.

2.2 Regional Level

The proposed development is located in the Local Authority area of South Dublin County Council (SDCC).

The *EMR Waste Management Plan 2015 – 2021* is the regional waste management plan for the SDCC area published in May 2015.

The regional plan sets out the following strategic targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €130 - €150 per tonne of waste which includes a €75 per tonne landfill levy specified in the *Waste Management (Landfill Levy) Regulations 2015.*

The *South Dublin County Council Development Plan 2016 – 2022* [12] sets out a number of objectives and actions for the South Dublin area in line with the objectives of the waste management plan.

Waste objectives and actions with a particular relevance to the proposed development are as follows:

Objectives:

- **IE5 Objective 1:** To support the implementation of the Eastern–Midlands Region Waste Management Plan 2015-2021 by adhering to overarching performance targets, policies and policy actions.
- **IE5 Objective 2:** To support waste prevention through behavioural change activities to de-couple economic growth and resource use.
- **IE5 Objective 3:** To encourage the transition from a waste management economy to a green circular economy to enhance employment and increase the value recovery and recirculation of resources.
- **IE5 Objective 8:** To secure appropriate provision for the sustainable management of waste within developments, including the provision of facilities for the storage, separation and collection of such waste.

Actions:

- Support and facilitate the separation of waste at source into organic and non-organic streams or other waste management systems that divert waste from landfill and maximise the potential for each waste type to be re-used and recycled or composted and divert organic waste from landfill, in accordance with the National Strategy on Biodegradable Waste (2006).
- Implement the objectives of the National Waste Prevention Programme at a local level with businesses, schools, householders, community groups and within the Council's own activities.
- Promote an increase in the amount of waste re-used and recycled consistent with the Regional Waste Management Plan and Waste Hierarchy and facilitate recycling of waste through adequate provision of facilities and good design in new developments.
- Implement the South Dublin Litter Management Plan 2015 - 2019.

2.3 Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the project are:

- Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate and associated legislation includes:
  - European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended
  - Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended
  - Waste Management (Facility Permit and Registration) Regulation 2007 (S.I No. 821 of 2007) as amended
  - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended
  - European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014) as amended.
  - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997) as amended
  - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
  - European Communities (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
  - Waste Management (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended
  - Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended
  - European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 430 of 2015)
  - Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended
  - Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended
  - *European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)*
  - European Union (Properties of Waste Which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended
- Environmental Protection Act 1992 (S.I. No. 7 of 1992) as amended;
- Litter Pollution Act 1997 (Act No. 12 of 1997) as amended and
- Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended [13]

These Acts and subordinate Regulations enable the transposition of relevant European Union Policy and Directives into Irish law.

One of the guiding principles of European waste legislation, which has in turn been incorporated into the *Waste Management Act 1996 - 2011* and subsequent Irish legislation, is the principle of *"Duty of Care"*. This implies that the waste producer is responsible for waste from the time it is generated through until its legal disposal (including its method of disposal.) As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final disposal area, waste contractors will be employed to physically transport waste to the final waste disposal site.

It is therefore imperative that the residents and the facilities management company undertake on-site management of waste in accordance with all legal requirements and employ suitably permitted/licenced contractors to undertake off-site management of their waste in accordance with all legal requirements. This includes the requirement that a waste contactor handle, transport and reuse/recover/recycle/dispose of waste in

a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007* as amended or a waste or IED (Industrial Emissions Directive) licence granted by the EPA. The COR/permit/licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

2.3.1 South Dublin County Council Waste Bye-Laws

The SDCC *"County of South Dublin (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws (2018)"* came into effect in December 2018. These Bye-laws repeal the previous SDCC bye-laws*; South Dublin County Council Household Waste Bye-Laws 2012* and *South Dublin County Council (Storage, Separation at Source, Presentation and Collection of Commercial Waste) Bye-Laws 2007*. The Bye-Laws set a number of enforceable requirements on waste holders and collectors with regard to storage, separation, presentation and collection of waste within the SDCC functional area. Key requirements under these Bye-laws are:

- Kerbside waste presented for collection shall not be presented for collection earlier than 8.00pm on the day immediately preceding the designated waste collection day;
- All containers used for the presentation of kerbside waste and any uncollected waste shall be removed from any roadway, footway, footpath or any other public place no later than 8:00am on the day following the designated waste collection day;
- Neither recyclable household kerbside waste nor food waste arising from households shall be contaminated with any other type of waste before or after it has been segregated; and
- A management company, or another person if there is no such company, who exercises control and supervision of residential and/or commercial activities in multi-unit developments, mixed-use developments, flats or apartment blocks, combined living/working spaces or other similar complexes shall ensure that:
    - separate receptacles of adequate size and number are provided for the proper segregation, storage and collection of recyclable household kerbside waste and residual household kerbside waste;
    - additional receptacles are provided for the segregation, storage and collection of food waste where this practice is a requirement of the national legislation on food waste;
    - the receptacles referred to in paragraphs (a) and (b) are located both within any individual apartment and at the place where waste is stored prior to its collection;
    - any place where waste is to be stored prior to collection is secure, accessible at all times by tenants and other occupiers and is not accessible by any other person other than an authorised waste collector,
    - written information is provided to each tenant or other occupier about the arrangements for waste separation, segregation, storage and presentation prior to collection; and
    - an authorised waste collector is engaged to service the receptacles referred to in this section of these bye-laws, with documentary evidence, such as receipts, statements or other proof of payment, demonstrating the existence of this engagement being retained for a period of no less

than two years. Such evidence shall be presented to an authorised person within a time specified in a written request from either that person or from another authorised person employed by South Dublin County Council.

- The full text of the Waste Bye-Laws is available from the SDCC website

2.4 Regional Waste Management Service Providers and Facilities

Various contractors offer waste collection services for the residential and commercial sectors in the SDCC region. Details of waste collection permits (granted, pending and withdrawn) for the region are available from the NWCPO.

As outlined in the regional waste management plan, there is a decreasing number of landfills available in the region. Only three municipal solid waste landfills remain operational and are all operated by the private sector. There are a number of other licensed and permitted facilities in operation in the region including waste transfer stations, hazardous waste facilities and integrated waste management facilities. There are two existing thermal treatment facilities, one in Duleek, Co. Meath and a second facility in Poolbeg in Dublin.

There is a SDCC civic amenity c. 5.5km to the north east of the development, which can be utilised by the residents of the development for certain household waste streams. This centre can accept batteries, metal cans, beverage cartons, car batteries, paper and cardboard, clothes and textiles, electrical waste, fluorescent tubes, glass bottles and jars, green waste, metal, mobile phone, plastic bottles, plastic film, print cartridges, used gas cylinders, waste oil, white polystyrene and wood. There is also a bring bank c. 1.9km m to the north west at the Firhouse Community Centre where glass and textiles can be deposited.

A copy of all CORs and waste permits issued by the Local Authorities are available from the NWCPO website and all waste/IE licenses issued are available from the EPA.

3.0 DESCRIPTION OF THE PROJECT

3.1 Location, Size and Scale of the Development

Ardstone Homes Limited intends to apply for planning permission for a Strategic Housing Development at a site of 2.98 ha, at Stocking Avenue, Dublin 16.

The construction of 241 no. residential units, in 5 no. apartment blocks, ranging in height from 4-6 stories, and 3 no. three storey duplex blocks, which includes 93 no. 1 Bed and 148 no. 2 bed units;

- **Block A** is a 5 storey block of c. 3,902sqm comprising 40 units (20 no. 1 bed units; and 20 no. 2 bed units). Block A comprises balconies on southern, northern and western elevations;
- **Block B** is a 4 storey block of c. 2,623sqm comprising 34 units (18 no. 1 bed units; and 16 no. 2 bed units). Block B comprises balconies on southern, southern, western and eastern elevations;
- **Block C** is a 5 storey block of c. 3,804sqm comprising 43 units (21 no. 1 bed units; 22 no. 2 bed units) Block C comprises balconies on southern, eastern and western elevations;
- **Block D** is a 5 storey block of c. 4,227sqm comprising 49 no units (21 no. 1 bed units and 28 no. 2 bed units). Block D comprises balconies on southern, western and eastern elevations;

- **Block E** is a 6 storey block of c. 4,220sqm comprising 47 no units (13 no. 1 bed units and 34 no. 2 bed units). Block D comprises balconies on southern, western, eastern and northern elevations;
- 3 no. 3 storey duplex of c.2,408 sqm are also provided to the western boundary of the site, comprising 28 no. 2 bed units. Balconies and terrace space is provided to the eastern elevation.
- Residential Tenant Amenities comprising c.171sq.m is provided at ground floor level of Block A to serve all residential units, comprising; reception area, games space, residents lounge and gym space.
- A dedicated community building space comprising 552sq.m will also be provided on the ground floor of Block A.
- Provision of 204 no. on street car parking spaces
- Omission of creche as approved under SDCC Ref. SD14A/0222;
- The main vehicular access to the scheme will be from Stocking Avenue. A second new vehicular access is proposed from White Pines North to the east.
- Provision of 422 no. bicycle parking spaces;
- All other ancillary site development works to facilitate construction, site services, piped infrastructure, ESB sub-stations, plant, public lighting, bin stores, bike stores, boundary treatments and provision of public and private open space including hard and soft landscaping, plant, provision of public and private open space areas comprising hard and soft landscaping, site services all other associated site excavation, infrastructural and site development works above and below ground.

3.2 Typical Waste Categories

The typical non-hazardous and hazardous wastes that will be generated at the proposed development will include the following:

- Dry Mixed Recyclables (DMR) - includes waste paper (including newspapers, magazines, brochures, catalogues, leaflets), cardboard and plastic packaging, metal cans, plastic bottles, aluminium cans, tins and Tetra Pak cartons;
- Organic waste – food waste and green waste generated from internal plants/flowers;
- Glass; and
- Mixed Non-Recyclable (MNR)/General Waste.

In addition to the typical waste materials that will be generated at the development on a daily basis, there will be some additional waste types generated in small quantities which will need to be managed separately including:

- Green/garden waste may be generated from internal plants or external landscaping;
- Batteries (both hazardous and non-hazardous);
- Waste electrical and electronic equipment (WEEE) (both hazardous and non-hazardous);
- Printer cartridges/toners;
- Chemicals (paints, adhesives, resins, detergents, etc.) ;
- Lightbulbs;
- Textiles (rags);
- Waste cooking oil (if any generated by the residents or commercial tenants);
- Furniture (and from time to time other bulky wastes); and
- Abandoned bicycles.

Wastes should be segregated into the above waste types to ensure compliance with waste legislation and guidance while maximising the re-use, recycling and recovery of waste with diversion from landfill wherever possible.

3.3 European Waste Codes

In 1994, the *European Waste Catalogue* [14] and *Hazardous Waste List* [15] were published by the European Commission. In 2002, the EPA published a document titled the *European Waste Catalogue and Hazardous Waste List* [16], which was a condensed version of the original two documents and their subsequent amendments. This document has recently been replaced by the EPA '*Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* [17] which became valid from the 1st June 2015. This waste classification system applies across the EU and is the basis for all national and international waste reporting, such as those associated with waste collection permits, COR's, permits and licences and EPA National Waste Database.

Under the classification system, different types of wastes are fully defined by a code. The List of Waste (LoW) code (also referred to as European Waste Code or EWC) for typical waste materials expected to be generated during the operation of the proposed development are provided in Table 3.1 below.

Waste Material	LoW/EWC Code
Paper and Cardboard	20 01 01
Plastics	20 01 39
Metals	20 01 40
Mixed Non-Recyclable Waste	20 03 01
Glass	20 01 02
Biodegradable Kitchen Waste	20 01 08
Oils and Fats	20 01 25
Textiles	20 01 11
Batteries and Accumulators*	20 01 33* - 34
Printer Toner/Cartridges*	20 01 27* - 28
Green Waste	20 02 01
WEEE*	20 01 35*-36
Chemicals (solvents, pesticides, paints & adhesives, detergents, etc.) *	20 01 13*/19*/27*/28/29*30
Fluorescent tubes and other mercury containing waste*	20 01 21*
Bulky Wastes	20 03 07

** Individual waste type may contain hazardous materials*
Table 3.1 Typical Waste Types Generated and LoW Codes

4.0 ESTIMATED WASTE ARISINGS

A waste generation model (WGM) developed by AWN, has been used to predict waste types, weights and volumes arising from operations within the proposed development. The WGM incorporates building area and use and combines these with other data including Irish and US EPA waste generation rates.

The estimated quantum/volume of waste that will be generated from the residential units has been determined based on the predicted occupancy of the units. The waste generation for the commercial units is based on waste generation rates per m^2 floor area for the proposed area uses.

The estimated waste generation for the development for the main waste types is presented in Table 4.1 and 4.2.

Waste type	Waste Volume (m^3/week)			
	Residential Block A	Residential Block B	Residential Block C	Residential Block D
Organic Waste	0.57	0.48	0.62	0.74
DMR	4.06	3.41	4.38	5.23
Glass	0.11	0.09	0.12	0.14
MNR	2.13	1.79	2.30	2.75
Total	**6.87**	**5.78**	**7.42**	**8.86**

Table 4.1 Estimated waste generation for the proposed development for the main waste types

Waste type	Waste Volume (m^3/week)	
	Residential Block E	Duplex Units (Combined)
Organic Waste	0.72	0.50
DMR	5.13	3.56
Glass	0.14	0.10
MNR	2.70	1.87
Total	**8.69**	**6.02**

Table 4.2 Estimated waste generation for the proposed development for the main waste type

The BS5906:2005 Waste Management in Buildings – Code of Practice [18] was considered in the estimations of the waste arising. The predicted total waste generated from the residential units based on the Code of Practice is c. 35.72m^3 per week for the residential units. Whereas the AWN waste generation model estimates c. 45.73m^3 per week from the residential units. AWN's modelling methodology is based on data from recent published data and data from numerous other similar developments in Ireland and based on AWN's experience it is a more representative estimate of the likely waste arisings from the development.

5.0 WASTE STORAGE AND COLLECTION

This section provides information on how waste generated within the development will be stored and how the waste will be collected from the development. This has been prepared with due consideration of the proposed site layout as well as best practice standards, local and national waste management requirements including those of SDCC. In particular, consideration has been given to the following documents:

- BS 5906:2005 Waste Management in Buildings – Code of Practice,
- EMR Waste Management Plan 2015 – 2021;
- SDCC 'County of South Dublin (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws' (2018); and
- DoEHLG, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (section 4.8-4.9) (2018) [19].

Six dedicated shared Waste Storage Areas (WSAs) have been allocated within the development design for the residential units in the apartments and own door duplex units. The shared residential WSAs are located on the ground floor of Blocks A, C, D and E in close proximity to the access cores, while the WSAs for the duplex units are located on the North and South sides of the central block. All locations of the WSAs can viewed on the drawings submitted with planning.

The waste receptacles from the shared WSAs will be collected directly from the WSAs by facilities management or the waste contractor and taken to the curb for emptying, waste receptacles will be promptly returned to the WSAs.

Using the estimated waste generation volumes in Table 4.1 and 4.2 the waste receptacle requirements for MNR, DMR, organic waste and glass have been established for the WSAs. These are presented in Table 5.1.

Area/Use	Bins Required			
	MNR*	DMR**	Organic	Glass
Residential Block A & B	4 x 1100L	8 x 1100L	5 x 240L	1 x 240L
Residential Block C	2 x 1100L	4 x 1100L	3 x 240L	1 x 240L
Residential Block D	3 x 1100L	5 x 1100L	3 x 240L	1 x 240L
Residential Block E	3 x 1100L	5 x 1100L	3 x 240L	1 x 240L
Duplex Units (Combined)	2 x 1100L	4 x 1100L	2 x 240L	2 x 240L

Note: ** = Mixed Non-Recyclables*
*** = Dry Mixed Recyclables*

Table 5.1 Waste storage requirements for the proposed development

The waste receptacle requirements have been established from distribution of the total weekly waste generation estimate into the holding capacity of each receptacle type.

Waste storage receptacles as per Table 5.1 above (or similar appropriate approved containers) will be provided by the facilities management company in the residential and commercial WSAs.

The types of bins used will vary in size, design and colour dependent on the appointed waste contractor. However, examples of typical receptacles to be provided in the WSAs are shown in Figure 5.1. All waste receptacles used will comply with the IS EN 840 2012 standard for performance requirements of mobile waste containers, where appropriate.



Figure 5.1 Typical waste receptacles of varying size (240L and 1100L)

5.1 Waste Storage – Residential Units

Residents will be required to segregate waste into the following main waste streams:

- DMR;
- MNR;
- Organic waste; and
- Glass.

Space will be provided in the residential units to accommodate 3 no. bins to facilitate waste segregation at source.

Residents will be required to take their segregated waste materials to their designated residential WSA and dispose of their segregated waste into the appropriate bins. Locations of all WSAs can found on the plans submitted with the application.

Each bin/container in the WSAs will be clearly labelled and colour coded to avoid cross contamination of the different waste streams. Signage will be posted above or on the bins to show exactly which waste types can be placed in each bin.

Access to the shared residential WSAs will be restricted to authorised residents, facilities management and waste contractors by means of a key or electronic fob access. Using the estimated figures in Table 4.1, DMR, MNR, organic waste and glass will be collected on a weekly basis.

Other waste materials such as textiles, batteries, printer toner/cartridges and WEEE may be generated infrequently by the residents. Residents will be required to identify suitable temporary storage areas for these waste items within their own units and dispose of them appropriately. Further details on additional waste types can be found in Section 5.3.

5.2 Waste Collection

There are numerous private contractors that provide waste collection services in the South Dublin area. All waste contractors servicing the proposed development must hold a valid waste collection permit for the specific waste types collected. All waste collected must be transported to registered/permitted/licensed facilities only.

All residential waste from shared WSAs, requiring collection by the appointed waste contractor will be collected from the WSA by the waste contractor or facilities management. Receptacles will be bought to the curb for collection as close as possible to the collection time. Residents in the mews will be responsible for taking their bins to the curb for collection.

The facility management or waste contractor and residents in the mews (depending on the agreement) will ensure that empty bins are promptly returned to the WSAs after collection/emptying.

It is recommended that bin collection times/days are staggered to reduce the number of bins required to be emptied at once and the time the waste vehicle is onsite. This will be determined during the process of appointment of a waste contractor.

5.3 Additional Waste Materials

In addition to the typical waste materials that are generated on a daily basis, there will be some additional waste types generated from time to time that will need to be managed separately. A non-exhaustive list is presented below.

Green waste

Green waste may be generated from external landscaping and internal plants/flowers. Green waste generated from landscaping of external areas will be removed by external landscape contractors. Green waste generated from gardens internal plants/flowers can be placed in the organic waste bins.

Batteries

A take-back service for waste batteries and accumulators (e.g. rechargeable batteries) is in place in order to comply with the Waste Management Batteries and Accumulators Regulations 2014 as amended. In accordance with these regulations consumers are able to bring their waste batteries to their local civic amenity centre or can return them free of charge to retailers which supply the equivalent type of battery, regardless of whether or not the batteries were purchased at the retail outlet and regardless of whether or not the person depositing the waste battery purchases any product or products from the retail outlet.

Waste Electrical and Electronic Equipment (WEEE)

The *WEEE Directive 2002/96/EC* and associated Waste Management (WEEE) Regulations have been enacted to ensure a high level of recycling of electronic and electrical equipment. In accordance with the regulations, consumers can bring their waste electrical and electronic equipment to their local recycling centre. In addition consumers can bring back WEEE within 15 days to retailers when they purchase new equipment on a like for like basis. Retailers are also obliged to collect WEEE within 15 days of delivery of a new item, provided the item is disconnected from all mains, does not pose a health and safety risk and is readily available for collection.

Printer Cartridge/Toners

Waste printer cartridge/toners generated by residents can usually be returned to the supplier free of charge or can be brought to a civic amenity centre.

Chemicals (solvents, paints, adhesives, resins, detergents etc)

Chemicals (such as solvents, paints etc) are largely generated from building maintenance works. Such works are usually completed by external contractors who are responsible for the off-site removal and appropriate recovery/recycling/disposal of any waste materials generated.

Any waste cleaning products or waste packaging from cleaning products that are classed as hazardous (if they arise) generated by the residents should be brought to a civic amenity centre.

Light Bulbs (Fluorescent Tubes, Long Life, LED and Lilament bulbs)

Waste light bulbs may be generated from building maintenance works. Such works are usually completed by external contractors or facilities management who are responsible for the off-site removal and appropriate recovery/recycling/disposal of any waste materials generated.

Light bulbs generated by residents should be taken to the nearest civic amenity centre for appropriate storage and recovery/disposal.

Textiles

Where possible, waste textiles should be recycled or donated to a charity organisation for reuse.

Waste Cooking Oil

If the residents generate waste cooking oil, this can be brought to a civic amenity centre.

Furniture (and other bulky wastes)

Furniture and other bulky waste items (such as carpet etc.) may occasionally be generated by the residents. If residents wish to dispose of furniture, this can be brought a civic amenity centre.

Abandoned Bicycles

Bicycle parking areas are planned for the development. As happens in other developments, residents sometimes abandon faulty or unused bicycles and it can be difficult to determine their ownership. Abandoned bicycles should be donated to charity if they arise

Covid-19 Waste

Any waste generated by residents/staff of the development that have tested positive for Covid-19 should be manged in accordance with the current Covid-19 HSE Guidelines at the time that that waste arises. At the time this report was prepared, the HSE Guidelines require the following procedure for any waste from a person that tests positive for Covid-19:

- Put all waste (gloves, tissues, wipes, masks) from that person in a bin bag and tie when almost full;
- Put this bin bag into a second bin bag and tie a knot;
- Store this bag safely for 3 days, then put the bag into the non-recyclable waste/general waste wheelie bin for collection/emptying.

Please note that this guidance is likely to be updated by the time the development is open and occupied and the relevant guidance at the time will need to be reviewed.

5.4 Waste Storage Area Design

The residential WSAs should be designed and fitted-out to meet the requirements of relevant design standards, including:

- Be fitted with a non-slip floor surface;
- Provide ventilation to reduce the potential for generation of odours;
- Provide suitable lighting – a minimum Lux rating of 220 is recommended;
- Appropriate sensor controlled lighting;
- Be easily accessible for people with limited mobility;
- Be restricted to access by nominated personnel only;
- Be supplied with hot or cold water for disinfection and washing of bins;
- Be fitted with suitable power supply for power washers;
- Have a sloped floor to a central foul drain for bins washing run-off;
- Have appropriate graphical and written signage placed above and on bins indicating correct use;
- Have access for potential control of vermin, if required;
- Robust design of doors to bin area incorporating steel sheet covering where appropriate; and
- Be fitted with CCTV for monitoring.

The facilities company will be required to maintain the waste storage areas in good condition as required by the SDCC Waste Bye-Laws.

6.0 CONCLUSIONS

In summary, this OWMP presents a waste strategy that complies with all legal requirements, waste policies and best practice guidelines and demonstrates that the required storage areas have been incorporated into the design of the development.

Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce

waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the *EMR Waste Management Plan 2015 – 2021*.

Adherence to this plan will also ensure that waste management at the development is carried out in accordance with the requirements of the *SDCC Waste Bye-Laws.*

The waste strategy presented in this document will provide sufficient storage capacity for the estimated quantity of segregated waste. The designated area for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy.

7.0 REFERENCES

1. Waste Management Act 1996 (S.I. No. 10 of 1996) as amended. Sub-ordinate and associated legislation includes:
    - European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended
    - Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended
    - Waste Management (Facility Permit and Registration) Regulations 2007 (S.I No. 821 of 2007) as amended
    - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended
    - European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014)
    - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997)
    - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
    - European Communities (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
    - Waste Management (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended
    - Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended 2015 (S.I. No. 430 of 2015)
    - European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 191 of 2015)
    - Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended 2000 (S.I. No. 73 of 2000)
    - Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended
    - *European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)*
    - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended.
2. Environmental Protection Act 1992 (Act No. 7 of 1992) as amended;
3. Litter Pollution Act 1997 (Act No. 12 of 1997) as amended;
4. Eastern-Midlands Waste Region, *Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021* (2015)
5. The South Dublin County (SDCC) *'South Dublin County Council Household & Commercial Waste Bye-Laws'(2018).*
6. Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998)
7. Department of Environment, Heritage and Local Government (DoEHLG) *Preventing and Recycling Waste - Delivering Change* (2002)
8. DoELG, *Making Ireland's Development Sustainable – Review, Assessment and Future Action (World Summit on Sustainable Development)* (2002)
9. DoEHLG, *Taking Stock and Moving Forward* (2004)
10. Department of Communications, Climate Action and Environment (DCCAE), *Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025* (2020).
11. Environmental Protection Agency (EPA), *National Waste Database Reports 1998 – 2012*.
12. SDCC*, South Dublin County Development Plan 2016 – 2022* (2016)
13. Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended 2010 (S.I. No. 30 of 2010) and 2015 (S.I. No. 310 of 2015).
14. European Waste Catalogue - Council Decision 94/3/EC (as per Council Directive 75/442/EC).
15. Hazardous Waste List - Council Decision 94/904/EC (as per Council Directive 91/689/EEC).
16. EPA, *European Waste Catalogue and Hazardous Waste List* (2002)

17. EPA, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2015)
18. BS 5906:2005 Waste Management in Buildings – Code of Practice.
19. DoEHLG, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2018).

14.0 TRAFFIC AND TRANSPORTATION

14.1 Introduction

This section of the report assesses and evaluates the likely impact of the proposed development on the existing Traffic and Transportation environment in the vicinity of the site, as well as identifying proposed mitigation measures to minimise any identified impacts arising from the residential development at Stocking Avenue, Dublin 16, Co. Dublin.

The scope of this assessment covers transport and sustainability issues including access, pedestrian, cyclist and public transport connections. Recommendations contained within this chapter are based on existing and proposed road layout plans, on site traffic observations and junction vehicle turning count data. Traffic surveys were commissioned specifically for this assessment with the objective of providing background information relating to the existing traffic movement patterns across the local road network.

This chapter was prepared by Daniel Garvey BEng (Hons) and reviewed by Mark Kelly BA BAI MSc CEng MIEI of DBFL Consulting Engineers. Mark is a Chartered Transportation Engineer with DBFL Consulting Engineers with over 7 years' experience working in the areas of traffic engineering and transport planning, with considerable knowledge and experience in strategic transport planning and sustainable travel. Daniel is a Graduate Transportation Engineer with DBFL Consulting Engineers and has been involved in the assessment and preparation of traffic and transport assessments pertaining to several residential and mixed use developments.

In summary, the proposed residential development comprises of 241 no. residential units, in 5 no. apartment blocks, ranging in height from 4-6 stories, and 3 no. three storey duplex blocks, which includes 93 no. 1 Bed and 148 no. 2 bed units and a community centre of approx. 552 sqm.

This assessment of traffic and transportation was carried out in accordance with the following guidance and established best practice, and was tailored accordingly based on professional judgement and local circumstance:

- Environmental Protection Agency (EPA) Guidelines on the Information to be contained in the Environmental Impact Assessment Reports (EPA, 2017) and will follow all future revisions or finalised EIA guidelines as appropriate; and
- Transport Infrastructure Ireland (TII) (formerly the National Roads Authority) Traffic and Transportation Assessment Guidelines.

14.2 Methodology

The approach to the study accords with policy and guidance at EU, national and local level. Accordingly, the adopted methodology responds to best practices, current and emerging guidance, exemplified by a series of publications, all of which advocate this method of analysis. Key publications consulted include:

- *'Traffic and Transport Assessment Guidelines'* (May 2014) National Road Authority;
- *'Traffic Management Guidelines'* Dublin Transportation Office & Department of the Environment and Local Government (May 2003);

- *'Guidelines for Traffic Impact Assessments'*, The Institution of Highways and Transportation (1994); and
- *'South Dublin County Development Plan 2016 - 2022'*.

The methodology employed, incorporated a number of key inter-related stages, including:

- **Site Audit:** A site audit was undertaken to quantify existing road network issues and identify local infrastructure characteristics, in addition to establishing the level of accessibility to the site in terms of walking, cycling and public transport. An inventory of the local road network was also developed during this stage of the assessment.
- **Traffic Counts:** Junction traffic counts were undertaken and analysed with the objective of establishing local traffic characteristics in the immediate area of the proposed residential development.
- **Trip Generation:** A trip generation exercise has been carried out to establish the potential level of vehicle trips generated by the proposed residential development.
- **Trip Distribution:** Based upon both the existing traffic characteristics and the anticipated travel patterns of the proposed residential development, a distribution exercise has been undertaken to assign site generated vehicle trips across the local road network.
- **Network Analysis:** Further to quantifying the predicted impact of vehicle movements across the local road network for the adopted optimum site access strategy, more detailed computer simulations have been undertaken to assess the operational performance of key junctions in the post development 2022, 2027 and 2037 development scenarios.

14.3 Receiving Environment

14.3.1 Location

The subject site is located on a greenfield area within the Woodtown suburb of South Dublin and lies within the Ballycullen-Oldcourt Local Area Plan (LAP) lands. The subject site predominantly comprises greenfield site and is zoned as Objective RES-N.

The subject site is located approximately 11km south-west of Dublin City Centre, 5km south-east from Tallaght Town Centre and offers good access to the M50 Motorway, via Junction 12, located to the north-west of the site. The subject site is bound to the south by Stocking Avenue and to the west by the residential development of White Pines Way. The site is situated in close proximity to the established residential area of Stocking Wood and Stocking Well to the west as well as Woodstown Village and Knocklyon which is approximately 1.8km north-west of the development site.

The general location of the subject site in relation to the surrounding road network is illustrated below in **Figure 14.1**, while **Figure 14.2** indicatively shows the extent of the subject site boundary and neighbouring lands.

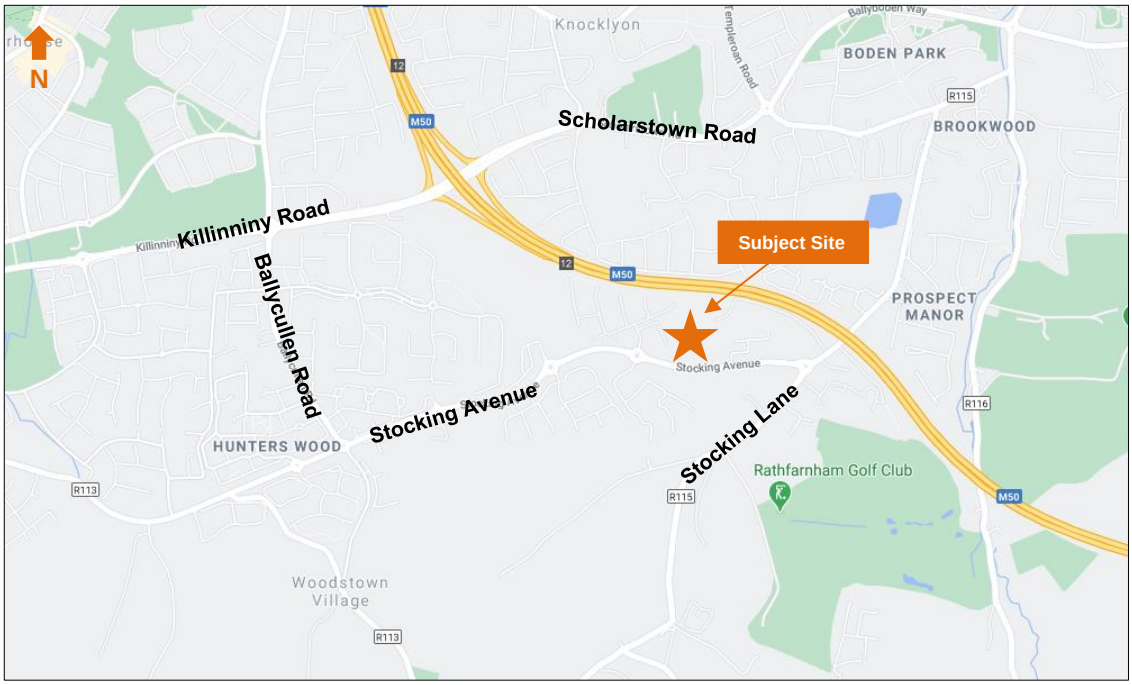


Figure 14.1: Approximate Site Location (Source: www.google.ie/maps)

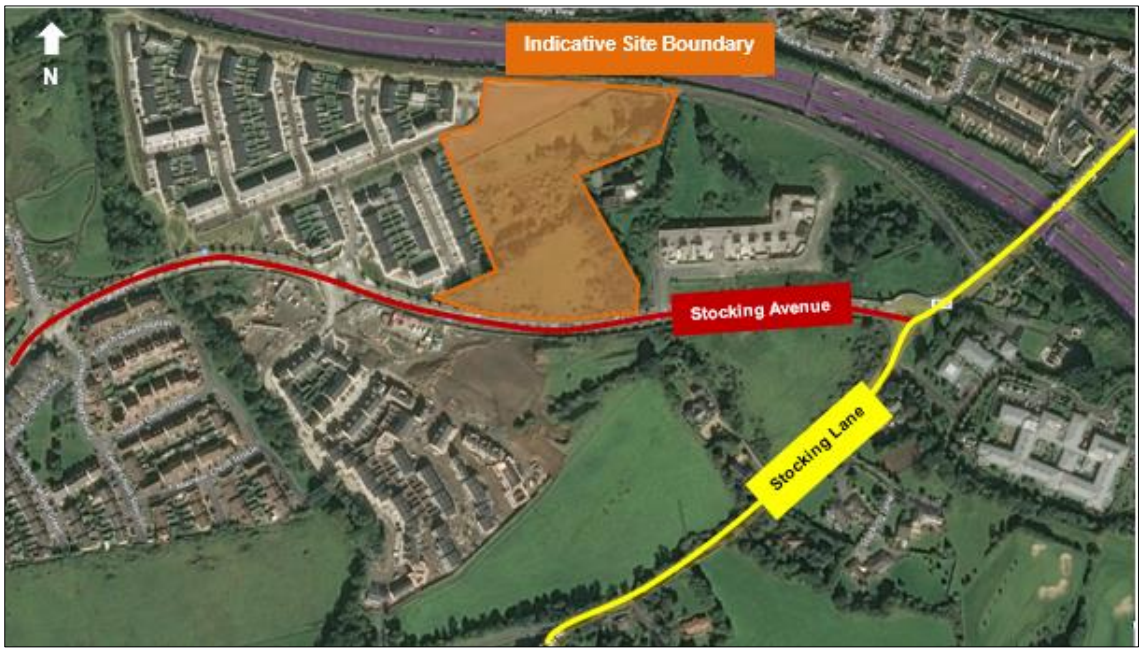


Figure 14.2: Indicative Site Boundary (Source: Bing Maps)

14.3.2 Existing Transport Infrastructure

14.3.2.1 Road Network

Stocking Avenue runs in an east-west direction along the southern site boundary, comprising a two-way single lane carriageway and is subject to a speed limit of 50kph.

Stocking Avenue connects to a four-arm roundabout junction with Stocking Lane (R115) approximately 300m to the east to the development site. Approximately 1.2km to the west of the subject site, Stocking Avenue connects to a roundabout junction with Hunters Road and

Ballycullen Road, which provides onward connections to the M50 Motorway Junction 12 north-west of the site. The M50 Motorway provides strategic network access across the Greater Dublin Area and onward links to the M1 Motorway Northbound and the M11 Motorway Southbound, via Blanchardstown and Sandyford.

Stocking Lane (R115) extends from Stocking Avenue junction in both northern and southern directions, towards the city centre of Dublin (via Ballyboden) and the Dublin Mountains, respectively.

Ballycullen Road extends from the roundabout with Stocking Avenue north towards Firhouse Road (R114). It crosses Killinniny Road (R113) at a 4-arm signalized junction, continuing east onto R113, then changing to St. Colmcille's Way where access is provided to the M50 (northbound and southbound) via Junction 12, while to the west access can be gained to Tallaght and south west Dublin.

Figure 14.3 below illustrates the location of the subject site within the context of the existing road network.



Figure 14.3: Existing Road Network (Source: www.google.ie/maps)

14.3.2.2 Existing Cycling and Pedestrian Facilities

A segregated cycle track and footpath is provided on both sides of Stocking Avenue between the development site and the Stocking Lane/Stocking Avenue junction to the east and the junction with Ballycullen Road and Hunters Road to the west as illustrated below in **Figure 14.4**. A segregated southbound cycle tracks is provided on Ballycullen Road while northbound cyclists are required to use the northbound bus lane as illustrated below in **Figure 14.5.**



Figure 14.4: Pedestrian/Cycle Facilities on Stocking Avenue



Figure 14.5: Pedestrian/Cycle Facilities on Ballycullen Road

Furthermore, there are a variety of cycle facilities available on the surrounding network as illustrated below in **Figure 14.6** which shows an extract of the National Transport Authorities' (NTA) Greater Dublin Area Existing Cycle Facilities Map.

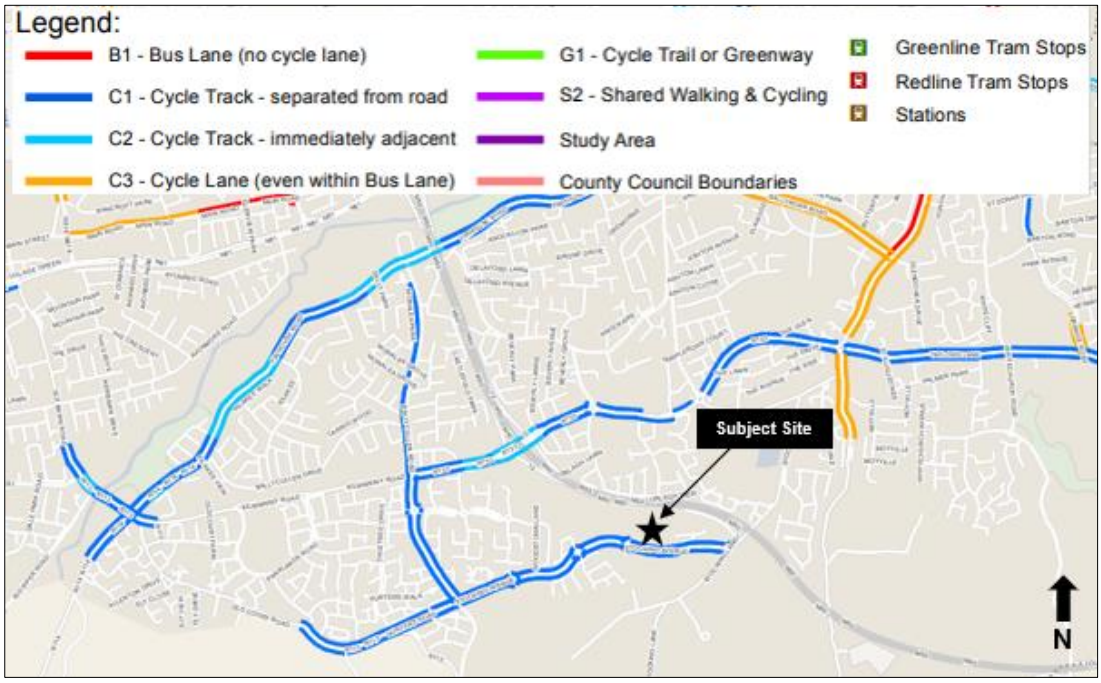


Figure 14.6: GDA Cycle Network Plan – Existing Cycle Facilities (Source: Extract of Sheet E6 GDA Cycle Network Plan)

14.3.2.3 Public Transport – Bus

Dublin Bus Route 15b travels along Stocking Avenue with bus stops located to the south boundary of the site along Stocking Avenue (approx. 1min walking). Dublin Bus Route 15 travels along Ballycullen Road with bus stop facilities available approximately 1.2km to the west of the subject site. Dublin Bus Route 65b travels along Ballycullen Road with bus stop facilities available approximately 2.0km to the northwest of the subject site. Go Ahead Bus Route 161 travels along Edmondstown Road with bus stop facilities available approximately 1.2km to the east of the subject site. Go Ahead Bus Route 175 travels along Scholarstown Road with bus stop facilities available approximately 1.8km to the northwest of the subject site.

Route 15b, which travels along Stocking Avenue directly passing the subject development site provides convenient connections to and from Rathfarnham, Rathgar, City Centre and Grand Canal Dock. Additional areas can be accessed via the number 15 route with connections to/from Knocklyon, Templeogue, Rathgar, City Centre, Fairview, Coolock and Clongriffin available. Route 65b offers connections to/from the City Centre, Rathmines, Terenure, Templeogue, Old Bawn and Citywest. Route 161 offers connections to/from Dundrum, Nutgrove, Ballyboden and Rockbrook. Route 175 offers connections to/from Citywest, Old Bawn, Marley Park, Dundrum and UCD.

Table 14.1 outlines the bus routes and their frequencies, while **Figure 14.7** illustrates the location of the bus stops in context of the development site.

Route Number	Route	Monday – Friday	Saturday	Sunday
15	Clongriffin - Ballycullen Rd	8 - 12	15	15
15b	Grand Canal Dock (Benson St.) - Stocking Ave	15	15	20 - 30
65b	Poolbeg St. - Citywest	60	60	60
161	Dundrum - Rockbrook	8 Times Daily	-	-
175	Kingswood Ave. - UCD	20 -30	40 - 60	60

Table 14.1: Dublin Bus Service Average Frequency (In Minutes)

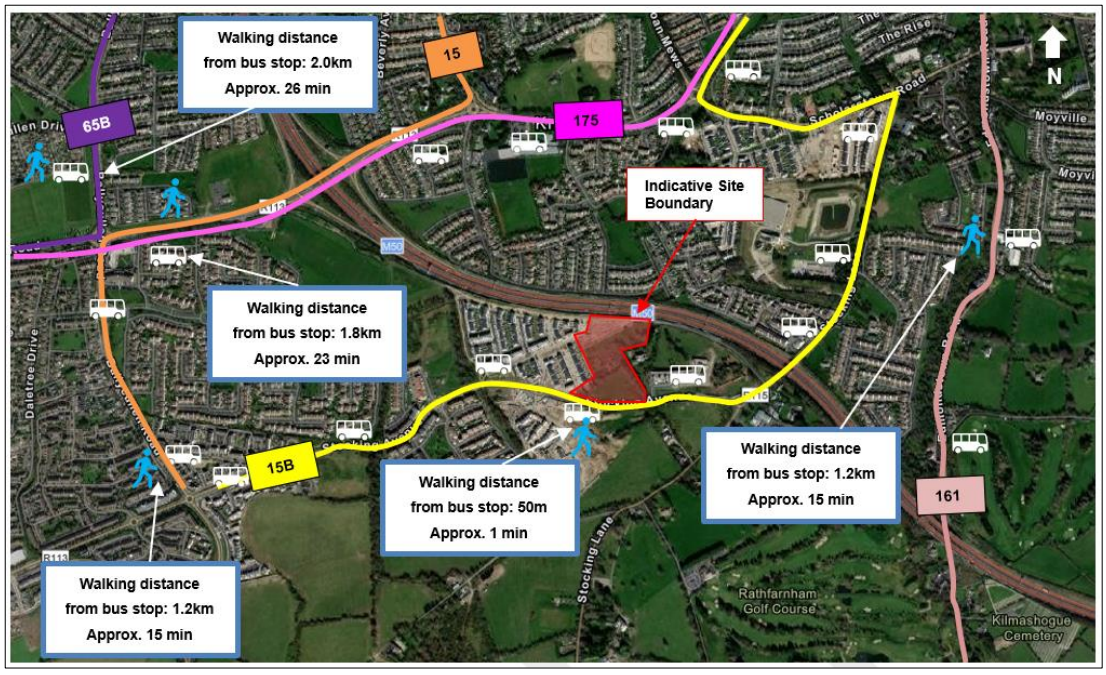


Figure 14.7: Existing Dublin Bus Routes and walking distance from Bus Stops

14.3.2.4 Site Accessibility - Walking

Existing walking time isochrones from the development site are shown in **Figure 14.8**, which illustrates the high levels of accessibility for pedestrians walking to/from the site. The walking time isochrones illustrates that food supermarkets and St Colmcille's Community School is within a 30 minute walking distance, and Sancta Maria College, Ballyroan Boys National School, Scoil Naomh Padraig and Colaiste Eanna C.B.S are within a 45 minute walking distance.

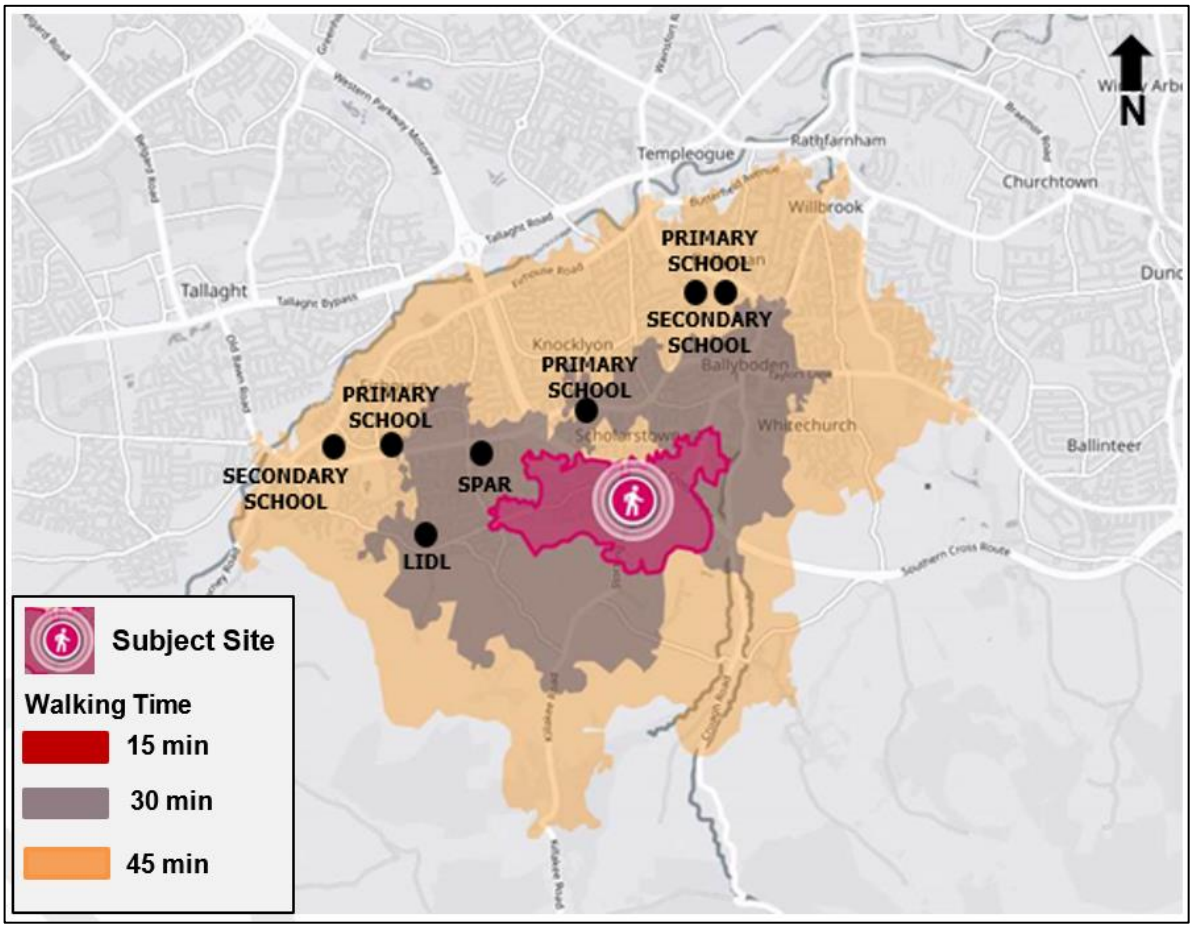


Figure 14.8: Walking Isochrones from the Subject Site (Source: Traveltime.com)

14.3.2.5 Site Accessibility - Cycling

The cycling time isochrones from the development site were created and are shown in **Figure 14.9** below, which illustrates that Tallaght is within a 15 minute cycling distance from the subject site, whereas, Rathfarnham, Dundrum, Saggart are within a 30 minute cycling distance and Brittas, Clondalkin, Sandyford, Blackrock and Dublin City Centre are within a 45 minute cycling distance from the proposed development site entrance.

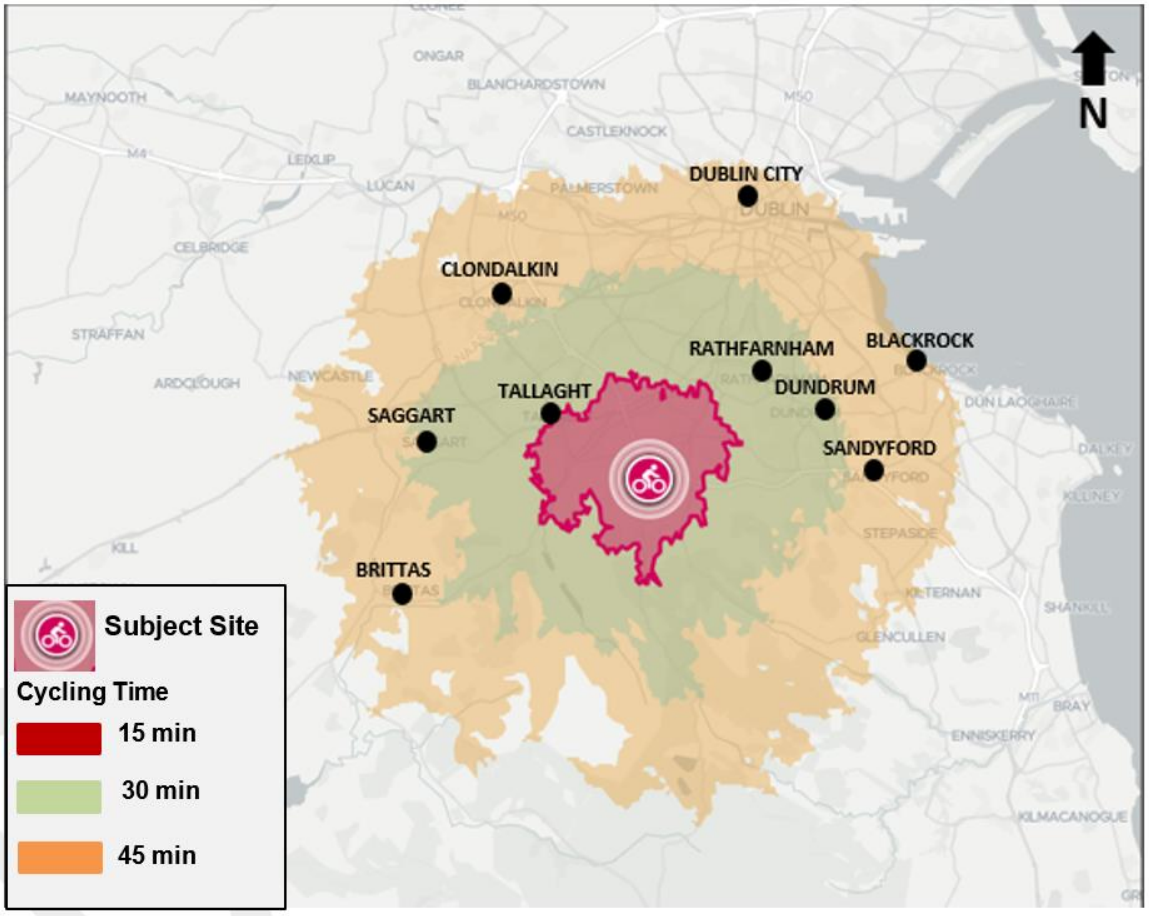


Figure 14.9: Cycling Isochrones from the Subject Site (Source: Traveltime.com)

14.3.2.6 Site Accessibility - Public Transport & Walking

Regarding public transport accessibility, the subject site currently benefits from bus services in close proximity to the site as outlined in the provious section. In order to obtain reaslistic journey times, the following maps give travel times during AM peak time hours, in this case 8.00 on a Tuesday. The public transport time isochrones from the development site were created and are shown in **Figure 14.10** below, illustrates that Tallaght, Rathfarnham, Rathmines and Portobello are within a 30 minute public transport distance and Crumlin, Dundrum and Dublin City Centre are within a 45 minute public transport distance from the proposed development site entrance.

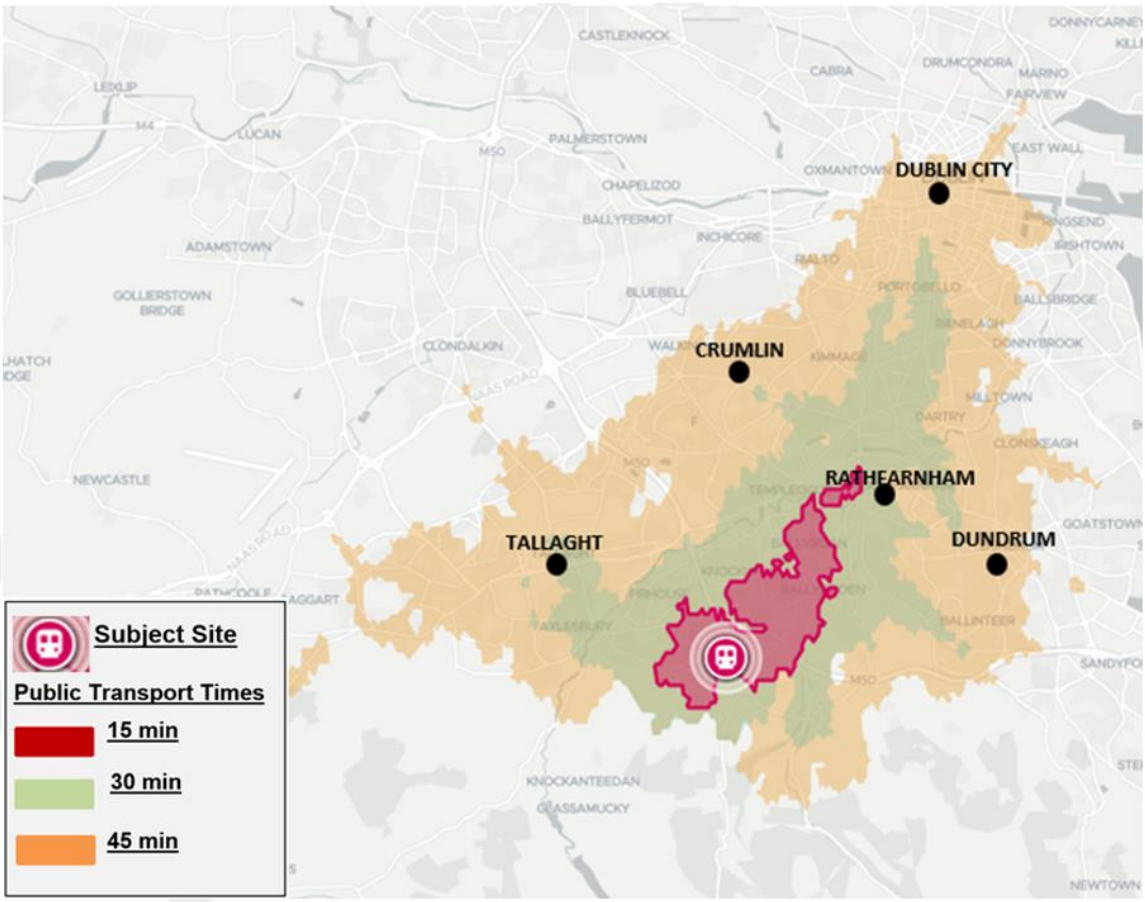


Figure 14.10: Public Transport Isochrones from the Subject Site (Source: Traveltime.com)

14.3.3 Existing Traffic Conditions

14.3.3.1 Traffic Surveys

In order to establish the existing local road networks traffic characteristics and subsequently enable the identification of the potential impact of the proposed development, a number of traffic surveys were commissioned and undertaken by IDASO Ltd. in January 2020.

With the objective of quantifying the existing traffic movements across the local road network classified vehicle junction turning counts were conducted over a 12-hour survey period from 07:00 to 19:00 on Tuesday 21st January 2020 at the following three junctions;

- Stocking Lane / Stocking Avenue Roundabout;
- Stocking Avenue / White Pines Way / White Pines Crescent Roundabout; and
- Stocking Avenue / Stocking Well Row / Stocking Wood Roundabout.

The analysis of the survey results established that the local weekday AM and PM peak hours occurred between 07:30 - 08:30 and 17:00 – 18:00 respectively. **Figure 14.11** illustrates the junctions surveyed and included in the traffic analysis.



Figure 14.11: Junctions Surveyed

14.3.3.2 Existing Facilities

Reference has been made to the existing road network as well as the existing pedestrian and cycling facilities in section 14.5.2 above.

14.3.4 Transport Planning Policies

14.3.4.1 Introduction

Relevant transport policies that influence the design and appraisal of the subject residential proposal have been included and considered:

- Smarter Travel – A Sustainable Transport Future – 2009;
- Sustainable Urban Housing: Design Standards for New Apartments – 2018;

- Design Manual for Urban Roads and Streets – 2013;
- Transport Strategy for Greater Dublin Area – 2016-2035;
- South Dublin County Development Plan 2016-2022;
- Ballycullen - Oldcourt Local Area Plan - 2014;
- Greater Dublin Area Cycle Network Plan (2013); and
- Busconnects.

14.3.5 Transport Infrastructure Objectives

14.3.5.1 Pedestrian Proposals

The Ballycullen-Oldcourt LAP (2014) includes proposals for the provision of road infrastructure upgrades along with upgraded/new pedestrian and cycle facilities within the LAP area as shown in **Figure 14.12** and summarised as follows:

- Roundabouts along Stocking Avenue to be upgraded to signal controlled junctions;
- The construction of the "Oldcourt Main Link Street" which will serve the subject development and future developments within the Oldcourt Lands. It will connect Bohernabreena Road to the west with Oldcourt Road to the east;
- Pedestrian/Cycle Connections linking the subject site with the neighbouring residential areas to the west; and
- Pedestrian Crossing facilities at various locations along Stocking Avenue.

It is noted that the Stocking Avenue roundabout, located to the southwest of the site is indicated in the LAP to be removed or signalised. However, this roundabout was upgraded as part of the planning application SD14A/0222, to better reflect DMURS guidelines, providing a safer environment for pedestrians and cyclists while also reducing traffic speeds. Based on discussions with SDCC Roads Department throughout the pre-planning stages, it is understood that the roundabout would not be removed/signalised in the near future.

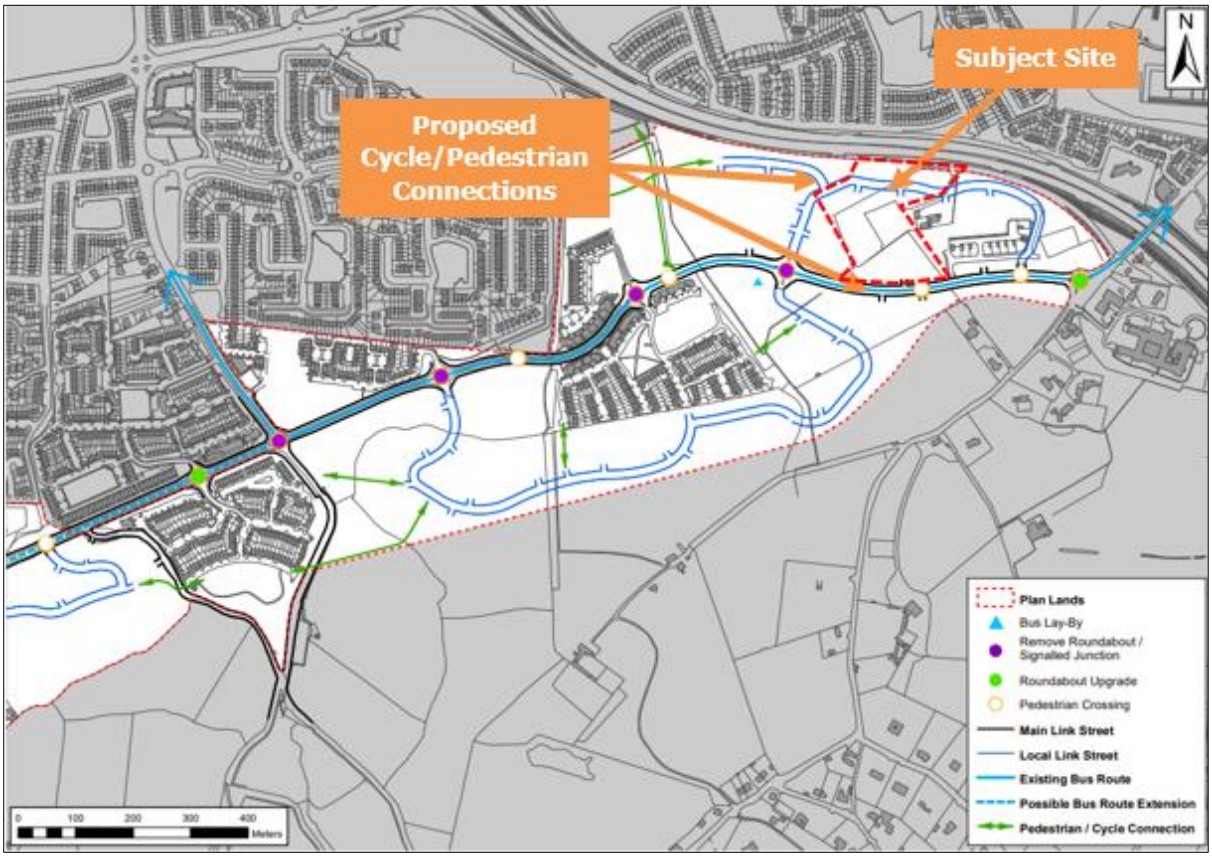


Figure 14.12: Infrastructure Proposals (Source: *Ballycullen Oldcourt LAP 2014*)

14.3.5.2 Cycle Network Proposals

The subject site is located within the "Dublin South West Sector" as outlined within the Greater Dublin Area Cycle Network Plan (2013). There is a feeder route proposed along Stocking Avenue which will provide a connection to Secondary Route SO6 to the west and Secondary Route 10 to the east. As mentioned in Chapter 14.5.2.2, there are currently segregated cycle tracks on both sides of Stocking Avenue from Stocking Lane junction to Dodderbrook.

According to the GDA, the proposals include upgrades to the Orbital Cycle Route SO6 between Scholarstown and Old Bawn via the Ballycullen area and upgrades to the Radial Cycle Route 10 along from Portobello Bridge on the Grand Canal along Rathmines Road and Rathgar Road to Terenure Cross.

In the vicinity of the subject site, the Plan proposes the following route additions as indicated on **Figure 14.13** below:



Figure 14.13: Proposed Cycle Routes (Extract of Sheet N6 GDA Cycle Network Plan 2013)

14.3.5.3 Public Transport Proposals – Dublin BusConnects

The National Transport Authority (NTA) has developed a strategic transport plan, known as BusConnects, which will transform and overhaul the current bus network to provide a more efficient network. The proposed network will deliver the 'next generation' of bus corridors on the busiest routes and redesign routes with the aim of offering fast, predictable and reliable bus journeys.

Under the BusConnects proposals, the following routes will serve Ballycullen and the subject site and are shown below in **Figure 14.14:**

- A1 Route – Ballycullen - Beaumont
- 85 Route – Tallaght – Parnell Square

The number 85 bus route, proposed under BusConnects, runs from Tallaght to the City Centre via Ballyboden, Rathfarnham, Harold's Cross and on to Parnell Square. This route is proposed to operate with a frequency of 10-15 minutes along Stocking Avenue and is directly adjacent the subject development site (approx. 1 min walk). This new bus route provides the subject development site with direct access to Tallaght, a proposed transport hub/key interchange between several radial and orbital services, along with the LUAS Red Line which offers an alternative means of travelling to the city centre.

The A1 bus route runs from Ballycullen to Beaumont via City Centre. This route is proposed to run along Ballycullen Road, approximately 1.2km west of the subject development (approx. 16mins walk), with services proposed to operate with a 10-15 minutes frequency.

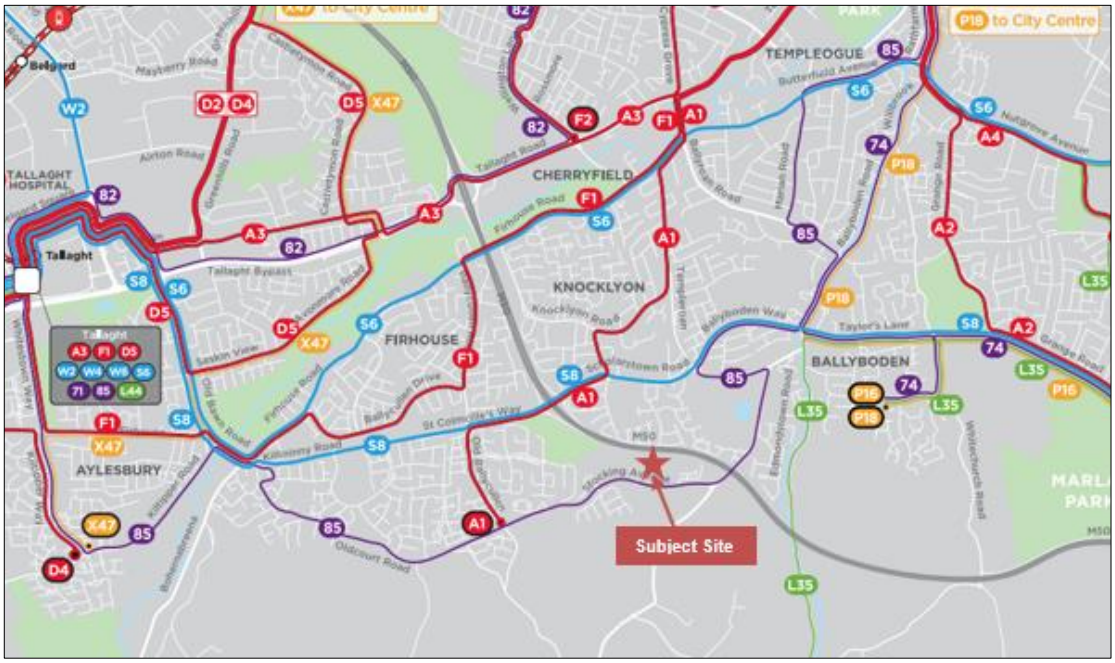


Figure 14.14: BusConnects Proposed Routes Serving the Subject Site (Source: www.busconnects.ie)

14.3.6 Stakeholder Consultation

Discussions have taken place with SDCC's Roads Engineer regarding the required scope of the Traffic and Transportation Assessment and other issues in relation to site access. SDCC did not raise any particular concerns regarding traffic & transport.

14.4 Characteristics of the Proposed Development

14.4.1 Development Schedule

The current subject proposals seek permission for the provision of a residential development of 241 units, in 5 no. apartment blocks and 3 no. duplex blocks, which includes 93 no. 1 Bed and 148 no. 2 bed units and a community centre. The subject development is located on lands to the northeast of the Stocking Avenue / White Pines Way / White Pines Crescent roundabout in Woodstown, Dublin. The subject development proposes a total of 204 no. car parking spaces and 401 no. cycle parking spaces.

14.4.2 Site Access Arrangements

The main vehicular access to/from the subject development will be provided via a new priority junction onto Stocking Avenue on the southern boundary of the site, as shown in **Figure 14.15** below. There will also be a secondary vehicular access to/from White Pines Way via a new priority junction on the north-western boundary of the site.

These vehicular accesses will also be accessible to both pedestrian and cyclists. There are additional pedestrian access points located to the south, providing access to Stocking Avenue, and to the north, providing access to the pedestrian / cycle connection, as shown in **Figure 14.15.** This pedestrian / cycle connection directly connects Stocking Lane and Scholarstown Road. These non-vehicular access points provide filtered permeability, ensuring shorter walking and cycling distances.

Speeds within the development will be minimised through the inclusion of a number of vertical and horizontal control measures including;

- Tight corner radii;
- Narrow streets (generally 5.5m);
- Ramp entry treatment to site; and
- Short lengths of straight streets.

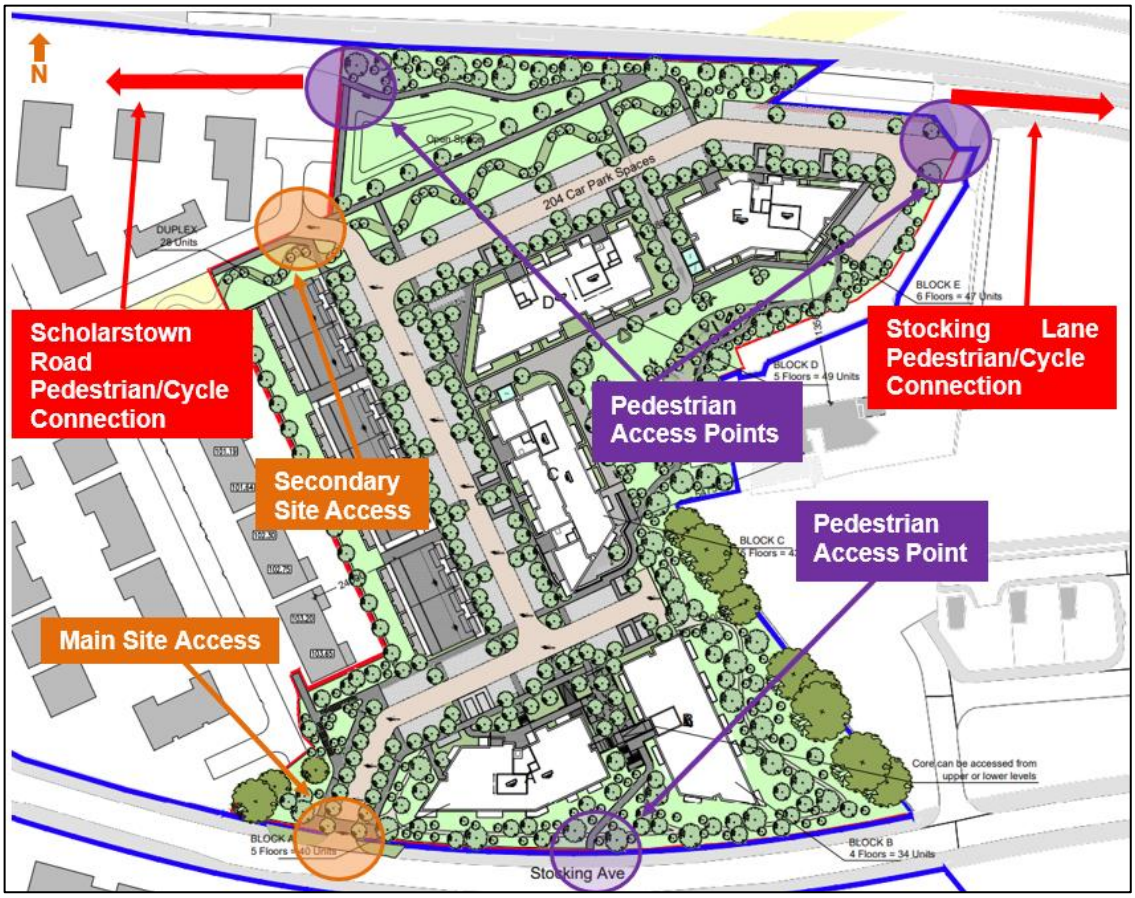


Figure 14.15: Proposed Site Access Locations

14.4.3 Cycle Parking

The development proposes 394 no. dedicated cycle parking spaces to serve the apartments with an additional 7 no. cycle parking spaces for the community centre, which equates to a total of 401 cycle spaces. The proposed number (401 spaces) is significantly above the SDCC guidelines (80 spaces) and is close to the DHPLG guidelines (510 spaces). This level of cycle parking encourages and supports increased usage of cycling as a sustainable mode of travel to/from the proposed development.

14.4.4 Car Parking

The development vehicle parking proposals include the provision of a total 204 no. on surface car parking spaces, 194 of which are residential parking spaces, (0.80/unit), and 10 of which are assigned for the community centre. These car parking spaces have been allocated as follows;

- 10 no. car parking spaces for the community centre.
- 194 no. car parking spaces for the apartment units (241 units).
- 3 no. car parking spaces will be provided for car-share; and
- 11 no. mobility impaired parking spaces.

The development proposes a total of 21 electric vehicle spaces that will be operational on opening of the development, in accordance with SDCC requirements. The total 204 no. parking spaces will be provided with ESB ducting for future potential use by electric vehicles.

14.5 Potential Impact of the Proposed Development

14.5.1 Construction Stage Impacts

14.5.1.1 Management of Construction Activities

All construction activities will be regulated by means of an agreed Construction Traffic Management Plan (CTMP) the details of which will be agreed with the local roads authority prior to the commencement of construction activities on-site. The principal objective of the CTMP is to ensure that the impacts of all building activities generated during the construction of the proposed residential development upon both the public (off-site) and internal (on-site) environments, are fully considered and proactively managed / programmed respecting key stakeholders requirements. This thereby ensures that both the publics and construction workers safety is maintained at all times, disruptions minimised and works are undertaken within a controlled environment where hazards are either avoided or minimised.

14.5.1.2 Construction Traffic

Construction traffic will only be generated on weekdays (0700-1900 subject to Planning conditions) and will consist of the following two principal categories:

- Private vehicles owned and driven by site construction staff and by full time supervisory staff.
- Excavation plant, dumper trucks and delivery vehicles involved in site development works and material delivery vehicles for the following: granular fill materials, concrete pipes, manholes, reinforcement steel, ready-mix concrete and mortar, concrete blocks, miscellaneous building materials, etc.

The likely impact of the construction works will be temporary in nature. The number of staff on site will fluctuate over the implementation of the subject scheme. Nevertheless, based upon the experience of similar projects, it would be expected that approx. 30 - 40 staff will be on site at any one time, subsequently generating no more than 35 two-way vehicle trips during the peak AM and PM periods over the period of the construction works (a large portion of construction workers will use shared transport). On-site employees will generally arrive before 08:00, thus avoiding the morning peak hour traffic. These employees will generally depart after 16:00. A designated on-site car park area will be made available to workers to avoid any overspill of parking on the surrounding network.

The potential impact during the construction phase with all the above considered would have a short-term slight effect on the surrounding network however, with the CTMP and deliveries managed accordingly, this will have imperceptible effect.

A Construction Traffic Management Pan (CTMP) will be prepared in advance of any works commencing on site. This will detail, amongst other matters, how deliveries and HGV movements will be actively controlled and managed. This will help to ensure HGVs and deliveries arrive at a dispersed rate during the course of the working day. It is anticipated that the proposed development would be constructed over a period of approximately 24 months. Following the completion of the initial site clearance works, the generation of HGV movements during the build period will be evenly spread throughout the day and as such will not impact significantly during the peak traffic periods. For this scale of development, we do not expect HGV vehicle movements to exceed 8 vehicles per hour during the busiest period of construction 'build' works.

An appropriate control and routing strategy for HGVs can also be implemented for the duration of site works as part of the CTMP. It is not proposed to utilise any roads with weight/height restrictions as part of the routing of HGVs during the construction phase. The proposed development gains direct access off Stocking Avenue, which provides direct access to the strategic road network including the M50. HGVs will be directed to use Stocking Avenue and Ballycullen Road when accessing/egressing the site from the wider strategic network.

Considering the site's proximity to the strategic road network and following the implementation of an appropriately detailed CTMP, it is concluded that construction traffic will not give rise to any significant traffic concerns or impede the operational performance of the local road network and its surrounding junctions.

At this initial stage it is assumed that whilst the first 100 units will be completed by the end of 2022, the full scheme is likely to be fully completed by 2027, which is the Interim design year for this proposed development.

14.5.2 Operation Stage Impacts

Once the subject development is fully complete and occupied two distinct peak arrival / departure times are expected during a typical weekday. Specifically, there is expected to be AM peak between 07:30 to 08:30 when people are leaving for work or educational purposes. The PM peak is expected around 17:00 to 18:00 when residents would be returning to the subject site. These peaks have been established by analysing classified vehicle junction turning counts that were conducted over a 12-hour survey period from 07:00 to 19:00 on Tuesday 21st January 2020 at the following three junctions;

- Stocking Lane / Stocking Avenue Roundabout;
- Stocking Avenue / White Pines Way / White Pines Park Roundabout; and
- Stocking Avenue / Stocking Well Row / Stocking Wood Roundabout.

In order to analyse and assess the impact of the proposed development on the surrounding road network, a traffic generation and distribution model (excel based) of the following key junctions was created as illustrated in **Figure 14.16**:

- **Junction 1** – Stocking Avenue / Stocking Well Row / Stocking Wood Roundabout
- **Junction 2** – Stocking Avenue / White Pines Way / White Pines Crescent Roundabout
- **Junction 3** – Stocking Avenue / Site Access Junction
- **Junction 4** – Stocking Avenue / Stocking Lane Roundabout



Figure 14.16: Junctions Included in Network Analysis

14.5.2.1 Trip Generation

To estimate the potential level of vehicle trips that could be generated by the proposed development, reference has been made to the TRICS database. TRICS provides trip rate information for a variety of different land uses and development types, which can be applied to the subject development. TRICS data is primarily UK based, although a number of Irish sites have recently been included and the number of Irish sites continues to expand. Nevertheless, we consider that TRICS will provide a reasonable indication of traffic generation from the proposed development.

Table 14.2 presents the trip rates and the traffic generation for the proposed development during the morning and evening peak hour periods. The proposed residential development will be implemented in two different phases to provide an accurate representation of likely construction and occupational trends for a development of this size.

- 2022 Opening Year = 100 Residential Units
- 2027+ Years – Full Development = 241 Residential Units

Land Use	Period	Trip Rates (Per Unit)		Trip Generation (2022)		Trip Generation (2027+)	
		Arr	Dep	Arr	Dep	Arr	Dep
Apartment / Duplex	AM	0.048	0.187	5	19	11	45
	PM	0.186	0.077	19	8	45	19
Community Centre	AM	11.319	1.429	1	0	1	0
	PM	6.176	10.000	0	1	0	1

Table 14.2: Predicted Development Trip Rates and Vehicle Trips Generation

14.5.2.2 Committed Development

There are six committed developments in the vicinity of the subject site which hold planning permissions and one proposed residential development that had not yet been granted planning permission. These may therefore have an impact on the capacity of the local road network influencing traffic flows and junction performances and have been taken into

consideration within the traffic generation excel. These committed developments are as follows:

- The residential development (SD19A/0099) site located to the south of the subject development site, was granted permission for 99 no. residential units. It is noted that this committed development has been completed and is currently being occupied. However, since it was not in place at the time the traffic surveys were undertaken, the predicted development traffic from this scheme has been included in the committed development vehicle trip generation calculations.

- The neighbourhood centre development (SD19A/0345) site located to the southwest of the subject development site, was granted permission for a retail unit (1,479m2) and a crèche (385m2) incorporating a community centre (192m2).

- The residential development (SD17A/0121) site located to the west of the subject development site, was granted permission for 133 no. residential units and a crèche. It is noted that this committed development has been completed and is occupied. It is noted that this committed development has been completed and is currently being occupied, however, at the time the traffic survey, 40% of the site was occupied. Therefore, the remainder of the predicted trips from this scheme (60%) has been included in the committed development vehicle trip generation calculations.

- The residential development (SD19A/0104) site located to the west of the subject development site, was granted permission for 24 no. residential units. It is noted that this committed development is currently under construction and since it was not in place at the time the traffic surveys were undertaken, the predicted development traffic from this scheme has been included in the committed development vehicle trip generation calculations.

- The residential development (SD18A/0025) site located to the west of the subject development site, was granted permission for 83 no. residential units. It is noted that this committed development has been completed and is currently being occupied, however, at the time the traffic survey, 60% of the site was occupied. Therefore, the remainder of the predicted trips from this scheme (40%) has been included in the committed development vehicle trip generation calculations.

- The residential development (SD17A/0468) site located to the west of the subject development site, was granted permission for 64 no. residential units.

- The residential development (ABP-308642-20)(White Pines Central) site located to the south of the subject development site consists of 140 no. residential units. This development will be accessed via White Pines Crescent. This development is currently at pre-application stage, however, it has been included for robustness.

14.5.2.3 Trip Distribution

The distribution of the subject development traffic is based on the surveyed traffic movements at the nearby key local junctions. The proposed distribution of the subject developments forecast generated vehicle movements as proposed by DBFL are presented in Appendix B of the TTA report.

14.5.2.4 Traffic Growth

An Opening Year of 2022 was assumed for this assessment. In accordance with TII (NRA) Guidance, Future Design years (+5 and +15 years) of 2027 and 2037 have also been adopted.

The TII Project Appraisal Guidelines (PAG) have been utilised to determine the traffic growth forecast rates. The traffic growth forecast rates within the PAG ensures local and regional variations and demographic patterns are accounted for.

Table 6.2 within the PAG provides Annual National Traffic Growth Factors for the different regions within Ireland. The subject site lies within 'County - Dublin' with the growth factors as outlined within **Table 14.3** below.

County	Low Sensitivity Growth				Central Growth				High Sensitivity Growth			
	2016-2030		2030-2040		2016-2030		2030-2040		2016-2030		2030-2040	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
Dublin	1.0163	1.0303	1.0046	1.0123	1.0180	1.0317	1.0062	1.0139	1.0211	1.0348	1.0100	1.0170

Table 14.3: National Traffic Growth Forecasts: Annual Growth Factors

Applying the annual factors (central growth) as outlined in **Table 14.5** above for the adopted Opening Year of 2022 and Future Horizon Year of 2037 (+15 years), the following growth rates have been adopted to establish corresponding 2022, 2027 and 2037 baseline network flows:

- 2020 to 2022 – 1.0363 (or 3.6%);
- 2020 to 2027 – 1.1330 (or 13.3%); and
- 2020 to 2037 – 1.2482 (or 24.8%)

14.5.2.5 Assessment Scenarios

In summary the following scenarios are considered:

Do Nothing
A1 – 2022 Base Flows + Committed Development
A2 – 2027 Base Flows + Committed Development
A3 – 2037 Base Flows + Committed Development

Do Something
B1 – 2022 Do Nothing (A1) + Proposed Development Flows (100 Units Complete)
B2 – 2027 Do Nothing (A2) + Proposed Development Flows (Fully Complete)
B3 – 2037 Do Nothing (A2) + Proposed Development Flows (Fully Complete)

14.5.2.6 Impact of Proposals

The Institution of Highways and Transportation document 'Guidelines for Traffic Impact Assessments' (1994) states that the impact of a proposed development upon the local road network is considered material when the level of traffic it generates surpasses 10% and 5% on normal and congested networks respectively. When such levels of impact are generated a more detailed assessment should be undertaken to ascertain the specific impact upon the network's operational performance. These same thresholds are reproduced in the NRA document entitled Traffic and Transport Assessment Guidelines (2014).

Figure 14.17 below details the total amount of two-way vehicle trips that will pass through the key off-site junctions in the 2037 Future Design Year and the resulting percentage increase in traffic flows as a result of the traffic generated by the proposed development.



Figure 14.17: Increase in Vehicle Trips Generated Through Key Of-Site Junctions (2037)

For the key junctions surveyed, it can be seen that the proposed development (241 units) in 2027 & 2037 would result in the following percentage impacts:

Junction No.	Junction	Design Year	Percentage Impact	
			AM Peak Hour	PM Peak Hour
1	Stocking Avenue / Stocking Well Row / Stocking Wood Roundabout	2022	1.5%	1.8%
		2027	3.3%	3.8%
		2037	3.0%	3.5%
2	Stocking Avenue / White Pines Way / White Pines Crescent Roundabout	2022	1.8%	1.9%
		2027	3.8%	4.1%
		2037	3.5%	3.8%
3	Stocking Avenue / Stocking Lane Roundabout	2022	1.5%	1.6%
		2027	3.2%	3.5%
		2037	2.9%	3.2%

Table 14.4: Proposed Developments Network Impact

The resulting percentage increase in traffic flows as a result of the traffic generated by the proposed development is established as being below the 10% threshold at all off-site junctions in both the AM and PM peak periods. As such the proposed development is not anticipated to have a material impact on the adjacent network and a more detailed traffic assessment of the surrounding junctions is not required.

A detailed assessment of the proposed site access junction (Junction 3) was undertaken.

14.5.2.7 Network Analysis

Junction 3: Site Access/Stocking Avenue Junction

The proposed three arm priority site access junction with Stocking Avenue was analysed for all future scenarios using the Junctions 9 PICADY software package. The results of the operational assessment of the junction during the weekday morning and evening peak periods are summarised in **Table 14.5**. The three arms of the priority-controlled junction were labelled as follows:

- Arm A: Stocking Avenue (W)
- Arm B: Site Access
- Arm C: Stocking Avenue (E)

The PICADY results reveal that the site access junction operates within capacity for all design year scenarios, with all RFC values being significantly less than the RFC optimum operational capacity of 0.85 (85%).

Year Scenario	Period	Arm	Description	RFC	Mean Max Queue (pcu)	Delay (s)
2022 DS	AM Peak	A	Stocking Avenue (W)	-	-	-
		B	Site Access	0.05	0.1	9.74
		C	Stocking Avenue (E)	0.01	0.0	6.08
	PM Peak	A	Stocking Avenue (W)	-	-	-
		B	Site Access	0.02	0.0	8.41
		C	Stocking Avenue (E)	0.02	0.0	4.73
2027 DS	AM Peak	A	Stocking Avenue (W)	-	-	-
		B	Site Access	0.12	0.1	10.83
		C	Stocking Avenue (E)	0.02	0.0	6.10
	PM Peak	A	Stocking Avenue (W)	-	-	-
		B	Site Access	0.05	0.1	9.11
		C	Stocking Avenue (E)	0.06	0.1	4.73
2037 DS	AM Peak	A	Stocking Avenue (W)	-	-	-
		B	Site Access	0.12	0.2	11.28
		C	Stocking Avenue (E)	0.02	0.0	6.08
	PM Peak	A	Stocking Avenue (W)	-	-	-
		B	Site Access	0.05	0.1	9.36
		C	Stocking Avenue (E)	0.06	0.1	4.63

Table 14.5: Do Something PICADY Analysis Results

14.6 Mitigation and Monitoring Measures

14.6.1 Construction Stage

14.6.1.1 Mitigation

The trip generation of HGV'S during the construction period will be managed and arranged to ensure movements are evenly spread throughout the day and as such will not impact significantly during the peak traffic periods. Nevertheless, mitigations measures outlined for the Construction Stage include the provision of a Construction Management Plan with an associated Construction Traffic Management Plan (CTMP). The CTMP will incorporate a range of integrated control measures and associated management activities with the objective of minimising the construction activities associated with the development. The CTMP will be agreed with the Local Authority and which will include the following initiatives to avoid, minimize and/or mitigate against the anticipated construction period impacts:

- Prescribed and agreed working hours;
- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and adjacent roads;
- Dedicated construction haul routes for incoming materials will be identified and agreed with South Dublin County Council prior to commencement of activities on-site;
- Delivery vehicles to and from the site will be spread across the working day to ensure the number of HGVs travelling during the peak hours will be relatively low;
- Where possible construction team members will be brought to/from site in vans/minibuses, which will serve to reduce trip generation potential;
- Appropriate on-site parking arrangements for construction personnel to prevent overspill parking on the local road network;
- 'Way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas;
- Site entrance point/s from the public highway will be constructed with a bound, durable surface capable of withstanding heavy loads and with a sealed joint between the access and public highway. This durable bound surface will be constructed for a distance of 10m from the public highway;
- Truck wheel wash facilities will be installed at construction entrances and any specific recommendations with regards to construction traffic management made by South Dublin County Council will be adhered to;
- Road cleaning and sweeping measures to be put in place if required;
- Potential localised traffic disruptions during the construction phase will be mitigated through the implementation of industry standard traffic management measures. These traffic management measures shall be designed, implemented and maintained in accordance with the Department of Transport's Traffic Signs Manual "Chapter 8 Temporary Traffic Measures and Signs for Roadworks" and "Guidance for the Control and Management of Traffic at Roads Works – 2nd Edition" (2010);
- Material storage zone will be established in the compound area and will include material recycling areas and facilities; and
- On completion of the works, all construction materials, debris, temporary hardstands etc. from the site compound will be removed off-site and the site compound area reinstated in full on completion of the works.

14.6.1.2 Monitoring

While it has been demonstrated that the proposed development has negligible impact on the operation of the local network, it is nevertheless recommended that the local area should be monitored in terms of transportation efficiencies into the future.

14.6.2 Operational Stage

14.6.2.1 Mitigation

In order to promote and maximise sustainable transportation modes, cycle parking has been provided at a rate which exceeds South Dublin County Development Plan (2016-2022) minimum standards which may act as a facilitator for the growth of Cycle trips undertaken for short to medium distance trips to/from the site, whilst apartment vehicle parking spaces have been provided at a rate slightly below the Department of Housing, Planning and Local Government's Sustainable Urban Housing: Design Standards for New Apartments Guidelines (0.80/unit), which is lower than those outlined in the South Dublin County Development Plan.

The increase in cycle parking provisions, and simultaneous reduction in vehicle parking provisions for apartment units aim to increase the number of cycle trips taken and therefore encourage a modal split shift towards cycling for short to medium distance trips. Furthermore, the proposed pedestrian access points and pedestrian linkages to/from the subject site will also encourage and support the uptake walking trips for short to medium distance trips.

14.6.2.2 Monitoring

While it has been demonstrated that the proposed development has negligible impact on the operation of the local network, it is nevertheless recommended that the local area should be monitored in terms of transportation efficiencies into the future.

14.7 Residual Impacts

14.7.1 Construction Stage

Provided the above mitigation measures and management procedures are incorporated during the construction phase, the residual impact on the local receiving environment will be temporary in nature and neutral in terms of quality and effect.

14.8 Difficulties Encountered

There were no material difficulties encountered in compiling and assessing the data for this EIAR sufficient to prevent modelling of the likely transport effects of the proposed development. The analysis reported within this chapter is based upon the traffic survey data specifically commissioned for this appraisal and undertaken in 2020.

15.0 MATERIAL ASSETS – SITE SERVICES

15.1 Introduction

This chapter of the EIAR comprises of an assessment of the likely impact of the proposed development on existing utility services in the vicinity of the site as well as identifying proposed mitigation measures to minimize any impacts.

The material assets considered in this chapter of the EIAR include ESB, Gas and Telecommunications. Note that Surface Water Drainage, Foul Drainage and Water Supply are addressed in Chapter 10.0 (Water & Hydrology).

In summary, the proposed development ("the site") comprises of 241 No. residential units, residential tenant amenity space (reception area, games space, residents lounge and gym) and dedicated community space on a 2.98 Ha site.

The proposed development will also include the following associated engineering infrastructure:

- Formation of an access onto Stocking Avenue to facilitate the primary vehicle access to the site (including minor modifications to existing pedestrian and cycle facilities along Stocking Avenue and relocation of a bus stop).
- Provision of internal site roads including associated footpaths.
- Provision of surface water drainage, foul drainage and water supply infrastructure.

15.2 Methodology

15.2.1 Consultation

Assessment of the likely impact of the proposed development on existing utility services in the vicinity of the site included a desktop review of the following information:

- Gas Networks Ireland Service Plans (refer to Appendix 15-A)
- ESB Networks Utility Plans (refer to Appendix 15-A)
- Eir E-Maps (refer to Appendix 15-A)

15.2.1 Gas

Gas Networks Ireland plans are included in Appendix 15-A showing the location of gas distribution pipes in the vicinity of the site.

An existing medium pressure distribution pipeline (180 PE-80 4bar) is shown running along the northern side of Stocking Avenue (adjacent to the site's southern boundary).

15.2.2 Power

An ESB Networks plan is included in Appendix 15-A showing the location of existing electrical services in the vicinity of the site.

Existing MV / LV underground cable routes are shown along Stocking Avenue and within the White Pines North development (to the west of the site).

15.2.3 Telecoms

Eir network plans are included in Appendix 15-A showing the location of existing telecommunications infrastructure in the vicinity of the site.

Telecommunications infrastructure is located along Stocking Avenue and within the White Pines North development (to the west of the site).

Existing telecommunications infrastructure is also shown within the southern portion of the site.

15.3 Characteristics of the Proposed Development

15.3.1 Gas

Gas supply for the proposed development (if required as part of the energy strategy) will be taken from the existing Gas Networks Ireland network located along Stocking Avenue.

15.3.2 Power

Power supply for the proposed development will be taken from the existing ESB Network located on Stocking Avenue.

15.3.3 Telecoms

The existing Eir network located along Stocking Avenue and within the southern portion of the site will be extended to service the proposed development.

15.4 Potential Impact of the Proposed Development

15.4.1 Construction Phase

There is potential interruption to ESB's network, Gas Networks Ireland's infrastructure and Eir's infrastructure while carrying out road works along the Scholarstown Road (e.g. during formation of site access junction) and while carrying out works to provide service connections to the proposed development.

15.4.2 Operational Phase

On completion of the construction phase, there will be no further impact on electrical, gas or telecommunications supplies.

15.4.3 'Do Noting Scenario'

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

15.5 Ameliorative, Remedial or Reductive Measures

15.5.1 Construction Phase

- Contractor to prepare Method Statement detailing proposals for works in the vicinity of existing utilities (method statement to be agreed with PSDP).
- Contractor to locate and record all services on site prior to commencement of excavations.
- Connections to the existing power, gas and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.
- Contractor to comply with HSA Code of Practice for Avoiding Danger from Underground Services.
- Contractor to obtain utility company network plans and arrange observation as required.
- Contractor/PSCS to implement safe systems of construction including but not limited to battering the sides of trench excavations and installation of trench shoring systems.
- Contractor to prepare and implement a Construction Traffic Management Plan that will be agreed with the Design Team and local authority and which will ensure the safety of the public during construction.
- Contractor must supervise vehicle movements to and from the site during construction in order to ensure that this traffic management plan is fully implemented. Plan to include deliveries to the site, staff parking, works outside the defined site such as utility connections.
- Public pedestrian routes to be established at site entrance as required.
- Contractor to prepare Method Statement for works in confined spaces, method statement to be agreed with PSDP. Contractor to comply with HAS Code of Practice for Working in Confined Spaces.
- All personnel using machinery/plant to have undergone training on the use of said machinery/plant. Ongoing site supervision to be undertaken to ensure all use of machinery/plant is in accordance with the training undertaken.

15.5.2 Operational Phase

No mitigation measures are proposed for the operational phase of this development.

15.5.3 'Do Nothing Scenario'

No mitigation measures are proposed in relation the site services described in this chapter if the development does not proceed.

15.6 Predicted Impact of the Proposed Development

15.6.1 Construction Phase

Implementation of measures outlined in Section 15.5.1 will ensure that the potential impacts of the proposed development on site services do not occur during the construction phase and that any residual impacts will be short term.

15.6.2 Operational Phase

Demand from the proposed development during the operational phase is not predicted to impact on the existing power, gas and telecoms network.

15.6.3 'Do Nothing' Scenario

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

15.7 Monitoring

Construction Phase
No specific monitoring is proposed in relation to electrical, gas and telecommunications infrastructure.

Operational Phase
No specific monitoring is proposed in relation to electrical, gas and telecommunications infrastructure.

15.8 Reinstatement

Reinstatement of any excavations, trenches etc. relating to the provision of electrical, gas and telecommunications connections is to be carried out in accordance with the relevant utility provider's requirements.

15.9 REFERENCES

- ESB Networks Plan.
- Gas Networks Ireland Network Plan.

- Eir E Map.

APPENDIX 15-A
UTILITY RECORD DRAWINGS

ESB Networks

TITLE: 20200330-004_A3

COLOUR CODE:

- BLACK - 38KV & HIGHER VOLTAGE OVERHEAD LINES
- GREEN - MV(10KV/20KV) OVERHEAD LINES
- BLUE - LV (400V/230V) OVERHEAD LINES
- CYAN - 38KV & HIGHER VOLTAGE UNDERGROUND CABLE ROUTES
- RED - MV/LV (10KV/20KV/400V/230V) UNDERGROUND CABLE ROUTES

DATE: 30-Mar-2020

** SCALE: 1:2000

** SCALE WHEN PRINTED ON AN A3 PAGE
XY COORDINATES DISPLAYED IN IRISH GRID COORDINATE SYSTEM

Maps reproduced by permission: Ordnance Survey Ireland Licence No. EN0023715-19, Copyright Ordnance Survey Ireland Government of Ireland

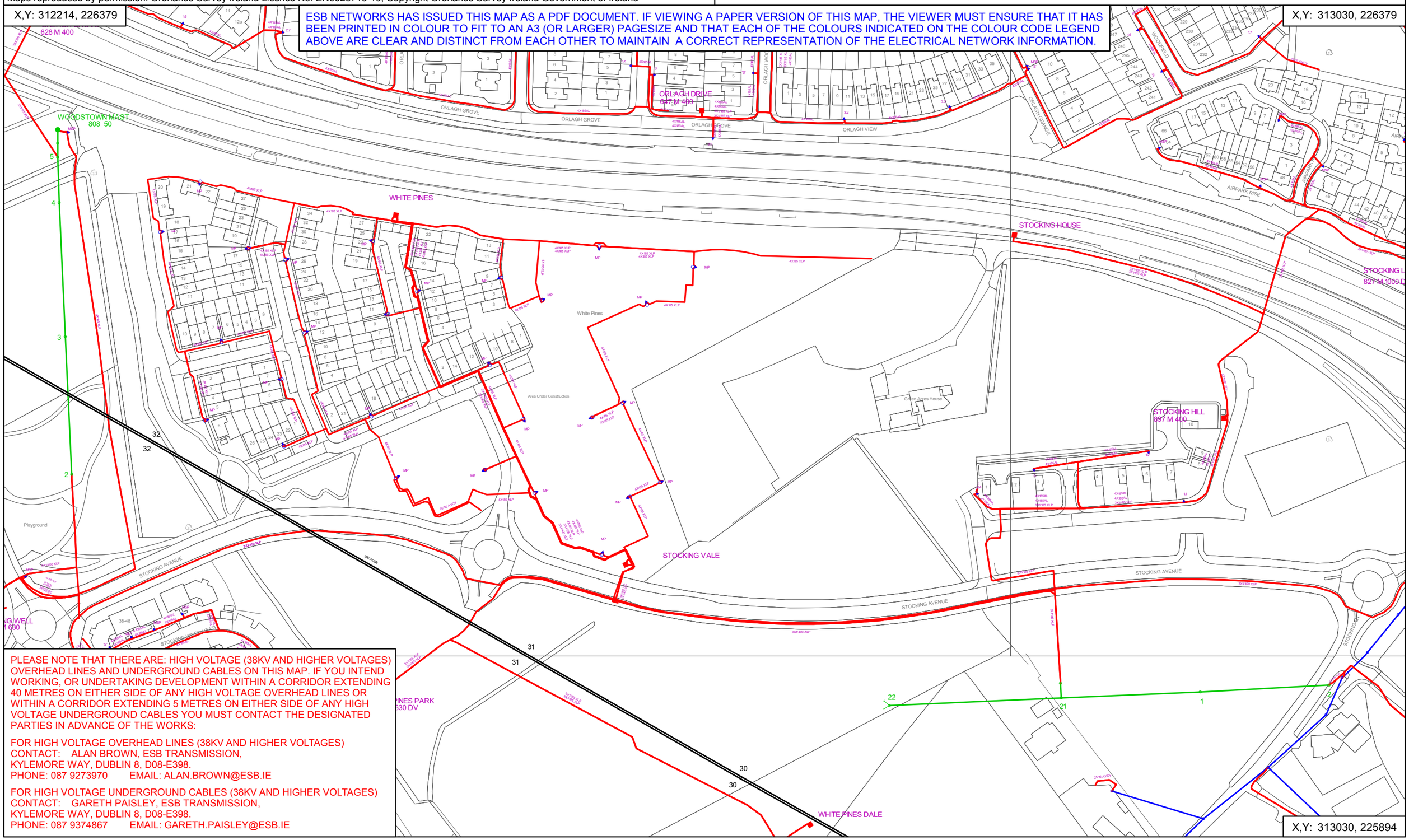
WARNING

THIS MAP INDICATES THE APPROXIMATE LOCATION OF ESB TRANSMISSION (400KV, 220KV, 110KV, 38KV) AND DISTRIBUTION (20KV, 10KV, 230V/400V) UNDERGROUND CABLES AND OVERHEAD LINES IN THE GENERAL AREA OF THE PROPOSED WORKS. ESB NETWORKS TAKES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE MAP. IT IS THE USER'S RESPONSIBILITY TO INDEPENDENTLY VERIFY THE INFORMATION AND THE LOCATION OF UNDERGROUND CABLES AND OVERHEAD LINES. LOW VOLTAGE (230V/400V) SERVICE CABLES (E.G. HOUSE SERVICES, FACTORY/SHOP SERVICES, PUBLIC LIGHTING LAMP SERVICES, ETC) ARE NOT INCLUDED BUT THEIR PRESENCE SHOULD BE ANTICIPATED. THE DEPTHS OF UNDERGROUND CABLES MUST NEVER BE ASSUMED. ADDITIONAL MORE DETAILED INFORMATION IS AVAILABLE FOR HIGH VOLTAGE TRANSMISSION UNDERGROUND CABLES (38KV, 110KV, 220KV, 400KV) FROM THE LOCAL ESB NETWORKS TRANSMISSION REPRESENTATIVE - SEE ATTACHED LIST FOR CONTACT DETAILS OR CALL 1850 372 757. NO WORK SHOULD BE CARRIED OUT IN THE VICINITY OF 38KV OR HIGHER VOLTAGE UNDERGROUND CABLES WITHOUT PRIOR CONSULTATION WITH ESB NETWORKS. BEFORE ANY MECHANICAL EXCAVATION IS UNDERTAKEN, THE ACTUAL LOCATION OF ALL UNDERGROUND ELECTRICITY CABLES MUST BE ESTABLISHED AND VERIFIED ON THE SITE USING: (A) UP-TO-DATE MAP RECORDS; (B) CABLE LOCATER EQUIPMENT OPERATED IN BOTH POWER AND RADIO MODES; (C) CAREFUL HAND DIGGING OF TRIAL HOLES USING 'SAFE DIGGING PRACTICE'. REFER ALSO TO 'HSA CODE OF PRACTICE FOR AVOIDING DANGER FROM UNDERGROUND SERVICES'. ESB TAKES NO RESPONSIBILITY FOR AND SHALL BEAR NO LIABILITY, HOWSOEVER ARISING, IN RELATION TO ANY DAMAGE, INJURY/DEATH OR LOSS OF SUPPLY AS A RESULT OF DAMAGE OR INTERFERENCE WITH ITS NETWORKS.

X,Y: 312214, 226379

ESB NETWORKS HAS ISSUED THIS MAP AS A PDF DOCUMENT. IF VIEWING A PAPER VERSION OF THIS MAP, THE VIEWER MUST ENSURE THAT IT HAS BEEN PRINTED IN COLOUR TO FIT TO AN A3 (OR LARGER) PAGESIZE AND THAT EACH OF THE COLOURS INDICATED ON THE COLOUR CODE LEGEND ABOVE ARE CLEAR AND DISTINCT FROM EACH OTHER TO MAINTAIN A CORRECT REPRESENTATION OF THE ELECTRICAL NETWORK INFORMATION.

X,Y: 313030, 226379

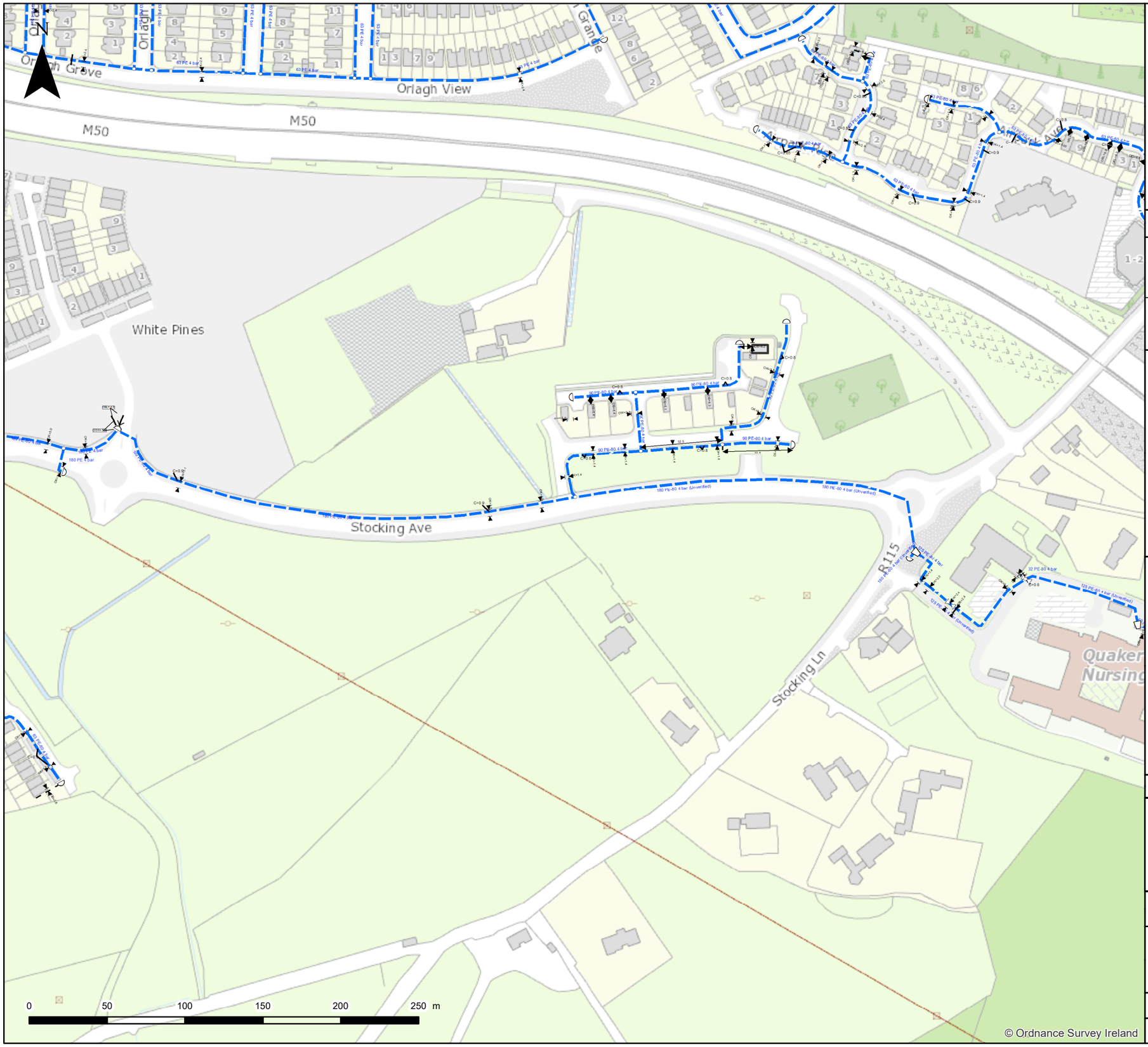


PLEASE NOTE THAT THERE ARE: HIGH VOLTAGE (38KV AND HIGHER VOLTAGES) OVERHEAD LINES AND UNDERGROUND CABLES ON THIS MAP. IF YOU INTEND WORKING, OR UNDERTAKING DEVELOPMENT WITHIN A CORRIDOR EXTENDING 40 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE OVERHEAD LINES OR WITHIN A CORRIDOR EXTENDING 5 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE UNDERGROUND CABLES YOU MUST CONTACT THE DESIGNATED PARTIES IN ADVANCE OF THE WORKS:

FOR HIGH VOLTAGE OVERHEAD LINES (38KV AND HIGHER VOLTAGES)
CONTACT: ALAN BROWN, ESB TRANSMISSION,
KYLEMORE WAY, DUBLIN 8, D08-E398.
PHONE: 087 9273970 EMAIL: ALAN.BROWN@ESB.IE

FOR HIGH VOLTAGE UNDERGROUND CABLES (38KV AND HIGHER VOLTAGES)
CONTACT: GARETH PAISLEY, ESB TRANSMISSION,
KYLEMORE WAY, DUBLIN 8, D08-E398.
PHONE: 087 9374867 EMAIL: GARETH.PAISLEY@ESB.IE

X,Y: 313030, 225894



Important Safety Notice: Damage to gas pipelines can result in serious injury or death. Gas network information is provided as a general guide. The exact location and depth of medium or low pressure distribution gas pipes must be verified on site by carrying out necessary investigations, including, for example, hand digging trial holes along the route of the pipe. Service pipes are not generally shown but their presence should always be anticipated.

High pressure transmission pipelines are shown in red. If a transmission pipeline is identified within 10m of any intended excavations then work must not proceed before GNI has been consulted. The true location and depth of a transmission pipeline must be verified on site by a representative of GNI. Contact can be made through 1850 427 747.

All work in the vicinity of the gas network must be completed in accordance with the current edition of the Health and Safety Authority publication, 'Code of Practice For Avoiding Danger From Underground Services' which is available from the Health and Safety Authority (1890 289 389) or can be downloaded at www.hsa.ie.

Legal Notice: Gas Networks Ireland (GNI) and its affiliates, accept no responsibility for the accuracy of any information contained in this document including data concerning location and technical designation of the gas distribution and transmission network (the"Information"). The Information should not be relied on for accurate distance or depth of cover measurements.

Any representations and warranties, express or implied, are excluded to the fullest extent permitted by law. No liability shall be accepted for any loss or damage including, without limitation,direct, indirect or consequential loss, arising out of or in connection with the use or re-use of the Information.

Reproduced from the Ordnance Survey by permission of the Government. Licence No. 3-3-34

- Aurora Telecom Duct
- Aurora Telecom Sub Duct
- Aurora Telecom Inserted Gas Pipe

Aurora TELECOM

Aurora Telecom Queries - 01-8926166 (Office Hours)
Aurora_Network_Queries@gasnetworks.ie
Aurora Telecom Emergency Only 1850 427399 / 01 2030120

- Transmission Pipe (High Pressure)
- Transmission Pipe (Construction Issue)
- Distribution Pipe (Medium Pressure)
- Distribution Pipe (Low Pressure)
- Service Pipe (Medium Pressure)
- Service Pipe (Low Pressure)
- Strategic Pipe (Medium Pressure)
- Strategic Pipe (Low Pressure)
- Inserted
- Abandoned Pipe

C=?	Cover (depth in metres)		Pressure Monitor
CP	CP Test Point		Protection (Slabbing)
	End Cap		Protection (Sleeve)
	Hot Tap		Reducer
	Installation		Service Terminator
	Valve		Tee
	Mains Verification**		Transition

** Please contact GNI on 1850-427747 for specific information

DIAL BEFORE YOU DIG 1850 42 77 47
In Emergency call 1850 20 50 50 Gas Networks Ireland

Gas Networks Ireland

GAS NETWORK INFORMATION

Description: GNI East

Location: 712718,726055

Plot Date: 26/03/2020 11:38	Scale: 2500 @ A3
Plotted By: 1024	Ref ID: *1024_26032020113859*

A3

ORLAGH VIEW

Airpark Avenue

STOCKING AVENUE

Stocking Hill

Green Acres House

PLANT REQUESTED FROM eircom emaps CBYD SERVICE

https://cbyd.emaps.eircom.ie/

Scale: 1:1500

Irish National Grid Co-Ordinates
Centre XY: 312686 m, 226120 m

Date
26/03/2020

emaps CBYD

THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND SHOULD NOT BE DISCLOSED TO ANY THIRD PARTY WITHOUT THE EXPRESS WRITTEN CONSENT OF eircom LTD. THE DRAWING IS NOT TO BE PHOTOCOPIED OR REPRODUCED IN ANY WAY

THE INFORMATION GIVEN IS COMPILED FROM RECORDS AND IS BELIEVED TO BE CORRECT. THERE MAY, HOWEVER, BE DEPARTURES FROM THE COURSE[S] AND DEPTH[S] SHOWN OR INDICATED. THERE MAY ALSO BE ITEMS OF eircom PLANT OF WHICH NO RECORDS IN HELD. THE INFORMATION IS GIVEN WITHOUT PREJUDICE TO THE LEGAL RIGHTS OF eircom LTD. TO COMPENSATION SHOULD eircom PLANT BE DAMAGED.

Ordnance Survey Ireland Licence No EN 0007904
Copyright Ordnance Survey Ireland and Government of Ireland

16.0 INTERACTIONS AND CUMULATIVE IMPACTS

16.1 Introduction

This section of the EIAR has been prepared by Tom Phillips + Associates and deals with likely interactions between effects predicted as a result of the proposed development.

In addition to the requirement under the *Planning and Development Regulations, 2001 – 2020*, to describe the likely significant effects of the proposed development on particular aspects of the environment, it is also required to consider the interaction of those effects. As such, these are assessed below.

This Chapter of the EIAR will address the intra-project significant effects (i.e. those occurring between environmental topics within the project). Inter-project effects (i.e. those which are likely to occur as result of the likely impacts of the proposed development interacting with the impacts of other projects in the locality) have also been considered.

We have established a range of planned / permitted projects have the potential to interact to with either the construction or operational phases of the development. These are identified in Table 3.1 of this EIAR.

As noted in previous sections of this EIAR, Ardstone Homes Ltd are in the process of preparing an additional SHD planning application on a site south of White Pines east, known as White Pines Central. The cumulative impacts of the development of both sites in tandem has also been considered in the assessments below.

Further detail relevant to the interaction of impacts may also be found in the earlier chapters of the EIAR.

16.2 Inter-Relationships/ Interactions

It is noted that all aspects of the environment are likely to interact to some extent and to various degrees of complexity. The likely significant interactions between factors arising from the proposed development are set out in the matrix provided as Table 16.1 below.

Matrix of Interactions Between Environmental Factors											
	Archaeology, & Cultural Heritage	Population & Human Health	Biodiversity	Land and Soils	Water & Hydrology	Air Quality/ Climate	Noise & Vibration	Townscape & Visual	Traffic	Waste	Site Services
Archaeology & Cultural Heritage				✓							
Population & Human Health						✓	✓	✓	✓	✓	
Biodiversity				✓	✓	✓	✓	✓		✓	
Land and Soils					✓	✓	✓		✓	✓	
Water & Hydrology											
Air Quality/ Climate									✓		
Noise & Vibration									✓		
Townscape & Visual											
Traffic										✓	
Waste											
Site Services											

Table 16.1: Matrix of Interactions

16.2.1 Interaction between Archaeology & Cultural Heritage and Land & Soils

The interaction between Archaeology & Cultural Heritage and Land & Soils are outlined in Chapters 5 and 8 of the EIAR. Excavation works are proposed on site to provide for site works, as detailed in Chapter 8.

There is potential for previously unrecorded archaeological features to be located at the site, impacts on any such remains may range from moderate to profound direct adverse. As noted in Chapter 5, all topsoil stripping outside of the areas of previous disturbance will be monitored by a suitably qualified archaeologist. Full provision will be made for the resolution of any archaeological features/deposits that may be discovered.

Therefore, there are no predicted impacts to any known archaeological remains or recorded monuments during the construction phase of the proposed development.

16.2.2 Interactions between Population & Human Health and Air Quality and Climate

Interactions between air quality and human beings are outlined in Chapter 6 and Chapter 11. An adverse impact to air quality during either the construction or operational phases has the potential to cause health impacts and dust nuisance issues. The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust and PM10/PM2.5 emissions. While there are between 10 – 100 sensitive receptors less than 20 meters from the proposed development, the predicted impacts on human health are low**.**

The dust mitigation measures that will be put in place on-site during construction will ensure that the impact of the development complies with all ambient air quality legislative limits and therefore the predicted impact is short-term and imperceptible with respect to air impacts on human health during the construction phase.

In relation to interactions between air quality and human health during the operational phase, the results of the quantitative assessment conducted to assess the air quality and climate impacts from changes in traffic flows during the operational phase of the assessment demonstrate that the impacts will be long-term and imperceptible. As noted in Section 11.4.2.3 of this EIAR;

> *"…emissions as a result of the proposed development are compliant with all National and EU ambient air quality limit values which are set for the protection of human health and therefore, will not result in a significant impact on human health. Impacts to human health during operation are deemed long-term, neutral and imperceptible."*

As noted above and further detailed in Section 11.2.1.2 of this EIAR, results show that concentrations of ambient air pollutants with the proposed development in place will be compliant with all ambient air quality limit values which are based on the protection of human health.

> *"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 (PM2.5) and the EU ambient air quality standards outlined in Table 11.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$"*

16.2.3 Interactions between Population & Human Health, Traffic and Noise & Vibration

There is the potential for noise and vibration arising from the subject scheme to interact with other aspects of the environment, particularly traffic, population and human health. In order to minimise the potential for significant effects on the surrounding population, a series of mitigation measures are outlined in Chapter 12 and 14.

These mitigation measures include the use of construction plant and equipment which comply with EU noise emission limits, the use of noise attenuating materials in lorries, skips and chutes, limiting high noise/vibration generating activities and minimising their duration, and adherence to British Standard BS 5228 guidance on minimising noise emissions.

As noted in Section 12.6 of this EIAR, in terms of noise mitigation, the following are some typical measures that may be employed to reduce the effects of noise on the surrounding receptors:

- Use of a standard site hoarding, typically 2.4m height will be erected around the perimeter of the construction site for the duration of works;
- Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- Monitoring levels of noise and vibration during critical periods and at sensitive locations;
- Maintaining site access roads even so as to mitigate the potential for vibration from lorries;
- Selection of plant with low inherent potential for generation of noise and/ or vibration;
- Erection of barriers as necessary around items such as generators or high duty compressors;
- Situate any noisy plant as far away from sensitive properties as is reasonably practicable and the use of vibration isolated support structures where necessary;
- Establishing channels of communication between the contractor/developer, Local Authority and residents, and;
- Appointing a site representative responsible for matters relating to noise and vibration.

It is considered that the implementation of the mitigation measures, discussed in detail in Section 12.6, will minimise the potential for significant effects on the surrounding population.

16.2.4 Interactions between Population & Human Health and Landscape & Visual Impact

Interactions between Population & Human Health and Landscape and Visual Impact are outlined in Chapter 6 and 9.

During construction stage, potential visual impacts are related to temporary works, site activity, and vehicular movement within and around the subject site. Vehicular movement may increase in the immediate area, and temporary vertical elements such as cranes, scaffolding, site fencing/hoarding, gates, plant and machinery etc., will be required and put in place. All construction impacts on the population arising from visual impact will vary from moderate and neutral to significant and negative, depending on one's location, the stage of construction, and the intensity of site activity at the time. These effects will be of short-term duration.

At operation stage, the designed scheme seeks to harmonise and integrate the development within the existing landscape and the broader environment. The impact on population arising from visual impact is outlined in Chapter 9 for each selected view.

16.2.5 Interactions between Population & Human Health and Traffic

Interactions between Population & Human Health and Traffic are outlined in Chapter 6 and Chapter 14. During the construction & demolition stage of the project the potential impacts to population and human health will primarily be from onsite (plant and vehicle movement) and the increase in offsite plant and traffic movements. A Construction Traffic Management Plan (CTMP) has been prepared by DBFL, submitted with this application, which incorporates a range of integrated control measures and associated management activities with the objective of minimising the impacts of construction activities associated with the development. Provided the proposed mitigation measures and management procedures are incorporated during the construction phase, the impact on human health of the local receiving environment will be moderate, neutral in terms of quality and shot term.

Following completion of the development, potential impacts will occur due to the increase in traffic movements from residential and commercial traffic using the internal roads and parking of the development and the surrounding routes for ingress and egress. Impacts and the increase in traffic numbers are included in section 14.7 of this EIAR. Mitigation measures have been identified, included in section 14.6 of this EIAR, to off-set the additional local demand that the proposed residential development at the subject site could potentially generate as a result of the forecast increase in vehicle movements by new residents.

The implementation of the mitigation measures outlined within Chapter 14 will ensure that the residual effect on the local receiving environment is both managed and minimised.

The overall impact to human health from the increase in traffic movement from the proposed development is neutral, not significant and long-term.

16.2.6 Interactions between Population & Human Health and Waste

Interactions between Population & Human Health and Waste are outlined in Chapter 6 and Chapter 13 of the EIAR. The potential impacts on human beings in relation to the generation of waste during the construction and operational phases are that incorrect management of waste could result in littering which could cause a nuisance to the public and attract vermin.

A carefully planned approach to waste management is included in the Construction and Demolition Waste Management Plan (CDWMP) and the Operational Waste Managament Plan (OWMP), prepared by AWN (appended to this EIAR). This will ensure appropriate management of waste and avoid any negative impacts on the local population. As such the predicted impacts are expected to be long-term, imperceptible and neutral.

16.2.7 Interactions between Biodiversity and Water & Hydrology

Interactions between Biodiversity Water and Hydrology could arise during both the construction phase and the operational phase.

During construction Surface water will be managed in accordance with the measures set out in Chapter 10. This will ensure that soiled water does not have a significant impact on water quality outside to the site boundaries.

The surface water drainage system proposed as part of the development has been designed in line with best practice Sustainable Urban Drainage Systems (SuDs) methods. Surface water from the site will be discharged via a petrol interceptor and attenuation tank to an existing 375mm diameter surface water drain (which runs along the site's northern boundary) at a controlled greenfield runoff rate of 4.6 L/Sec/Ha. This will ensure that the proposed development will not increase the risk of flooding or water pollution downstream of the proposed development. For further information please refer to Chapter 10 of the EIAR.

A Site-Specific Flood Risk Assessment for proposed development was undertaken in accordance with the requirements of *"The Planning System and Flood Risk Management, Guidelines for Planning Authorities*" and its technical appendices. This has been appended to Chapter 10 of the EIAR and concludes that the site is not prone to flooding.

The predicted impacts of the interactions between Biodiversity and Water are expected to be long-term, imperceptible and neutral.

16.2.8 Interactions between Biodiversity and Air Quality

Interactions between Biodiversity and Air Quality are outlined in Chapter 7 and Chapter 11. The construction and operation of the proposed development has the potential to generate emissions to atmosphere which have the potential to impact on sensitive flora, fauna and water environments. However, the effect of these emissions will not be significant during either the construction or operational phases of the development. Mitigation measures implemented during the construction phase, as outlined in the CDWMP appended to this EIAR, will ensure that the deposition of dust is minimised and therefore the predicted impact from air (including dust) emissions on ecology and water environments during construction will be short-term and not significant.

In the operational phase, the predicted impacts on air quality will not exceed the air quality criteria set down for ecologically sensitive sites as outlined in Transport Infrastructure Ireland guidance and, therefore, the proposed development will have a long-term and imperceptible impact.

16.2.9 Interactions between Biodiversity and Noise & Vibration

Biodiversity interactions with Noise and Vibrations may arise during the construction phase with the demolition of the existing buildings and excavation works. Noise and Vibration interactions are relatively minor in this instance, given the ecological context of the site. Measures outlined in the Biodiversity Management Plan, prepared by Altemar submitted with this application, will adequately address any potential biodiversity impacts.

16.2.10 Interactions between Biodiversity and Landscape & Visual Impact

Interactions between Biodiversity and Landscape and Visual Impact are outlined in Chapter 7. During the operational phase, biodiversity enhancement measures which are outlined in the landscaping plans will result in a positive, slight and long term impact.

16.2.11 Interactions between Biodiversity and Waste

Biodiversity interactions with Waste Management may arise during the construction phase when soil and demolition wastes are being transported from the site. Measures outlined in the Biodiversity Management Plan, prepared by Altemar, will be implemented. This will minimise any interactions and limit any impacts to temporary, imperceptible and neutral.

16.2.12 Interactions between Land & Soils and Hydrology

Interactions between Land & Soils and Hydrology are outlined in Chapter 8 and Chapter 10. Interactions with Water and Hydrology arise during the construction phase and the operational phase. Surface water from the site will be discharged to existing surface water sewers. A site-specific CMP, prepared by DBFL, will manage site water during the construction phase. Surface water drainage from the operational site will be designed in accordance with Greater Dublin Strategic Drainage Study, and SuDs methods will be used to manage drainage. Surface water discharge rates will be controlled by a Hydrobrake type vortex control device in conjunction with attenuation storage. Arising from the above measures, there is no anticipated impact between Land & Soils and Hydrology.

16.2.13 Interactions between Land & Soils and Air & Climate

Interactions between Land & Soils with Air and Climate arise during the construction phase when dust may be generated. Assessment and mitigation for this is outlined in Chapter 11. It is considered that the implementation of the mitigation measures described within Chapter 11 will minimise the potential for significant effects on Air Quality in the area.

16.2.14 Interactions between Land & Soils and Noise & Vibration

Interactions between Land & Soils and Noise & Vibration arise during the construction phase when demolition of the existing buildings will be competed and soil and subsoils and demolition wastes are being transported from the site, and raw materials for construction are being imported to the site. A Construction Traffic Management Plan (CTMP), will be implemented in order to minimise the disturbance caused by traffic.

All construction activities will be governed by a CTMP, the details of which will be agreed with South Dublin County Council prior to the commencement of construction activities on site.

It is considered that the implementation of measures outlined in the CTMP will minimise the potential for significant effects on Air Quality in the area.

16.2.15 Interactions between Land & Soils and Traffic and Transportation

Interactions between Land & Soils with Traffic and Transportation arise during the construction phase when soil and subsoils and demolition wastes are being transported from the site, and raw materials for construction are being imported to the site. As noted above, a CTMP will be implemented in order to minimise the disturbance caused by traffic.

It is considered that the implementation of measures outlined in the CTMP will minimise the potential for significant effects on Traffic and Transportation in the area.

16.2.16 Interactions between Land & Soils and Waste

Interactions with Waste Management arise during the construction phase when soil and subsoils and demolition wastes are being transported from the site. These waste materials will require appropriate transport and disposal.

Topsoil and subsoil excavated to facilitate site preparation, construction of foundations, and the installation of underground services. The project engineers have estimated that c. 10.000m^3 of material will require excavation. It is envisaged that some of this material will be removed offsite site in with c. 2,500m^3 expected to be kept for onsite reuse. These estimates will be refined prior to commencement of construction.

As noted in Section 13.4 of the EIAR, if the material that requires removal from site is deemed to be a waste, removal and reuse/recycling/recovery/disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery/disposal will dictate whether a Certificate of Registration (COR), permit or licence is required for the receiving facility. Alternatively, the material may be classed as by-product under Article 27 classification (European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011).

Adherence to the mitigation measures in Chapter 13 and the requirements of the C&D WMP, will ensure the effect is long-term, imperceptible and neutral.

16.2.17 Interactions between Air Quality and Traffic

Interactions between Air Quality and Traffic are outlined in Chapter 11 and Chapter 14. Traffic data for the local road links affected by the proposed development and nearby developments for the opening and design years was provided for both the Do Nothing and Do Something Scenarios. This information has been used as an input for the air quality and climate assessment of the operational phase of the proposed development. The results of this assessment predict that the impacts to air quality and climate from a change in traffic flows as a result of the proposed development will be long-term and imperceptible.

16.2.18 Interactions between Traffic and Waste

Interactions between Traffic and Waste are outlined in Chapter 14 and Chapter 13. Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the development. The increase in vehicle movements as a result of waste generated during the construction phase will be temporary in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be imperceptible in the context of the overall traffic and transportation increase and has been addressed in Chapter 14 Traffic and Transportation. Provided the mitigation measures detailed in Chapter 14 and the requirements of the OWMP (included as Appendix 13.2) are adhered to, the effects should be short to long-term, imperceptible and neutral.

17.0 MITIGATION MEASURES

The chapters contained within this EIAR have been ordered in a grouped format by their relevant topic. This chapter summarises all mitigation measures proposed in order to provide a comprehensive overview of the full range of mitigation measures discussed within each chapter.

For clarity, the *EPA Guidelines (2017)* define mitigation measures as those *"measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements".*

17.1 Archaeology, Architectural & Cultural Heritage

As noted in section 5.5 of the EIAR, given the site has not yet been developed the following measures will be implemented during the construction phase of the development;

> *"All topsoil stripping outside of the areas of previous disturbance will be monitored by a suitably qualified archaeologist. Full provision should be made for the resolution of any archaeological features/deposits that may be discovered, should that be deemed the appropriate way to proceed.*
>
> *A written and photographic record of the surviving elements of Woodtown Lodge demesne (DL 1) will be carried out prior to the construction of the proposed development."*

17.2 Population and Human Health

There may be a short term slight negative impact on the local residential population during the construction phase and the operational phase (as described in section 6.6.2 and Chapter 12 – Noise and Vibration). However, no significant negative impacts have been identified in relation to the provision of a residential development at a site zoned for such development and as such, no mitigation measures are required.

17.3 Biodiversity

The following mitigation measures will be implemented as part of the proposed project in order to minimise the potential effects on the existing ecology as discussed above.

Mitigation Measures for Designated Sites

- No additional mitigation measures, above and beyond what is outlined in the Biodiversity Management Plan (March 2021), are required for the protection of designated sites.

Mitigation Measures for Habitats and Flora

- All measures outlined in the Biodiversity Management Plan (March 2021) will be fully implemented.
- Tree protection measures will be implemented to protect existing trees which are to be retained. These will be determined in consultation with an Arborist.

- The landscaping plan for the proposed development will be fully implemented.

Mitigation Measures for Fauna

- In advance of work starting on site the works contractor will prepare and agree a Construction Methodology document building upon the outline Biodiversity Management Plan (March 2021), prepared by Altemar.
- As outlined in Appendix 7.1, "As no evidence of a bat roost was noted in any of the onsite, no mitigation measures in regard to these animals are needed during the proposed works. There is also no requirement for a National Parks and Wildlife Service derogation licence application to allow the planned works. Although mitigation measures are not required, as a precaution, as bats are using the treeline as a foraging corridor it is recommended that lighting of this area follows bat lighting guidance.
- All trees required to be felled will be inspected by a bat specialist prior to felling. While the buildings and trees referred to above, currently have no value to roosting bats, it is possible that this may change in the intervening period between survey and commencement of works.
- Gaps will be left (200mm minimum) at point along the base of the site security fencing to allow the free movement of mammal species through the site throughout the construction phase.
- In the event that the demolition and habitat clearance works are scheduled during the bird breeding season (March 1st to August 31st inclusive) the existing building (including rooftops) and trees will be inspected to identify any breeding birds present by a suitably qualified Ecologist. The project Ecologist will ensure that no active nests are removed until the conclusion of the particular nesting attempt.
- While there is no evidence of Swift (*Apus apus*) nesting at the existing site, Swift nesting boxes will be incorporated into the proposed design as an enhancement measure. A minimum of five concrete or concrete-composite next boxes will be installed at suitable locations which are to be decided with the Project Ecologist. Swifts are a migratory species that has suffered declines in recent decades and provision of nesting boxes is intended to be a positive measure in an urban setting.
- Any pooled surface water at the site (e.g. during construction) shall be checked in the period of February-March to record the presence of any breeding Frogs. If spawn and/or tadpoles are present in an area that may be disturbed by activity at the site then Frogs, spawn and tadpoles should be translocated (under licence) by a suitably qualified ecologist to suitable sites in the wider area to be agreed with NPWS.
- During construction, deep excavations or areas of pooled water will be assessed on an ongoing basis to either provide escape ramps for fauna or adequate mammal-proof fencing of a minimum of 1.2m in height. Any temporary excavations will be checked on a daily basis during working periods to minimise the risk of animals becoming trapped.
- All edible and putrescible wastes will be stored and disposed of in an appropriate manner. Similarly, all construction materials will be stored and stockpiled at planned locations.

17.4 Land and Soils

17.4.1 Construction Phase

The potential impacts due to the removal of soils and subsoils can be mitigated in several ways. Controlling working practices to avoid repetitive handling of excavated made ground

and subsoils, minimise vehicle movements and limit the size of stockpiles will reduce the compaction and erosion of material and generation of dust.

Soils and subsoils at the site have been classified as non-hazardous, excavation and transport off site, will still require the material to be transported under appropriate licence to an appropriate facility under either the LoW (List of Waste) codes 17 05 04 or 17 09 04.

If temporary storage of excavated made ground and subsoils is required it will be carefully managed to prevent potential negative impact on the receiving environment, the stockpiled material will be covered and stored away from any surface water drains. It will be necessary to designate areas within the site where stockpiles will be established in order to facilitate the efficient transfer of material within the site. It will also be necessary to position spoil and temporary stockpiles in locations which are at least 15 m distant from drainage systems.

Excavation shall be restricted in times of high winds and heavy rainfall to minimise the potential for dust generation or uncontrolled sediment movement. Good construction practices will also be used during the construction phase, such as wheel washers and dust suppression at site access points.

Imported Fill
The source of aggregate, fill material and topsoil imported to site will be carefully selected and vetted in order to ensure that it is of a reputable origin and that it is "clean" (i.e. will not contaminate the environment). Project contract and procurement procedures will be developed to ensure that aggregate, fill material and topsoil are acquired from reputable sources with suitable environmental management systems as well as regulatory and legal compliance.

Construction Traffic
As noted in Chapter 14 of this EIAR, a Construction Traffic Management Plan will be implemented in order to minimise the disturbance caused by large vehicles.

17.4.2 Operational Phase

The operational phase of the development is unlikely to have any significant adverse impacts on the local geological / hydrogeological environment due to the environmental considerations incorporated into the design.

17.5 Landscape and Visual Impact

17.5.1 Construction Phase

The building site including a site compound with site offices, site security fencing, scaffolding and temporary works will be visible during the construction phase. The provision of site hoarding along the property boundaries will substantially address many potential effects of construction operations at ground level during the delivery stage. Construction cranes (and of course, the emerging buildings) will become visible from neighbouring properties and also from a number of more distant vantage points as the development proceeds. The cranes and site facilities are generally viewed as a temporary and unavoidable feature of construction, particularly in urban settings. Mitigation measures proposed during the construction stage of the development, revolve primarily around the implementation of appropriate site management procedures during the construction works – such as the control of lighting,

storage of materials, placement of compounds, control of vehicular access, and effective dust and dirt control measures, etc. The Preliminary Construction Management Plan, prepared by DBFL, is submitted with the planning application, setting out the basic measures to be employed in order to mitigate potential negative effects during construction. This is a working document which is refined and added to as the project proceeds.

17.5.2 Operational Phase

The designed scheme seeks to harmonise and integrate the development within the existing landscape and the broader urban environment whilst adhering to national planning policy which seeks the densification and the provision of increased height on appropriate urban sites. The design rationale and detail employed seeks to mitigate potential negative effects on the landscape character and visual amenity of the area by:

- Establishing an integrated relationship between the proposed development and surrounding buildings and the broader urban landscape beyond, incorporating aspects of current and emerging trends in built-form, scale, texturing, colour and materials;
- The insertion, positioning and detailed modelling of the buildings, in order to assist in the appropriate visual assimilation of their mass
- Appropriate architectural detailing to assist in the integration of the external building facades – including the modulation of openings and fenestration;
- Rationalisation of all services elements and any other potential visual clutter and its incorporation internally within building envelopes (as far as practically possible);
- Simplification and rationalisation of the proposed roof lines;
- Use of appropriate materials;
- The provision of significant additional public space;
- The provision of communal/public uses within the development;
- Pedestrian and cycle facilities and linkage are proposed as an integral feature through the proposed scheme.

17.6 Hydrology

The following measures are proposed during the construction and operational phases of the development to mitigate against risks to the surrounding hydrological environment, as detailed in Section 10.5.

17.6.1 Construction Phase

- A site-specific Construction and Environment Management Plan has been developed and will be 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 included with this this EIAR.
- 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 to the surface water network at a controlled rate.
- Weather conditions and typical 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 should 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 (at authorized concrete batching plant in full compliance with relevant planning and environmental consents).
- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
- 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 tankered 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 protected from contamination by any construction activities or materials.

17.6.2 Operational Phase

As noted in Section 10.6.2 of this EIAR, a site Specific Flood Risk Assessment (FRA) has been prepared by DBFL, submitted with this application. As noted in the FRA, the development site is located in Flood Zone C as defined by the Guidelines i.e. proposed development is considered to have the required level of flood protection up to and including the 1% AEP flood event.

Proposed mitigation measures to address residual flood risks are summarised below;

- Proposed drainage system to be maintained on a regular basis to reduce the risk of a blockage.
- In the event of storms exceeding the 1% AEP design capacity of the attenuation system, possible overland flow routing towards open space areas should not to be blocked.

17.7 Air and Climate

17.7.1 Construction Phase

Air Quality

As outlined in Section 11.5 of the EIAR, the pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the dust management plan. The key aspects of controlling dust are listed below. Full details of the dust management plan can be found in Appendix 11.3 and Section 9 of the Construction and Environmental Management Plan, prepared by DBFL, appended to this EIAR.

- The Contractor shall prepare a dust minimization plan which shall be communicated to all site staff;
- 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 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 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;
- Vehicles delivering material with dust potential (soil, aggregates etc.) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- Public roads outside the site will be inspected on a daily basis for cleanliness and cleaned as necessary;
- Debris, sediment, grit etc. captured by road sweeping vehicles is to be disposed off-site at a licensed facility;
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate prior to entering onto public roads;
- Material handling systems and site stockpiling of materials will be designated 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 or 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, the procedures within the plan will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

Monitoring of dust deposition levels (via the Bergerhoff method) shall take place at a number of locations at the site boundary of the development to ensure dust nuisance is not occurring at nearby sensitive receptors. This monitoring aims to ensure that the dust mitigations measures are being implemented properly throughout the site.

Climate

Construction traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the proposed development. Construction vehicles, generators etc., may give rise to some CO_2 and N_2O emissions. However, based on the short-term nature and moderate scale of the works, the impact on climate will not be significant.

Nevertheless, some site-specific mitigation measures can be implemented during the construction phase of the proposed development to ensure emissions are minimised. In particular, the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

17.7.2 Operation Phase

The operational phase air quality impact is considered imperceptible and therefore no site specific mitigation measures are required.

17.8 Noise and Vibration

17.8.1 Construction

As detailed in Section 12.6 of the EIAR, best practice control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) *Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2*. Predictions indicate that significant construction noise impacts are expected to occur during the demolition and site clearance phase when work is ongoing at boundary locations adjacent to noise sensitive locations, hence the contractor will ensure that all best practice noise and vibration control methods will be used. In this regard, various mitigation measures will be applied during the construction of the proposed development, such as:

- Use of a standard site hoarding, typically 2.4m height will be erected around the perimeter of the construction site for the duration of works;
- Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- Monitoring levels of noise and vibration during critical periods and at sensitive locations;
- Maintaining site access roads even so as to mitigate the potential for vibration from lorries;
- Selection of plant with low inherent potential for generation of noise and/ or vibration;
- Erection of barriers as necessary around items such as generators or high duty compressors;
- Situate any noisy plant as far away from sensitive properties as is reasonably practicable and the use of vibration isolated support structures where necessary;
- Establishing channels of communication between the contractor/developer, Local Authority and residents, and;
- Appointing a site representative responsible for matters relating to noise and vibration.

17.8.2 Operational Phase

As part of the detailed design of the development, plant items with appropriate noise ratings and, where necessary, appropriately selected remedial measures (e.g. enclosures, silencers etc.) will be specified in order that the adopted plant noise criteria is achieved at the façades of noise sensitive properties, including those within the development itself.

17.9 Waste

Mitigation measures relating to the control of waste are set out in detail in section 13.6 of the EIAR, as follows.

17.9.1 Construction Phase

As noted above, a project specific C&D WMP has been prepared in line with the requirements of the requirements of the guidance document issued by the DoEHLG and is included as Appendix 13.1 of this EIAR.

A quantity of soil, stone, gravel and clay which will need to be excavated to facilitate the proposed development. Project Engineers have estimated that c. 10,000m^3 of excavated material will need to be removed offsite, however it is envisaged that c. 2,500m^3 excavated material will be reused onsite. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that the following waste types, at a minimum, will be segregated:
  - Concrete rubble (including ceramics, tiles and bricks);
  - Plasterboard;
  - Metals;
  - Glass; and
  - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Article 27 of the EC

(Waste Directive) Regulations (2011). EPA approval will be obtained prior to moving material as a by-product. However, it is not currently anticipated that Article 27 will be used.

These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, the EMR Waste Management Plan (2015-2021). It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources.

17.9.2 Operational Phase

A project specific OWMP has been prepared and is included as Appendix 13.2 of this EIAR. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the EMR Waste Management Plan 2015 – 2021 and abiding by the DCC waste bye-laws. In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
  - Organic waste;
  - Dry Mixed Recyclables;
  - Mixed Non-Recyclable Waste;
  - Glass;
  - Waste electrical and electronic equipment (WEEE);
  - Batteries (non-hazardous and hazardous);
  - Cooking oil;
  - Light bulbs;
  - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
  - Furniture (and from time to time other bulky waste); and
  - Abandoned bicycles.
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter* Pollution *Act 1997*, the *EMR Waste Management Plan (2015 - 2021)* and the SDCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

17.10 Traffic and Transportation

17.10.1 Mitigation Measures

Mitigation measures relating to Traffic and Transportation are detailed in Chapter 17 of this EIAR.

Construction Stage

A preliminary Construction Management Plan has been prepared by DBFL, appended to this EIAR with an associated Construction Traffic Management Plan (CTMP) which incorporates a range of integrated control measures and associated management activities with the objective of minimising the impacts of the construction activities associated with the development. The following initiatives will be implemented to avoid, minimise and/or mitigate against the anticipated construction impacts:

- Prescribed and agreed working hours;
- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and adjacent roads;
- Dedicated construction haul routes for incoming materials will be identified and agreed with South Dublin County Council prior to commencement of activities on-site;
- Delivery vehicles to and from the site will be spread across the working day to ensure the number of HGVs travelling during the peak hours will be relatively low;
- Where possible construction team members will be brought to/from site in vans/minibuses, which will serve to reduce trip generation potential;
- Appropriate on-site parking arrangements for construction personnel to prevent overspill parking on the local road network;
- 'Way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas;
- Site entrance point/s from the public highway will be constructed with a bound, durable surface capable of withstanding heavy loads and with a sealed joint between the access and public highway. This durable bound surface will be constructed for a distance of 10m from the public highway;
- Truck wheel wash facilities will be installed at construction entrances and any specific recommendations with regards to construction traffic management made by South Dublin County Council will be adhered to;
- Road cleaning and sweeping measures to be put in place if required;
- Potential localised traffic disruptions during the construction phase will be mitigated through the implementation of industry standard traffic management measures. These traffic management measures shall be designed, implemented and maintained in accordance with the Department of Transport's Traffic Signs Manual "Chapter 8 Temporary Traffic Measures and Signs for Roadworks" and "Guidance for the Control and Management of Traffic at Roads Works – 2nd Edition" (2010);
- Material storage zone will be established in the compound area and will include material recycling areas and facilities; and

- On completion of the works, all construction materials, debris, temporary hardstands etc. from the site compound will be removed off-site and the site compound area reinstated in full on completion of the works.

Operational Stage

In order to promote and maximise sustainable transportation modes, cycle parking has been provided at a rate which exceeds South Dublin County Development Plan (2016-2022) minimum standards which may act as a facilitator for the growth of Cycle trips undertaken for short to medium distance trips to/from the site, whilst apartment vehicle parking spaces have been provided at a rate slightly below the Department of Housing, Planning and Local Government's Sustainable Urban Housing: Design Standards for New Apartments Guidelines (0.81/unit), which is lower than those outlined in the South Dublin County Development Plan 2016-22.

The increase in cycle parking provisions, and simultaneous reduction in vehicle parking provisions for apartment units aim to increase the number of cycle trips taken and therefore encourage a modal split shift towards cycling for short to medium distance trips. Furthermore, the proposed pedestrian access points and pedestrian linkages to/from the subject site will also encourage and support the uptake walking trips for short to medium distance trips.

17.11 Site Services

Mitigation measures relating to Material Assetsare set out in detail in section 15.5 of the EIAR, as follows.

Construction Phase

Implementation of measures outlined in Section 15.5.1 will ensure that the potential impacts of the proposed development on site services do not occur during the construction phase and that any residual impacts will be short term. These are as follows:

- Contractor to prepare Method Statement detailing proposals for works in the vicinity of existing utilities (method statement to be agreed with PSDP).
- Contractor to locate and record all services on site prior to commencement of excavations.
- Connections to the existing power, gas and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.
- Contractor to comply with HSA Code of Practice for Avoiding Danger from Underground Services.
- Contractor to obtain utility company network plans and arrange observation as required.
- Contractor/PSCS to implement safe systems of construction including but not limited to battering the sides of trench excavations and installation of trench shoring systems.
- Contractor to prepare and implement a Construction Traffic Management Plan.
- Contractor must supervise vehicle movements to and from the site during construction in order to ensure that this traffic management plan is fully implemented. Plan to include deliveries to the site, staff parking, works outside the defined site such as utility connections.
- Public pedestrian routes to be established at site entrance as required.

- Contractor to prepare Method Statement for works in confined spaces, method statement to be agreed with PSDP. Contractor to comply with HAS Code of Practice for Working in Confined Spaces.
- All personnel using machinery/plant to have undergone training on the use of said machinery/plant. Ongoing site supervision to be undertaken to ensure all use of machinery/plant is in accordance with the training undertaken.

Operational Phase

Demand from the proposed development during the operational phase is not predicted to impact on the existing power, gas and telecoms network.

18.0 DIFFICULTIES ENCOUNTERED

No significant difficulties, in terms of technical deficiencies or lack of sources of information, were encountered in compiling the specified information contained in the Statement.

Baseline surveys we're undertaken in advance of the ongoing Covid-19 restrictions, which were first introduced in Ireland on 12th of March and remained in place at the time of submitting this application. As such, the Covid-19 restrictions did not have any substantial impact of the preparation of this EIAR.

References to published sources of information are acknowledged in the text. In addition, studies commissioned specifically for the purposes of this Environmental Impact Assessment Report are also referenced. A list of all consultants involved in the compilation of information for this EIAR is provided in Chapter 1.

As the proposed development will not require the use of natural resources that are in short supply, nor will the development result in the emission of pollutants that will create nuisance or hazard, the matters referred to in Schedule 6(2)(c) of the *Planning and Development Regulations, 2001* (as amended) do not apply.

The full impact analysis was carried out by experienced consultants and the best available methods were employed to forecast environmental effects.

APPENDIX 1 - COMMUNITY FACILITY AUDIT

COMMUNITY INFRASTRUCTURE AUDIT – STOCKING AVENUE

FOR ASSESSMENT OF PROPOSED COMBINED RESIDENTIAL DEVELOPMENT ON LANDS KNOWN AS 'WHITE PINES NORTH, SOUTH, EAST AND CENTRAL' ALL LOCATED AT STOCKING AVENUE, BALLYCULLEN, DUBLIN 16



PREPARED FOR:

ARDSTONE HOMES
48 Fitzwillam Square
Dublin 2
D02 EF89

PREPARED BY:

TOM PHILLIPS + ASSOCIATES
80 Harcourt Street
Dublin 2
D02 F449

IN ASSOCIATION WITH:

VIRTUS PROJECT MANAGMENT
5th Floor
The Glass House
11 Coke Lane
Dublin 7
D07 WNP2

ISSUE DATE: JANUARY 2021

1.0 EXECUTIVE SUMMARY

Ardstone Homes[1] have requested that a community infrastructure audit be undertaken for the assessment of 4 No. distinct residential developments known as 'White Pines North, South East and Central' all located at Stocking Avenue, Ballycullen, Dublin 16. The combined development is expected to comprise a maximum of 659 No. units, including 151 No. 1-bedroom units, 198 No. 2-bedroom units, 151 No. 3-bedroom units, 132 No. 4-bedroom units and 27 No. 5-bedroom units along with all associated car parking, landscaping and service works once completed, as indicated in Table 1.1.



Figure 1.1: Indicative Site Location Plan, prepared by TPA, 2021.

Table 1.1: Proposed Schedule of Accommodation – Combined Developments						
Unit Type	***North***	***South***	***East[2]***	***Central***	***Combined***	***% of Total***
1-bed units	-	-	93	58	**151**	**23%**
2-bed units	-	-	148	50	**198**	**30%**
3-bed units	81	41	-	29	**151**	**23%**
4-bed units	84	48	-	-	**132**	**20%**
5-bed units	10	17	-	-	**27**	**4%**
Total Units	**175**	**106**	**241**	**137**	**659**	**100%**

[1] Ardstone Homes, 48 Fitzwilliam Square, Dublin 2, D02 EF89
[2] Subject Application.

1.2 Social Infrastructure Audit Methodology

With respect to this development, Ardstone Homes has requested that a Social Infrastructure Audit be undertaken by Tom Phillips + Associates (TPA) for the site, using geospatial survey methods. This survey was conducted in April 2020 (and subsequently updated in October 2020) and identified more than 150 No. relevant social infrastructure facilities in the vicinity of the subject proposal for further assessment. A large number of public and private geospatial datasets were used in the course of the survey, including but not limited to:

- 2016 and 2011 Census Boundaries and Statistics
- 2020 Eircode Address Database (ECAD)
- 2020 OSM Ireland POI Datasets
- 2020 OSi and ESRI Ireland Basemaps
- 2019-2020 Department of Education and Skills - Irish Schools
- 2020 Department of Education and Skills - Providers of Higher Education
- 2020 QQI Register of Private Higher Education Institutions in Ireland
- 2020 Tusla Early Years Inspectorate Reports – Registered Childcare Facilities
- 2020 HSE Records – 'Find Your Local Health Service'

This survey demonstrated that there is an adequate supply of education, childcare, community and religious facilities within c. 10-minutes' drive of the subject lands, and as well as a variety of public parks and amenity areas, playgrounds and sporting facilities.

Potential gaps in the existing service provision of the area are limited to higher order healthcare facilities, such as hospitals, and more significant arts and cultural facilities. We note that the combined development scheme (i.e., White Pines North, South, East and Central) includes a range of residential support and public amenities, as follows:

- **White Pines North** – Planning permission was previously granted for a 172 sq. m crèche facility at this location by Ref. SD14A/0222 and subsequently amended; however, a larger childcare service is now proposed to be provided as part of the permitted neighbourhood retail centre development adjoining White Pines South (see details in section to follow).

  The space previously occupied by the crèche in this scheme will be replaced by a sunken grassed area to allow for ball games and less structured play in the White Pines East development. A playground facility has been provided on the southern portion of the site to date, along with a linear park with outdoor work out equipment which forms the northern boundary of White Pines East and White Pines North, as shown below.



Children's Playground



Linear Park

- **White Pines Retail** – Other facilities are also to be provided within the neighbourhood retail centre adjoining White Pines South (permitted under Ref. SD19A/0345), including: a 1,479 sq. m convenience retail unit; some 385 sq. m of crèche services at ground and first floor levels. This grant of permission omitted a 192 sq. m community facility and extended the crèche to the second-floor level. For this reason, a community building has been provided as part of the current proposals on the White Pines East site, on the ground floor of Block A, with 552 sq. m provided.

  We note that a 2020 amendment application (Ref. SD20A/0322) has been submitted for this development, which will provide a modified 1306 sq. m of retail space at ground and mezzanine levels, 113 sq. m of retail store, 269 sq. m of ancillary retail staff space and a 591 sq. m crèche at ground, first and second-floor levels (2,279 sq. m of development overall).

- **White Pines East (Subject Application)** – All internal residential amenity services (171 sq. m) are proposed to be provided in one location on the ground floor of Block C, including: lobby/concierge and parcel room; co-working space; lounge, kitchen and private dining space; games and media room; and a gym and yoga room.

  A 552 sq. m community space is also proposed to be provided on the ground floor of Block A, which includes multi-function and meeting rooms for public use. A range of public open spaces are also proposed, including landscaped play elements such as gentle mounds and wildflower plantings.

- **White Pines Central** – All internal residential amenities are proposed to be provided in one location on the ground floor of Block A, including: lobby/concierge and parcel room; a communal residential lounge; games and multi-media room; and a gym and yoga room. A range of landscaped outdoor amenity spaces will also be provided, including designated play spaces for children and a number of informal playing pitches.

2.0 RELEVANT PLANNING GUIDANCE

2.1 Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas

This audit has regard to the *Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (DoEHLG, 2009)* set out the following categories of community infrastructure as being most relevant in the development of new residential areas:

Table 2.1: Community Infrastructure Categories as per DoEHLG Guidelines	
Infrastructure Types	**Sample Facilities**
Schools	Primary, Post-Primary, Special Education, Third-Level Institutions
Childcare	Registered Facilities (Full Time, Part Time, Sessional)
Community Centres	Community Centres, Resource Centres, Sports Centres, Youth Centres, Training Centres. etc
Healthcare Facilities	General Practitioners, Healthcare Centres, Hospitals, Nursing Homes
District Centres	Supermarkets, Shops, Convenience Shops

These criteria were considered in the development of the comprehensive infrastructure categories applied during the course of the study area audit, as set out in Section 4.0 to follow.

2.2 Regional Spatial and Economic Strategy 2019-2031 (EMRA)

We note that the *Regional Spatial and Economic Strategy 2019-2031 (RSES)* prepared by the Eastern & Midland Regional Assembly (EMRA) was published 28 June 2019 and supersedes the previous *Regional Planning Guidelines for the Greater Dublin Area 2010-2022*. This document takes account of the Dublin Metropolitan Area Strategic Plan (MASP), which identifies strategic residential and employment corridors within the area and provides guidance for development opportunities including housing delivery. With respect to the provision of social infrastructure within Dublin City and Suburbs (to which Firhouse/Ballycullen belongs), the RSES advocates for a wide range of services and facilities to meet local need and contribute towards an improved quality of life for all residents, including:

> *"…facilities in relation to health, education, libraries, childcare, community centres, play, youth, recreation, sports, cultural facilities, policing, places of worship, burial grounds and emergency facilities."*
>
> *[Section 9.6, RSES]*

Specific policy objectives for the development of social infrastructure throughout the region are also included in Sections 9.6 and 9.7, as follows:

Table 2.2: Select Regional Policy Objectives for Social Infrastructure (RSES)	
RPO 9.20 Childcare	*Support investment in the sustainable development of the Region's childcare services as an integral part of regional infrastructure to include:* • *Support the Affordable Childcare Scheme.* • ***Quality and supply of sufficient childcare places.*** • *Support initiatives under a cross Government Early Years Strategy.* • ***Youth services that support and target disadvantaged young people** and improve their employability.*
RPO 9.21 Schools	*In areas where significant new housing is proposed, an assessment of need regarding schools' provision should be carried out in collaboration with the Department of Education and Skills and statutory plans **shall designate new school sites at accessible, pedestrian, cycle and public transport friendly locations.***
RPO 9.22 Third Level	*To support the role of Higher Education Institutions and Educational Training Boards in addressing skills shortages and life-long learning needs in the Region, and to **support the further development of multi-campus Technological Universities to drive research and innovation.***
RPO 9.23 Healthcare	*Facilitate the **development of primary health care centres, hospitals, clinics, and facilities to cater for the specific needs of an ageing population** in appropriate urban areas in accordance with RSES settlement strategy and core strategies of development plans.*
RPO 9.24 Arts & Culture	***Promote and facilitate the role of arts and culture** in recognition of its importance to people's identity and the potential for economic development through a unique cultural tourism offering throughout the Region.*
RPO 9.25 Arts & Culture	*Seek to work with all relevant stakeholders to **promote equality of access to and engagement with arts and cultural services** and in the promotion of culture and heritage led urban and rural regeneration.*
	Section 9.6-9.7, RSES - Our emphasis.

2.3 South Dublin County Development Plan 2016-2022 (SDP)

The proposed development area is located within the South Dublin County Council administrative area and therefore this audit also has regard to the policies and objectives contained within the *South Dublin County Development Plan 2016-2022* (SDP), which states the following with respect to the provision of community infrastructure in new developments in Chapter 3:

> *"The overall aim of the Development Plan with regard to community infrastructure is to support the planned provision of accessible community and recreational facilities, parks and open spaces, and* ***to ensure that all communities in South Dublin County have access to a range of facilities*** *that meet the needs of the communities they serve…*
>
> ***Community infrastructure,*** *for the purpose of the County Development Plan,* ***includes community centres and halls, libraries and cultural facilities, religious buildings and burial grounds, sporting facilities, health facilities, childcare and educational facilities, and open space and recreational*** *facilities…"*
>
> *[Ch. 3, SDP –* ***Our emphasis.****]*

Chapter 3 of the *Plan* also contains a number of relevant policies for the provision of social infrastructure in support of sustainable communities, which are referenced in Table 2.3:

Table 2.3: Community Infrastructure Policies (SDP)	
Policy C1 Community Centres	*It is the policy of the Council* ***to ensure that all communities have access to multifunctional community centres*** *that provide a focal point for community activities.*
Policy C2 Libraries	*It is the policy of the Council to continue* ***to provide an innovative, community focused public library service*** *to all who live, work and study in South Dublin County.*
Policy C3 Arts & Cultural	*It is the policy of the Council* ***to facilitate the continued development of arts and culture*** *in the County.*
Policy C4 Places of Worship	*It is the policy of the Council to support and* ***facilitate the development of places of worship and multi-faith facilities*** *at suitable locations.*
Policy C5 Fire Stations	*It is the policy of the Council to co-operate with Dublin City Council in the development of the fire service in the Dublin Region.*
Policy C6 Burial Grounds	*It is the policy of the Council to facilitate the sustainable development of cemeteries and crematoria to cater for the needs of the County.*
Policy C7 Sports Facilities	*It is the policy of the Council* ***to ensure that all communities are supported by a range of sporting facilities*** *that are fit for purpose, accessible and adaptable.*
Policy C8 Childcare	*(a) It is the policy of the Council to support and* ***facilitate the provision of good quality and accessible childcare facilities*** *at suitable locations in the County.* *(b) It is the policy of the Council to require the* ***provision of new childcare facilities in tandem with the delivery of new communities.***
Policy C9 Primary & Post Primary	*(a) It is the policy of the Council to work in conjunction with the relevant education authorities to* ***promote and support the provision of primary and post-primary schools*** *in the County.*

	*(b) It is the policy of the Council to engage with the Department of Education and Skills and to support the Department's School Building Programme by **actively identifying sites for primary and post primary schools at suitable locations**, based on forecast need.*
Policy C10 Third and Fourth Level Education	*It is the policy of the Council **to support the development and ongoing provision of third level education** in the County, and to develop Tallaght as a hub for education and employment to provide further opportunities for the County's workforce.*
Policy C11 Healthcare	*(a) It is the policy of the Council to support the Health Service Executive (HSE) and other statutory and voluntary agencies in the **provision of appropriate healthcare facilities, including the system of hospital care and the provision of community based primary care facilities**.* *(b) It is the policy of the Council to support and **encourage the integration of healthcare facilities within new and existing communities** that are appropriate to the size and scale of each settlement.*
Policy C12 Open Space	*It is the policy of the Council that a hierarchical network **of high-quality open space is available** to those who live, work and visit the County, providing for **both passive and active recreation,** and that the resource offered **by public open spaces, parks and playing fields** is maximised through effective management.*
Policy C13 Accessibility	*It is the policy of the Council to promote the highest levels of **universal accessibility in all community facilities.***
	***Ch. 3, SDP - Our emphasis**.*

2.3.1 Ballycullen-Oldcourt Local Area Plan 2014 (Extended)

The proposed development is also located partially within the *Ballycullen-Oldcourt Local Area Plan 2014 (Extended),* which seeks to:

> *"…ensure that development is phased in a manner that provides for the required community, school and parkland facilities either prior to or in tandem with development."*
>
> *[Section 4.2.2, LAP]*

Other specific objectives for the provision of community infrastructure within the Plan area of relevance to the subject development are included in Appendix 1 of the LAP, as follows:

Table 2.2: Selected Policies for the Development of Community Infrastructure (LAP)	
Open Space	• *All residential development shall **contribute to the creation of the planned network and hierarchy of open spaces**. (Objective GI32).* • *Public open space shall be provided at a minimum rate of 20% of development sites on the Lower Slope and Mid Slope Lands and 30% on the Upper Slope Lands… (Objective GI33).*
Play Areas	• ***Play facilities shall be provided** at a rate of 3 sq.m per dwelling and in accordance with Planning Guidance on Provision of Children's Play Facilities in New Developments (2007) and the Standards section of this LAP (Appendix 2). (Objective GI36).*
Shopping and Community Facilities	• ***All residential development shall provide community floorspace** at a rate of 3 sq. m per 10 dwellings (excluding childcare floorspace). Such floorspace shall be grouped in community facilities and shall be located close to or within local shopping facilities/centres within the Plan Lands. (Objective LUD8).*

	• *The primary locations for community floorspace shall include the Discount Foodstore site zoned Objective 'LC' on the western side of the Plan Lands and the site of the previously permitted Neighbourhood/Community Centre (Reg. Ref. SD05A/1014) on the eastern side. (Objective LUD9).*
Schools	• ***Planning applications for 100 or more dwellings shall be accompanied by a report identifying the demand for school places*** *likely to be generated by the proposal and the capacity of schools in the vicinity to cater for such demand. (Objective LUD11).* • *Each of the two primary school sites designated under this LAP shall measure at least 1.8 hectares and shall each be set aside for the development of a primary school. The Post-Primary School, if provided, shall comply with the minimum space requirements of the Dept. of Education and Skills… (Objective LUD12).*
	Appendix 1, LAP - Our emphasis.

These criteria are addressed with respect to the proposed development in Sections 4.0 and 5.0 to follow, which provide information with respect to the location and level of service provided by existing facilities identified within a c. 1.5km radius of the proposed development site.

3.0 DEMOGRAPHIC ANALYSIS

For the purposes of the demographic analysis, the study area comprises 2 No. distinct enumeration areas identified by the Central Statistics Office (CSO) of relevance to the subject development, as follows: 1) the local Firhouse/Ballycullen Electoral Division (ED) boundary to which the subject site belongs; and 2) the larger South Dublin county administrative boundary. These enumeration areas (identified in Figure 3.1) provide demographic information for the local and regional populations which are likely to be impacted by the subject development and demonstrate historical trends in the various statistical themes explored in the course of this assessment (Sections 3.1 to 3.6 to follow).



Figure 3.1: Extent of CSO enumeration areas utilised in demographic analysis. Location of subject site within the Firhouse-Ballycullen ED indicated by red polygon. Source: CSO, annotated by TPA, 2021.

3.1 Population Trends

The subject site is located within the 'Firhouse/Ballycullen' Electoral District (CSO ED ID: 03012), which comprised some 8,230 No. persons at the time of the 2016 Census. This area appears to be growing at a slightly faster rate (5.9%) than the rest of the county (5.1%) and state (3.8%) for the same period (see Table 3.1a).

More recent population projections for South Dublin were included in the *Regional Spatial and Economic Strategy* (RSES) for the Eastern and Midlands Regional Assembly (EMRA). It is estimated that an additional 40,000-50,000 No. people will need to be accommodated within the local authority by 2031, and an additional 240,000 No. people or more within the larger Dublin Strategic Planning Area (SPA) (see Table 3.1b).

Table 3.1a: Population Change by Enumeration Area (CSO)				
Enumeration Area	**Name**	**2011 Population**	**2016 Population**	**% Change**
Electoral Division	Firhouse/Ballycullen	7,773	8,230	+5.9%
County	South Dublin	265,205	278,767	+5.1%
State	Ireland	4,588,252	4,761,865	+3.8%

Table 3.1b: Population Projections 2016 – 2031 (RSES)			
Location	**2016 Base Year**	**2026 (low-high)**	**2031 (low-high)**
South Dublin	279,000	308,000-314,000	320,500-329,000
Dublin SPA	1,347,500	1,489,000-1,517,500	1,549,500-1,590,000

3.2 Age Profile

The age profile of Firhouse/Ballycullen largely aligns with the county profile, with the Adult (24-64 years) age cohort comprising 56% of the total population within the electoral division. We note, however, that the Secondary School (13-18 years) cohort is slightly higher at 10%, than the rest of the county (8%), and the Older Adults (65+ years) cohort is much lower at 5% than elsewhere (11%).

Table 3.2: Population by Age Cohort (CSO 2016)				
Age Cohort	**Firhouse/ Ballycullen**	**% of Total**	**South Dublin**	**% of Total**
Preschool (0-4 years)	682	**8%**	21,733	**8%**
Primary School (5-12 years)	1,076	**13%**	34,665	**12%**
Secondary School (13-18 years)	786	**10%**	22,270	**8%**
Young Adults (19-24 years)	686	**8%**	19567	**7%**
Adults (25-64 years)	4,615	**56%**	149,607	**54%**
Older Adults (65+ years)	385	**5%**	30,925	**11%**
Total	**8,230**	**100%**	**278,767**	**100%**

3.3 Educational Attainment

With respect to the levels of educational attainment within Firhouse/Ballycullen, the largest proportion of residents had completed 'Third Level' education 50%) in 2016, compared to only 38% in the rest of South Dublin. We note that 17% of the population had also completed 'Post-graduate Education or higher'[3] at the time of the Census, compared to 10% elsewhere, and that less than 1% were recorded as having 'No Formal Education'. These figures indicate a much higher level of educational attainment within the study area than the larger county.

Table 3.3: Population aged 15+ years by highest level of education completed (CSO 2016)

Education Level	Firhouse/ Ballycullen	% of Total	South Dublin	% of Total
No Formal Education	25	**1%**	2727	**2%**
Primary Education	154	**3%**	18045	**10%**
Secondary Education	1,285	**26%**	59,363	**34%**
Third Level Education	2,474	**50%**	65,970	**38%**
Postgraduate or higher	840	**17%**	16582	**10%**
Not stated	139	**3%**	11603	**7%**
Total	**4,917**	**100%**	**174,290**	**100%**

3.4 Economic and Employment

The economic profile of the Firhouse/Ballycullen Electoral Division is similar to the larger settlement, with the majority of the population over the age of 15 being categorized as 'At work' in 2016 (65%). However, the 'Student' (26%) portion of the population is higher in this area than elsewhere in South Dublin (11%) and the 'Retired' portion is slightly lower than the average at 6%. The remaining economic cohorts (e.g., unemployed, homemakers, jobseekers, etc.) each form less than 10% of the population overall.

Table 3.4: Population aged 15+ years by principal economic status (CSO 2016)

Principal Economic Status	Firhouse/ Ballycullen	% of Total	South Dublin	% of Total
At work	4,067	**65%**	119,210	**56%**
Looking for first regular job	32	**<1%**	2,030	**1%**
Unemployed	234	**4%**	16,235	**8%**
Student	978	**26%**	23,833	**11%**
Looking after home/family	411	**7%**	17,074	**8%**
Retired	401	**6%**	27,258	**13%**
Unable to work	87	**1%**	8,427	**4%**
Other	11	**<1%**	612	**<1%**
Total	**6,221**	**100%**	**214,679**	**100%**

[3] Comprised of the following CSO sub-categories: Postgraduate Diploma or Degree, Doct6orate (Ph.D) or higher

3.4.1 Social Class

The majority of workers within Firhouse/Ballycullen were categorized as 'Managerial and technical' workers (46%), followed by 'Non-manual' workers at 19%. Within the electoral division, a larger proportion of the population were categorized as 'Professional workers' (13%) than elsewhere in the county (only 7%), with proportionally lower cohorts of 'Skilled manual' workers (10%) and 'Semi-skilled' workers (4%). This is likely due to the higher levels of educational attainment identified in the area overall.

Table 3.5 Population by social class (CSO 2016)

Social Class	Firhouse/ Ballycullen	% of Total	South Dublin	% of Total
Professional workers	1,045	**13%**	20,429	**7%**
Managerial and technical	3,803	**46%**	79,021	**28%**
Non-manual	1,592	**19%**	53,954	**19%**
Skilled manual	805	**10%**	41,548	**15%**
Semi-skilled	302	**4%**	26,184	**9%**
Unskilled	57	**1%**	8,892	**3%**
All others occupied/unknown	626	**8%**	48,739	**17%**
Total	**8,230**	**100%**	**278,767**	**100%**

3.5 Families and Households

The majority of private households within Firhouse/Ballycullen (63%) and South Dublin (51%) are comprised of 'Families with children', including single and dual parent households. The proportions of 'One person' households (12%) and 'Married/cohabiting couples' (15%) are slightly lower, however, than elsewhere in the county (17% and 18% respectively). All other cohorts (i.e., non-family and mixed households) form less than 5% of the total population.

Table 3.6: Private households by type (CSO 2016)

Type of Households	Firhouse/ Ballycullen	% of Total	South Dublin	% of Total
One person	323	**12%**	15,575	**17%**
Married/cohabiting couple[4]	397	**15%**	16,462	**18%**
Couple with others	26	**1%**	1,423	**2%**
Families with children[5]	1624	**63%**	47,468	**51%**
Families with children and others[6]	112	**4%**	4,385	**5%**
Two or more family units	36	**1%**	2,170	**2%**
Non-family households	33	**1%**	1,842	**2%**
Two or more non-related persons	66	**3%**	3,198	**3%**
Total	2,591	**100%**	92,523	**100%**

[4] Comprised of the following CSO sub-categories: Married couple, Cohabiting couple
[5] Comprised of the following CSO sub-categories: Married couple, Cohabiting couple, Father or Mother and children.
[6] Comprised of the following CSO sub-categories: Couple, Father, or Mother with children and others.

3.5.1 Housing Type and Occupancy

The housing profile of Firhouse/Ballycullen largely aligns with that of South Dublin, with more than 85% of the housing stock comprised of houses and bungalows and 12% of flats and apartments. All other forms of housing comprise 1% or less of the total accommodation stock. We note that the occupancy rate for these units was also much higher than the national average (84%), with more than 94% of all units occupied in both Firhouse/Ballycullen and South Dublin at the time of the 2016 Census (see Table 3.8).

Table 3.7: Private households by type of accommodation (CSO 2016)				
Type of Accommodation	**Firhouse/ Ballycullen**	**% of Total**	**South Dublin**	**% of Total**
House/Bungalow	2,272	**88%**	78,232	**85%**
Flat/Apartment	299	**12%**	12,729	**14%**
Bed-sit	0	**-**	70	**<1%**
Caravan/Mobile Home	0	**-**	130	**<1%**
Not stated	20	**<1%**	1,362	**1%**
Total	**2,591**	**100%**	**92,523**	**100%**

Table 3.8: Occupancy status of permanent dwellings on Census night (CSO 2016)				
Occupancy Status	**Firhouse/ Ballycullen**	**% of Total**	**South Dublin**	**% of Total**
Occupied	2,596	**94%**	92,564	**94%**
Temporarily absent	72	**3%**	2,293	**2%**
Unoccupied holiday homes	0	**-**	35	**<1%**
Other vacant dwellings	78	**3%**	3,495	**4%**
Total	2,746	**100%**	98,387	**100%**

3.6 Demographic Summary

The demographic profile of Firhouse/Ballycullen (i.e. age, economic/social status and education) was largely consistent with the rest of the South Dublin in 2016, however this area appears to be growing at a slightly faster rate (c. 6%) than the rest of the county (5%) or state (3.8%). The majority of residents within the study area are Adults between the ages of 25-64 (56%), however, a much lower percentage of 'Older Adults' were identified within the ED (5%) than the rest of the county (11%).

We note that the population of Firhouse/Ballycullen aged 15 years or older was largely at work (65%) or in school (26%) at the time of the Census, and that a much higher proportion of these residents had completed 'Third Level Education' (50%) or 'Post graduate or higher' (17%) than elsewhere in the county. We note that less than 1% of the total population of Firhouse/Ballycullen had received 'No Formal Education' in 2016.

With respect to household composition, the majority of private households within Firhouse/Ballycullen and the larger settlement are 'Families with children', including single and dual parent households (50% or more), followed by 'One person' and 'Married/cohabiting

couples' households. More than 85% of the total housing stock in the area was comprised of houses and bungalows and 94% of all the permanent dwellings were occupied in both Firhouse/Ballycullen and South Dublin at the time of the Census.

These statistics indicate that a higher proportion of community facilities may be required for the working population and families with school-aged children in this area than other demographic groups. As the majority of children residing in Firhouse/Ballycullen belong to the 'Primary School' cohort (aged 5-12 years, 13%), playground facilities and other recreational amenities for young children are also likely to be desired. We note, however, that the current population figures do not account for the development capacity of additional zoned land within the study area and potential population growth arising from future developments.

4.0 COMMUNITY INFRASTRUCTURE AUDIT

The proposed development site comprises c. 15-hectares of land within the Firhouse/Ballycullen Electoral Division of South Dublin, just outside the M50 motorway. For the purposes of the infrastructure audit, a localised study area was applied which comprises a c. 1.5km radius from the development site, roughly bounded by Firhouse Road to the north, Ballyboden/Edmondstown to the east, Rockbrook/Frank Kelly Park to the south and Oldcourt/Orlagh Park Retreat Centre the west (see Figure 4.1 overleaf).

A total of 8 No. categories of facilities were utilised for during the audit which align with the *Development Plan* requirements for the assessment of community infrastructure and summarise the range of existing amenities and services available to support the proposed development, as shown in Table 4.1. More than 150 No. social infrastructure facilities and services were identified within the study area (as summarised in Figure 4.1 overleaf) and in our opinion, there is sufficient provision of most forms of social infrastructure in the vicinity of the subject site (i.e., within a c. 10-15 minutes' driving distance) to support the proposed development.

Potential gaps in the existing services include higher order healthcare facilities (such as hospitals) and more significant arts and cultural facilities than are currently available. We note that the proposed scheme includes a range of residential support services as well as a number of public amenities including 2 No. community facilities, a substantial 591 sq. m crèche and various public open spaces including children's play areas and informal playing pitches which will positively contribute to the amenity of the area once the development is completed.

Table 4.1: Community Infrastructure Categories applied to Audit

Category	Sample Facilities
Community	Community centres and halls, senior and youth centres/cafes, community gardens and allotments
Libraries/Cultural	Libraries, theatres, museums, music venues, performance and outdoor events spaces
Education	Primary, Post-Primary, Third Level and other lifelong training facilities
Childcare	Registered childcare facilities (Full Time, Part Time, Sessional)
Healthcare	Hospitals, health centres, doctors and clinics, nursing homes
Religious/Burial	Churches, multi-faith centres and burial grounds
Sport/Leisure	Sports centres and clubs, leisure centres, swimming pools
Open Space/ Recreation	Parks, Playing Pitches, Playgrounds, MUGAs

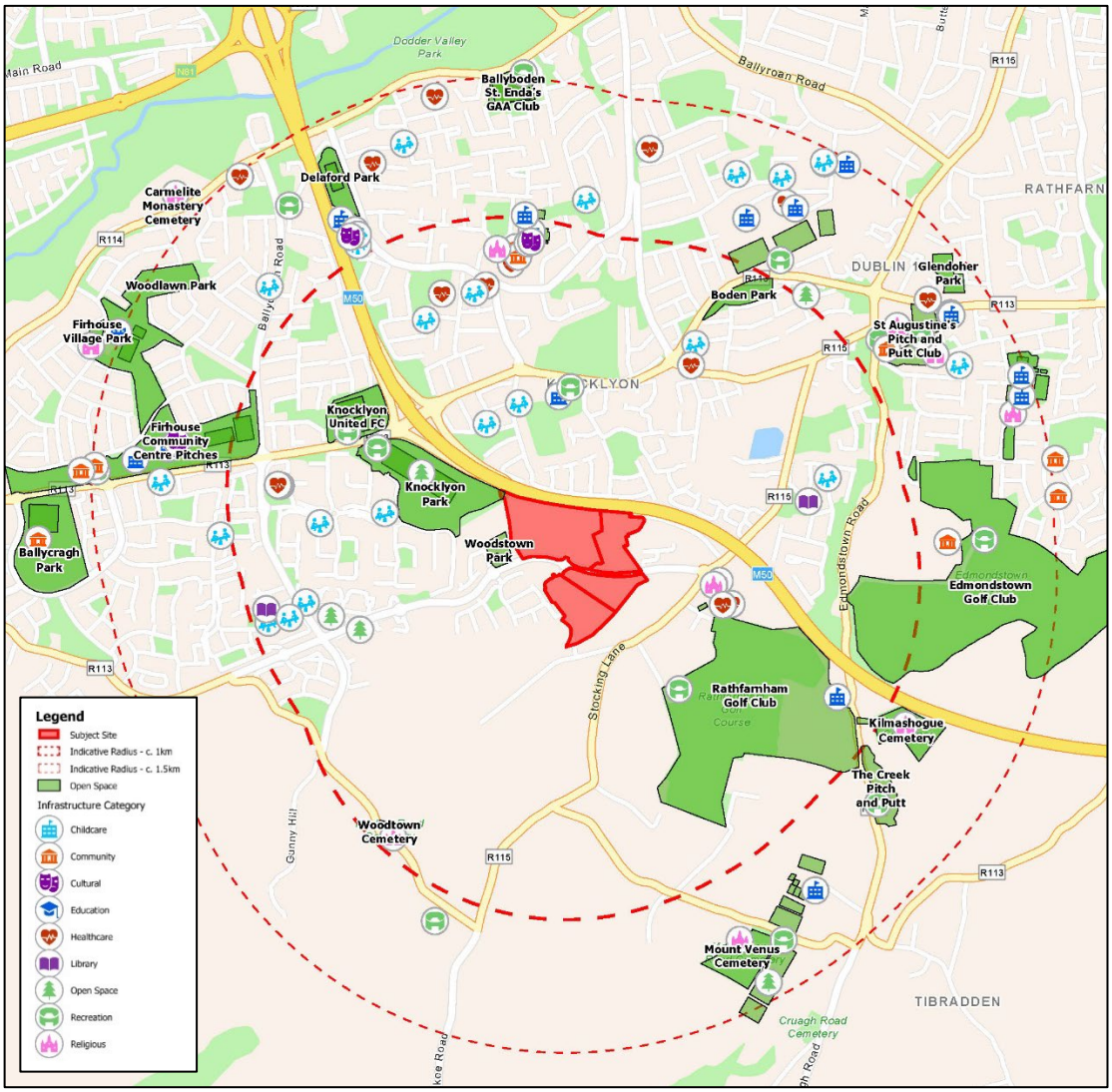


Figure 4.1: Extent of study area comprising a c. 1.5km radius from subject site. Source: TPA, 2021.

4.2 Community Facilities

The proposed development site is supported by a number of local social and community services facilities, including 7 No. community centres and 4 No. youth facilities within the c. 1.5km study area. The Iona Centre and Knocklyon Community & Youth Centre are closest to the subject site, located adjacent St. Colmcille's National School within c. 10 -minutes' drive to the north.



Iona Centre/Knocklyon Community Centre



Ballyboden Family Resource Centre



Firhouse Community & Leisure Centre



Whitechurch Community & Youth Centre

We note that 2 no. food growing facilities were also identified within the study area, including Oldcourt Hill Allotments (located c. 4-minutes' drive to the west) and Edmondstown Park Farm (located c. 6-minutes' drive to the east of the subject site).



Oldcourt Hill Farm Allotments



Edmondstown Park Farm

Table 4.2: Community Infrastructure within c. 1.5km	
Type	**Facilities**
Community Centres and Halls (7)	Ballyboden Family Resources Centre, Firhouse Community & Leisure Club, Daletree Place Community Centre, Knocklyon Youth & Community Centre, Whitechurch Community & Youth Centre, Iona Centre Knocklyon, The Park Community Centre
Senior and Youth Centres/Cafes (4)	St. Augustine's Youth Club, Firhouse Carmel Youth Club, Scouting Ireland (Ballycullen), Scouting Ireland (Knocklyon)
Food Growing (2)	Oldcourt Hill Farm Allotments, Edmondstown Park Farm

4.3 Libraries and Cultural Facilities

There appears to be a limited number of library and cultural facilities available to service the proposed development, with only 1 No. permanent library service identified (Whitechurch Library), supported by 2 No. mobile library stops. Other cultural facilities include the Orlagh House events venue and a small range of arts venues such as South Dublin Music and Encore School of Performing Arts. However, we note that the Red Rua South Dublin Arts Centre, Marley Park outdoor events venue and Pearse Museum are all accessible within c. 5km of the proposed development site.



South Dublin Mobile Library



Whitechurch Library

Table 4.3: Libraries and Cultural Infrastructure within c. 1.5km	
Type	**Facilities**
Libraries (2)	Whitechurch Library, South Dublin Mobile Library Stops (x2 - Hunters Avenue, Prospect Drive) • Others within 2km: Ballyroan Library
Arts and Cultural Facilities (5)	South Dublin Music, Encore School of Performing Arts, Emma Madden School of Ballet, South Dublin Model Railway Club, Mouth and Foot Painting Artists • Others within 5km: Rua Red South Dublin Arts Centre, South Dublin Civic Theatre, Pearse Museum
Performance Spaces/ Events Venues (1)	Orlagh House (indoor/outdoor venue) • Others within 3km: Marley Park (outdoor venue)

4.4 Education Facilities

The study area is home to a range of existing education services, with Edmondstown National school (Primary), St. Colmcille's Senior National School (Primary) and St. Colmcille's Community School (Post-Primary) operating in locations proximate to the proposed development, along with 10 No. other primary and post-primary education facilities. We note that 1 No. special educational facility, Saplings Special School, also provides educational services for children with autism and complex needs in Rathfarmham.

There were no third level institutions identified within the immediate study area (within c. 1.5km), however the Tallaght Campus of Technical University Dublin (TU Dublin - Tallaght) is accessible within c. 5km. A number of training facilities including PARTAS (Bolbrook Enterprise Centre), IICP Education and Training (Killindarden Enterprise Park), and the Irish Lifecoach Institute were also identified in this enlarged study area.



Edmondstown National School



St. Colmcille's Community School

Table 4.4: Education Infrastructure within c. 1.5km	
Type	**Facilities**
Primary (8)	St. Colmcille's Senior National School, S N Bhaile Eamonn (Edmondstown NS), Gaelscoil Chnoc Liamhna, Schol Colmcille Naofa, St Patrick GNS, Scoil Mhuire, Firhouse Educate Together Primary School, Gaelscoil na Giuise
Post-Primary (5)	St. Colmcille's Community School, Rockbrook Park School (Boys), Sancta Maria College (Girls), Colaiste Eanna (Boys), Firhouse Educate Together Secondary School
Special Education (1)	Saplings Special School
Third Level and Training Facilities (3)	St. Mary's Community Employment Project, Ballyboden Adult Social Education Group (BASE), The WEB Project • Others within 5km: TU Dublin – Tallaght, PARTAS (Bolbrook Enterprise Centre), IICP Education and Training (Killindarden Enterprise Park), Irish Lifecoach Institute

4.5 Childcare Facilities

A total of 27 No. operational facilities were identified in the area using the latest Tusla Early Years Inspectorate data[7] which could be accessed from the site within 10-minutes' drive (c. 1.5km radius), along with 3 No. additional services which have recently closed as indicated in Table 4.5. These facilities were reported as having a combined capacity of 764 No. childcare places at the time of the survey (January 2021).

Table 4.5 – Childcare Capacity of Existing Facilities within Study Area		
No.	**Facility Name**	**Maximum Enrolment**
1	Pebbles Playgroup	7 places
2	Wendy's House Montessori	22 places
3	Chuckleberries - Dalriada	75 places
4	Ballycullen Montessori	21 places
5	Chuckleberries - Hunters Walk	90 places
6	The Learning Curve	66 places
7	Let's Play Preschool	22 places
8	The Lodge Montessori School	15 places
9	Little Penguins	12 places
10	Eager Beavers Montessori	12 places
11	The Children's House Montessori School	8 places
12	Twinkle Stars	5 places
13	Chuckleberries - Tree Tops	14 places
14	Knocklyon Lodge & Crèche Montessori	100 places
15	Naionra Chnoc Liamhna	20 places
16	Delaford Montessori	22 places

[7] The Tusla Early Years Inspectorate carries out inspections of Early Years Services under Section 58(J) of the *Child Care Act 1991* (as inserted by Section 92 of the *Child and Family Agency Act 2013*). Inspection Reports for active facilities are available online for public inspection and are updated at regular intervals by the service. Visit the Tusla website for more detail: https://www.tusla.ie/services/preschool-services/creche-inspection-reports/

17	Coolkidz Crèche	14 places
18	Giddy-ups Pre-School	16 places
19	Young Days Montessori	12 places
20	Crescent Hill Preschool	44 places
21	Moyville Montessori	24 places
22	Rays of Sunshine Preschool	6 places
23	Firhouse Montessori	24 places
24	Scoil Mhuire Preschool	12 places
25	Ballyboden Family Centre	12 places
26	Killakee Montessori & Creche	22 places
27	Kids Inc Rathfarnham	67 places
-	Orlagh Park House	*Closed – Summer 2020*
-	Prospect Montessori School	*Closed – Summer 2020*
-	Never Never Land	*Closed – Spring 2020*
	Total	**764 childcare places**

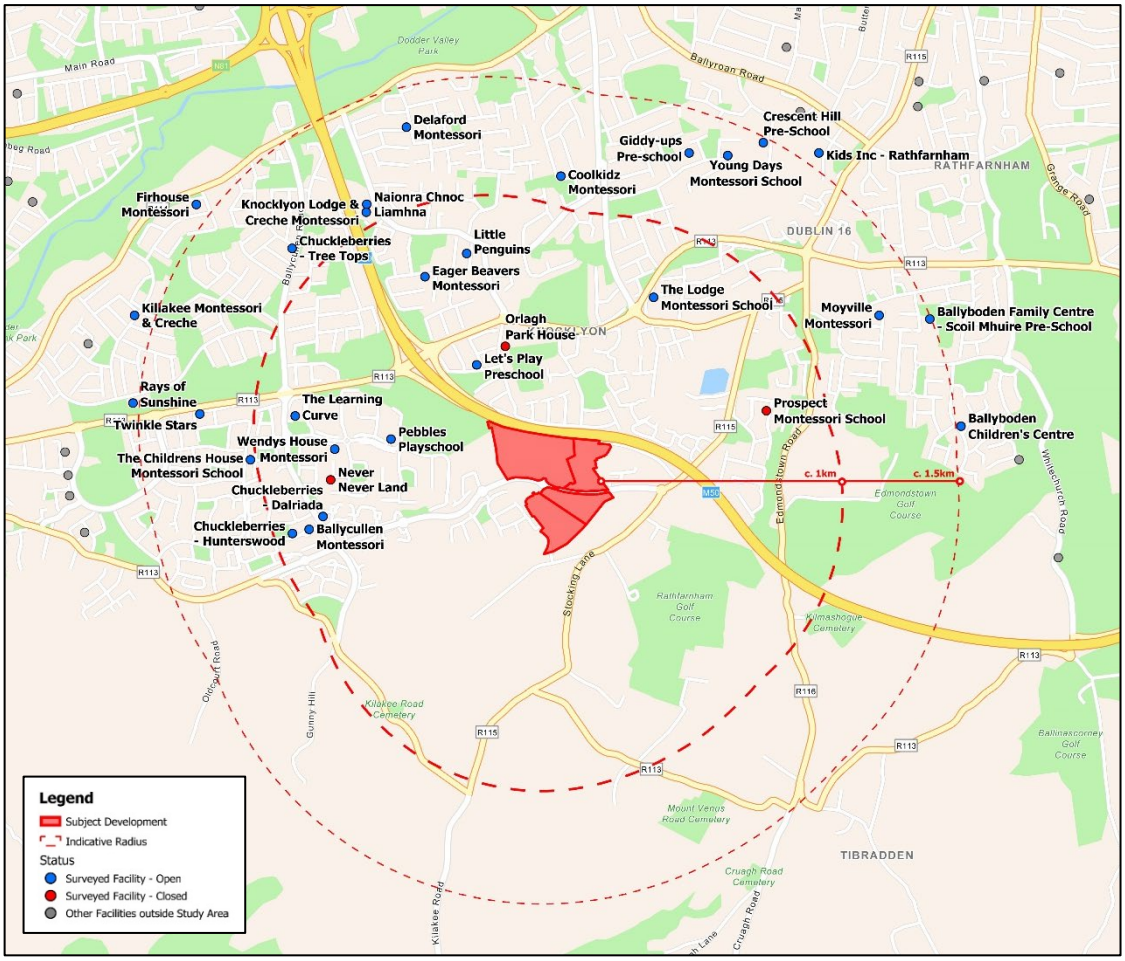


Figure 4.2: Map of operational childcare facilities identified within c. 1.5km radius of subject site, shown in blue. Other facilities which have recently closed are shown in red. Data Source: Pobal Childcare Services, 2021.

4.6 Healthcare Facilities

Though there were no hospital facilities identified within the immediate study area, we note that Tallaght University Hospital and Mount Carmel Community Hospital area accessible within c. 6km of the subject site (i.e., 12-15 minutes' drive). There are a number of existing health centres available to local residents, however, including Woodstown Medical Centre (Primacare)and Ballyboden Medical Practice. These are supported by a range of smaller GP clinics and specialty healthcare facilities such as Bloomfield Health Services (mental health) and the Rutland Centre (addiction services).



Woodstown Medical (Primacare)



Ballyboden Medical Centre

For elderly patients, New Lodge Nursing Home (within Bloomfield Health Services Campus) and Sally Park Nursing Home are also located within the study area and provide private convalescent services for residents with a variety of physical and mental healthcare issues.



Bloomfield Health Services/New Lodge



Sally Park Nursing Home

Table 4.6: Healthcare Infrastructure within 1.5km	
Type	**Facilities**
Hospitals (0)	None identified within the study area • Others within c. 3km: Tallaght University Hospital, Mount Carmel Community Hospital
Health Centres (4)	Woodstown Medical Centre (Primacare), Knocklyon Medical, Ballyboden Medical, Scholarstown Family Practice
Clinics (9)	Dr. Luke Brady (GP), Dr Moira Woolfson (GP), Woodstown Dental Clinic, Smile Savers Dental Knocklyon, Bloomfield Health Services, Rutland Centre, Buffini Conlon Rehabilitation, Sports Physiotherapy & Athletic Rehab, Select Care Physical Therapy
Nursing Homes (2)	New Lodge Nursing Home, Sally Park Nursing Home

4.7 Religious and Burial Facilities

The proposed development has access to a range of established churches and other faith-based institutions within the study area, including the New Apostolic Church and Quaker House within the Bloomfield Health Services complex to the southeast and St. Colmcille's Church within c. 10-minutes' drive to the north. There were also 3 No. burial grounds identified to the west and south of the subject site, including: Woodtown, Mount Venus and Kilmashogue Cemeteries.



St. Colmcille's Church



New Apostolic Church & Quaker House

Table 4.7: Arts, Cultural & Religious Institutions	
Type	**Facilities**
Churches and Multi-faith Centres (9)	New Apostolic Church, Quaker House, Church of Christ, Saint Colmcille's Church, St. Augustine's Church, St. Augustine's Parish Centre, Church of Our Lady of Good Counsel, Our Lady of Mount Carmel, Carmelite Sisters
Burial Grounds (3)	Woodtown Cemetery, Mount Venus Cemetery, Kilmashogue Cemetery

4.8 Sports and Leisure Facilities

With respect to sports and leisure facilities in the area, a total of 12 No. sports centres and clubs were identified, along with 4 No. leisure centres/gyms. The proposed development site has access to St. Enda's GAA Club, Rathfarnham Golf Club, and Rathfarnham Equestrian Centre within c. 5-minutes' drive, and Firhouse Community & Leisure Centre and Curves Knocklyon within c. 10-minutes' drive. Though no swimming pool facilities were identified in the immediate area, we note that the Cheeverstown House Swimming Pool and Tallaght Community School Sports Complex Swimming Pool are accessible within c. 5km of the proposal.



Rathfarnham Golf Course & Club



Firhouse Community & Leisure Centre

Table 4.8: Sport and Leisure Infrastructure within 1.5km	
Type	**Facilities**
Sports Centres/Clubs (12)	Wanderers GAA Club, Firhouse Carmel Football Club, Knocklyon United Football Club, Saint Enda's GAA Club (Ballyboden), St. Enda's GAA Club (Firhouse Road), St. Enda's GAA Club (Sancta Maria), St. Joseph's Amateur Boxing Club, Rathfarnham Golf Course and Club, Edmondstown Golf Course, St. Augustine's Pitch and Putt, The Creek Pitch and Putt, Rathfarnham Equestrian Centre
Leisure Centres/Gyms (4)	Firhouse Community & Leisure Club, Olympian Gymnastics Club, ROD Fitness, Curves Knocklyon
Swimming Pools (0)	None identified within study area • Others within 5km: Cheeverstown House Swimming Pool, Tallaght Community School Sports Complex Swimming Pool

4.9 Open Space and Recreation Facilities

A wide range of parks and local playing pitches and are also available to potential residents, including Knocklyon Park and Woodstown Park immediately adjacent the subject site. Other parks located within c. 10-minutes' drive of the proposed development include the Firhouse Community Centre Playing Pitches, Ballycragh Park and Boden Park to the north. We note that 5 No. children's playgrounds and mixed-use games areas (MUGAs) were also identified, including the Woodstown Park, Abbot's Grove and Dalriada Park playgrounds along Stocking Avenue.



Woodstown Park & Playground



Knocklyon Park & Ballycullen Playing Pitch

Table 4.9: Open Space Recreation Infrastructure within 1.5km	
Type	**Facilities**
Parks and Open Space (9)	Knocklyon Park, Woodstown Park, Delaford Park, Boden Park, Firhouse Village Park, Ballycragh Park, Frank Kelly Park, Woodlawn Park, Glendoher Park
Playing Pitches and Other Grounds (10+)	Firhouse Community Centre Playing Pitches, Scoil Treasa School Playing Pitches, Sancta Maria College Pitches, St. Mary's National School Pitches, Wanderers GAA Club Pitches, Firhouse Carmel Football Club Pitches, Knocklyon United Football Club Pitches (Delaford Park), Saint Enda's GAA Club Pitches, Ballyboden St. Enda's GAA Club – Firhouse Road Pitches, Ballyboden St. Enda's GAA Club – Sancta Maria Pitches
Playgrounds/MUGAs (5)	Abbot's Grove Playground, Dalriada Park Playground, Boden Heath Playground, St. Colmcille's School Playground/MUGA, Woodstown Park Playground

5.0 CONCLUSION

The proposed development site comprises c. 15-hectares of land within the Firhouse/Ballycullen Electoral Division of South Dublin, just outside the M50 motorway. This area was largely comprised of working adults and families with children at the time of the most recent Census (2016) and appeared to be growing at a faster pace (c. 6%) than the rest of the nation (3.8%) from 2006-2016. The demographic profile of the area (i.e., age, economic/social status and education) was largely consistent with the rest of the South Dublin, however, Firhouse/Ballycullen was home to a lower percentage of 'Older Adults' (c. 5% aged 65+) than the rest of the county (11%) and a much higher proportion of the population (50%) had received a 'Third Level' education than elsewhere in South Dublin.

These statistics indicate that a higher proportion of community facilities may be required for the working population and families with school-aged children in this area than other demographic groups. We note, however, that the current population figures do not account for the development capacity of additional zoned land within the study area and potential population growth arising from future developments. With respect to the level of existing service provision in the study area (i.e., within c. 1.5km equivalent to c. 10-minutes' drive time), the facilities identified in the course of the infrastructure audit can be summarized as follows:

- **Community:** The subject site is well served by more than 10 No. existing community and youth centres, including Firhouse Community & Leisure Club and Knocklyon Youth & Community Centre, as well as 2 No. food growing amenities within the study area.

- **Library/Cultural:** Only 1 No. permanent library facility was identified (Whitechuch Library), however, the area is also served by 2 No. mobile library stops at Hunters Avenue and Prospect Drive. While there were no significant arts and cultural facilities located within the immediate study area, the development site does have access to the Rua Red South Dublin Arts Centre, South Dublin Civic Theatre and Pearse Museum within a c. 15-minute drive.

- **Education:** The proposed development is also well served by educational facilities, with 8 No. primary schools and 5 No. post-primary located within c. 1.5km of the subject site. The Tallaght campus of TU Dublin is also accessible within c. 5km and is supported by 3 No. local training facilities, including St. Mary's Community Employment Project and The WEB Project.

- **Childcare:** A total of 27 No. existing childcare facilities were operating within c. 1.5km of the proposed development at the time of the survey, with capacity for more than 750 No. childcare places. We note that a substantial creche (c. 50 places or more) is also proposed within the subject development scheme to support future residents.

- **Healthcare:** There were no hospital facilities identified within the study area, however Tallaght University Hospital is accessible within c. 12-15 minutes' drive. There are also 4 No. health centres and 9 No. specialty clinics to service the proposed development and 2 No. existing nursing homes including New Lodge Nursing Home and Sally Park Nursing Home.

- **Religious:** A range of 9 No. established churches and faith-based institutions are available to local residents, including New Apostolic Church and Quaker House immediately south of the subject site within the Bloomfield Health Services campus, along with 3 No. cemeteries.

- **Sports/Leisure**: A total of 12 No. sports centres and clubs were identified in the study area, including St. Enda's GAA Club and Rathfarnham Golf Club within c. 5-minutes' drive, along with 4 No. leisure centres/gyms. The nearest swimming pool facility is located c. 5km away in Cheeverstown House.

- **Open Space/Recreation:** A wide range of parks and playing pitches (more than 20 No. identified) are available to serve the proposed development, including Knocklyon Park and Woodstown Park immediately adjacent the subject site. We note that 5 No. children's playgrounds and MUGAs were also identified within c. 10-minutes' drive.

On the basis of this audit, the Stocking Avenue development site is well served by existing education, childcare, community, religious and sports/recreation facilities. However, higher order healthcare facilities such as hospitals and largescale medical centres are limited within the immediate study area (c. 10-minutes' drive) and more significant arts and cultural facilities may be required to serve the local population.

We note that the proposed scheme includes a range of residential support services as well as a number of public amenities including 2 No. community facilities, a substantial 591 sq. m crèche and various public open spaces including children's play areas and informal playing pitches which will positively contribute to the amenity of the Firhouse/Ballycullen area once the development is completed.

APPENDIX 2 - CHILDCARE FACILITY AUDIT

CHILDCARE DEMAND ASSESSMENT – STOCKING AVENUE

FOR ASSESSMENT OF PROPOSED COMBINED RESIDENTIAL DEVELOPMENT ON LANDS KNOWN AS 'WHITE PINES NORTH, SOUTH, EAST AND CENTRAL' ALL LOCATED AT STOCKING AVENUE, BALLYCULLEN, DUBLIN 16



PREPARED FOR:

ARDSTONE HOMES
48 Fitzwillam Square
Dublin 2
D02 EF89

PREPARED BY:

TOM PHILLIPS + ASSOCIATES
80 Harcourt Street
Dublin 2
D02 F449

IN ASSOCIATION WITH:

VIRTUS PROJECT MANAGMENT
5th Floor
The Glass House
11 Coke Lane
Dublin 7
D07 WNP2

ISSUE DATE: JANUARY 2021

1.0 EXECUTIVE SUMMARY

Ardstone Homes[1] have requested that a childcare capacity audit be undertaken for the assessment of 4 No. distinct residential developments known as 'White Pines North, South, East and Central' all located at Stocking Avenue, Ballycullen, Dublin 16. The combined development is expected to comprise a maximum of 659 No. units, including 151 No. 1-bedroom units, 198 No. 2-bedroom units, 151 No. 3-bedroom units, 132 No. 4-bedroom units and 27 No. 5-bedroom units along with all associated car parking, landscaping and service works once completed, as indicated in Table 1.1.



Figure 1.1: Indicative Site Location Plan, prepared by TPA, 2021.

Table 1.1: Proposed Schedule of Accommodation – Combined Developments

Unit Type	*North*	*South*	*East*[2]	*Central*	*Combined*	*% of Total*
1-bed units	-	-	93	58	**151**	**23%**
2-bed units	-	-	148	50	**198**	**30%**
3-bed units	81	41	-	29	**151**	**23%**
4-bed units	84	48	-	-	**132**	**20%**
5-bed units	10	17	-	-	**27**	**4%**
Total Units	**175**	**106**	**241**	**137**	**659**	**100%**

The Applicant has requested that a childcare capacity audit be undertaken for the surrounding area to determine the existing level of childcare services provision and potential requirement for additional facilities to service these developments. A comprehensive audit was undertaken by TPA in January 2021, the results of which have been summarised as follows:

[1] Ardstone Homes, 48 Fitzwilliam Square, Dublin 2, D02 EF89.
[2] Subject Application.

- Of the 659 No. units proposed within the combined development, only the 508 No. units of 2-bedrooms or more can reasonably accommodate families with respect to the *Apartment Guidelines, 2018,* generating a requirement for 135 No. childcare spaces.[3]

- It is estimated that approximately 193 No. pre-school children will occupy the development once completed; however, childcare uptake for a new facility in this area is likely to be only c. 48-89 No. children with respect to recent demographic trends.

- The subject site is located in an emerging residential area which is served by a total of 27 No. operational childcare facilities within a c. 1.5km radius (c. 10-minute drive time) that currently provide more than 760 No. childcare places to local residents.

- A childcare audit was undertaken by Tom Phillips + Associates (TPA) using email and telephone survey methods in January 2021, which identified 52 No. places were available for new enrolments (c. 7% capacity) within the existing childcare network.

    - We note that 3 No. new childcare facilities have recently been permitted or are proposed to be developed within c. 1km of the subject site in nearby SHD Applications, which would positively contribute to the childcare network once completed.

As the proposed development comprises 508 No. dwelling units which can reasonably accommodate families (i.e., 2-bedrooms or more with respect to the relevant guidance), we submit that a new purpose-built childcare facility is required at this location with provision for 135 No. childcare places to service the entire scheme (i.e., the 659 No. units comprising 'White Pines North, South, East and Central').

However, the c. 591 sq. m childcare facility permitted under Ref. SD19A/0345 (as amended by Ref. SD20A/0322) forms part of the overall residential scheme and is currently under construction. As this facility has sufficient capacity to absorb the demand of the entire scheme (i.e., 50 spaces or more), an additional childcare facility is not proposed to be provided as part of the current application for 'White Pines East'.

2.0 RELEVANT PLANNING GUIDANCE

2.1 National Planning Guidance for the Provision of Childcare Facilities

The *Childcare Facilities: Guidelines for Planning Authorities, 2001 (Childcare Guidelines, 2001)* produced by the Department of Housing, Planning and Local Government (DoHPLG) state the following with respect to the provision of new housing developments:

> *"Planning authorities should require the provision of at least one childcare facility for new housing areas unless there are significant reasons to the contrary for example, development consisting of single bed apartments or where there are adequate childcare facilities in adjoining developments.* ***For new housing areas, an average of one childcare facility for each 75 dwellings would be appropriate****…*

[3] (508 No. units / 75 No. units) x 20 spaces = 135 No. places required

> ***The threshold for provision should be established having regard to the existing geographical distribution of childcare facilities and the emerging demographic profile of areas."***
>
> *[**Our emphasis,** Section 2.4, p. 5]*

The *South Dublin County Development Plan 2016-2022* states that *Section 3.10.0* of *Chapter 3 Community Infrastructure* and *Section 11.3.11* of *Chapter 11 - Implementation* address the issue of Early Childhood Care and Education and the assessment of same. The formulation of the *Plan* had regard to the recommendations and requirements of the *Childcare Facilities: Guidelines for Planning Authorities (2001).*

2.1.1 Sustainable Urban Housing Guidelines - Apartments

The *Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities, 2018 (Apartment Guidelines, 2018)* also includes specific guidance with respect to childcare provision in the design and development of apartment schemes, as follows:

> *"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."*
>
> *[**Our emphasis,** Section 4.7.]*

In respect of these requirements, the composition of the subject development proposal, geographic distribution of existing childcare facilities and the demographic profile of the Ballycullen area are assessed in Sections 3.0 to 5.0 to follow.

2.2 Development Plan Requirements

The *South Dublin County Development Plan 2016-2022* (SDP) states that for consolidation areas within the gateway, including Firhouse/Ballycullen (where there is no set population target required by the Regional Planning Guidelines) that there are existing childcare facilities throughout the area and no new facilities are explicitly required (p. 50). The SDP also states:

> *"**Pre-school childcare needs are difficult to assess on a long-term basis as the nature of demand evolves over time** based on factors such as the population profile of an area, market conditions, government policy and the level of state intervention.*
>
> *Notwithstanding this, there is a recognised need for planned provision in new communities where no infrastructure exists.* ***South Dublin County Council will seek to***

facilitate the provision of good quality and accessible childcare infrastructure at appropriate locations by combining area-based requirements in new communities with market-led provision in more established areas."

*[**Our emphasis,** Section 3.10.0, p. 57]*

The SDP supports the co-location childcare infrastructure within town, village, district and local centres, within or adjacent to school sites and in employment areas, as well as in community buildings such as community centres. Specific policies and objectives for the development of childcare facilities are included in Community Infrastructure (C) Policy 8 and Policy 9 - Objective 7 which are reproduced in Table 2.1 and 2.2:

Table 2.1: COMMUNITY INFRASTRUCTURE (C) Policy 8 – Childcare Facilities	
Policy C8	*(a) It is the policy of the Council to support and facilitate the provision of good quality and accessible childcare facilities at suitable locations in the County.* *(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 1	*To support and facilitate the provision of childcare infrastructure at suitable locations such as town, village, district and local centres, adjacent to school sites and in employment areas.*
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.*
C8 Objective 3	*To support the provision of small-scale childcare facilities in residential areas subject to appropriate safeguards to protect the amenities of the area, having regard to noise pollution and traffic management.*
C8 Objective 4	*To support the provision of childcare facilities in community buildings, such as community centres and schools.*

Table 2.2: COMMUNITY INFRASTRUCTURE (C) Policy 9 – Primary & Post-primary Facilities	
C9 Objective 7	*To promote and support schemes that facilitate the shared use of sufficient school facilities, particularly at planning stage, such as sports halls, ball courts and all-weather pitches for community use outside of school hours and support the co-location of pre and after-school childcare facilities on new primary school developments.*

2.2.1 Assessment of Childcare Facilities

With respect to the provision of new facilities within South Dublin, the SDP also states that childcare facilities should be:

"…purpose built, at ground floor level or as a standalone building. In residential areas the conversion of detached and semi-detached dwellings will be considered at appropriate locations, subject to the protection of residential amenity."

[Section 11.3.11, p.212]

In the assessment of proposals for childcare and education facilities, the SDP establishes that the following criteria will be considered by the Planning Authority:

- *Suitability of the site for the type and size of facility proposed;*
- *Availability of indoor and outdoor play space;*
- *Local traffic conditions;*
- *Access, car parking and drop off facilities for staff and customers;*
- *Nature of the facility (full day care, sessional, after school, etc);*
- *Number of children to be catered for;*
- *Intended hours of operation; and*
- *Impact on residential amenity.*

[Section 11.3.11, p.212]

These criteria are addressed with respect to the proposed development in Sections 3.0 and 5.0 to follow, which provide information with respect to demographic profile of the area and the capacity of existing childcare facilities for new enrolments within a c. 1.5km radius.

3.0 DEMAND GENERATED BY PROPOSED DEVELOPMENTS

The total combined residential development (existing and proposed) comprises 659 No. units, including 151 No. 1-bedroom units, 198 No. 2-bedroom units, 151 No. 3-bedroom units, 132 No. 4-bedroom units and 27 No. 5-bedroom units along with all associated car parking, landscaping and service works once completed, as indicated in Table 3.1. The *Childcare Guidelines 2001,* stipulate that planning authorities should require one childcare facility (providing a minimum 20 No. childcare places) per 75 No. dwellings.

On this basis, the proposed development of 659 No. units would be required to provide a childcare facility for approximately 176 No. childcare spaces[4]. However, of the unit types proposed, only the 508 No. units of 2-bedrooms or more can reasonably accommodate families with respect to the *Apartment Guidelines, 2018,* generating a requirement for 135 No. childcare spaces.[5]

Table 3.1: Proposed Schedule of Accommodation – Combined Developments

Unit Type	*North*	*South*	*East*[6]	*Central*	*Combined*	*% of Total*
1-bed units	-	-	93	58	**151**	**23%**
2-bed units	-	-	148	50	**198**	**30%**
3-bed units	81	41	-	29	**151**	**23%**
4-bed units	84	48	-	-	**132**	**20%**
5-bed units	10	17	-	-	**27**	**4%**
Total Units	**175**	**106**	**241**	**137**	**659**	**100%**

[4] (659 No. units / 75 No. units) x 20 spaces = 176 places required
[5] (508 No. units / 75 No. units) x 20 spaces = 135 places required
[6] Subject Application.

4.0 DEMOGRAPHIC PROFILE

The most recent Irish Census (2016) identified that the pre-school population of South Dublin declined by nearly 6% from 2011 to 2016, and currently forms c. 8% of the overall population. We note that the primary and secondary school cohorts each grew by c. 10% in the recent period, which indicates a slightly older family cohort within the county. The elderly population (65+ years) demonstrated the largest increase overall, with c. 34% growth from 2011 to 2016.

Table 4.1: South Dublin Population – Changing Age Profile (CSO)			
Age Group	**2011 Population**	**2016 Population**	**% Change**
Pre-school (0-4 years)	23,043	21,733	6% decrease
Primary School (5-12 years)	31,260	34,665	11% increase
Secondary School (13-18 years)	20,215	22,270	10% increase
Young Adults (19-24 years)	21,542	19,567	9% decrease
Adults (25-64 years)	146,092	149,607	2% increase
Older People (65+ years)	23,053	30,925	34% increase
Total	**265,205**	**278,767**	**5% increase**

4.1 Demand Implications of Local Demographics

The average household size recorded by the 2016 Census was 2.75 No. persons per unit[7], which generates an indicative population of 1,812 No. persons within the development once fully occupied, including 1,387 No. persons within the 508 No. units (2-bedrooms or more) proposed which can reasonably accommodate families.

The average number of children per family recorded in the State in census 2016 was 1.38 children, which generates an indicative population of 701 No. children (between the ages of 0-18 years) within the proposed development. Of this number, an estimated 193 No. children would be considered pre-school age (between the ages of 0-4 years) with respect to the age cohorts recorded for South Dublin[8] in 2016.

Table 4.2: South Dublin Population, 0-18 Year Age Cohort (CSO 2016)		
Age Group	**2016 Population**	**% of Total Cohort**
Pre-school children (0-4 years)	21,733 persons	27.6%
Primary school children (5-12 years)	34,665 persons	44.1%
Secondary school children (13-18 years)	22,270 persons	28.3%
All children (0-18 years)	**78,668 persons**	**100%**

The proposed development contains 508 No. units of a size appropriate to accommodate families and based on the above calculations, has the potential to generate an additional 193 No. pre-school children within the area.

[7] https://www.cso.ie/en/releasesandpublications/ep/p-cp4hf/cp4hf/hhlds/
[8] https://www.cso.ie/en/releasesandpublications/ep/p-cp3oy/cp3/agr/

If the average rate of non-parental childcare uptake for this age group in the Dublin area is applied (46%)[9], it is estimated that 89 No. children from the subject development would be likely to avail of childcare in the area.

If the average rate of uptake for crèche, Montessori, playgroup and after-school services is applied (25%)[10], it is estimated that 48 No. children from the subject development would be likely to avail of childcare in the area from this population.

5.0 CHILDCARE NEEDS ANALYSIS

The latest *Early Years Sector Profile Report 2018/2019* (published by Pobal in December 2019[11]) also identified a c. 5% vacancy rate within Dublin-South Dublin, equivalent to 424 No. vacant childcare places across the county.[12] The number of services in South Dublin increased by 4% (i.e. 9 No. new services) in 2018/2019 from the previous year, with a total of 255 No. facilities in operation (215 No. private facilities and 40 No. community facilities)[13] which catered to an average enrolment of 49 No. children per facility.

Table 5.1 – Capacity Summary of South Dublin Childcare Services (EYSP 2016/17 - 2018/19)

County (Year)	Enrolled	Vacant places	Vacancy rate	Waiting List
SDC (2016/17)	8,528	476	6%	1,028
SDC (2017/18)	9,294	373	4%	639
SDC (2018/19)	9,318	424	5%	1,014

Table 5.2 – Services Summary of DLRC Childcare Services (EYSP 2016/17 - 2018/19)

County (Year)	Population	Summary Statistics		
	Enrolled	Total No. of Services	No. of services with (>=1) child enrolled	Average enrolled per facility
SDC (2016/17)	8,528	238	197	43
SDC (2017/18)	9,294	246	208	45
SDC (2018/19)	9,318	255	193	49

The South Dublin County Childcare Committee (SDC Childcare) was also consulted in the course of this assessment, but could not provide any localised capacity data for Ballycullen. However, the SDC Childcare officer advised anecdotally that there may be a shortage of places for the '0-1 years' age group in this area.[14] As no local statistics could be provided by SDC Childcare, an independent capacity audit was undertaken by TPA to ascertain more recent vacancy levels. See Section 5.1 for details.

[9] CSO *Quarterly National Household Survey Childcare* - Quarter 3 2016: https://www.cso.ie/en/releasesandpublications/er/q-chi/qnhschildcarequarter32016/
[10] Refer to Footnote No. 4 above.
[11] The Early Years Sector Profile Report 2019/2020 was not yet available in January 2021.
[12] *Early Years Sector Profile Report 2018/2019*, Table 5.14, p. 90.
[13] *Early Years Sector Profile Report 2018/2019*, Figure 3.3, p. 50.
[14] By email with SDC Childcare Development Officer on January 2020.

5.1 *Summary of Local Childcare Capacity Audit*

In order to determine the current levels of childcare provision in the Ballycullen study area, an independent childcare capacity audit of existing facilities was conducted by TPA in January 2021 for a study area comprising a c. 1.5km radius from the subject site (see Figure 5.1). A total of 27 No. operational facilities were identified in the area using the latest Tusla Early Years Inspectorate data[15] which could be accessed from the site within a 10-minute drive time (c. 1.5km radius) as indicated in Table 5.3 overleaf.

Where the inspection reports on record were more than 2 years old (i.e., published before 2019), an e-mail/telephone survey was undertaken by TPA in an effort to determine current enrolment figures. However, as some of the operators could not be reached for updated enrolment figures due to the national COVID-19 restrictions[16] in place in January 2021, further survey work to verify capacity figures may be required. The final survey figures used to estimate local capacity are summarised in Table 5.3. We note that where current capacity could not be determined, the most recent Tusla Inspection figures were used. Full details of the audit methodology are included in Appendix A for reference.

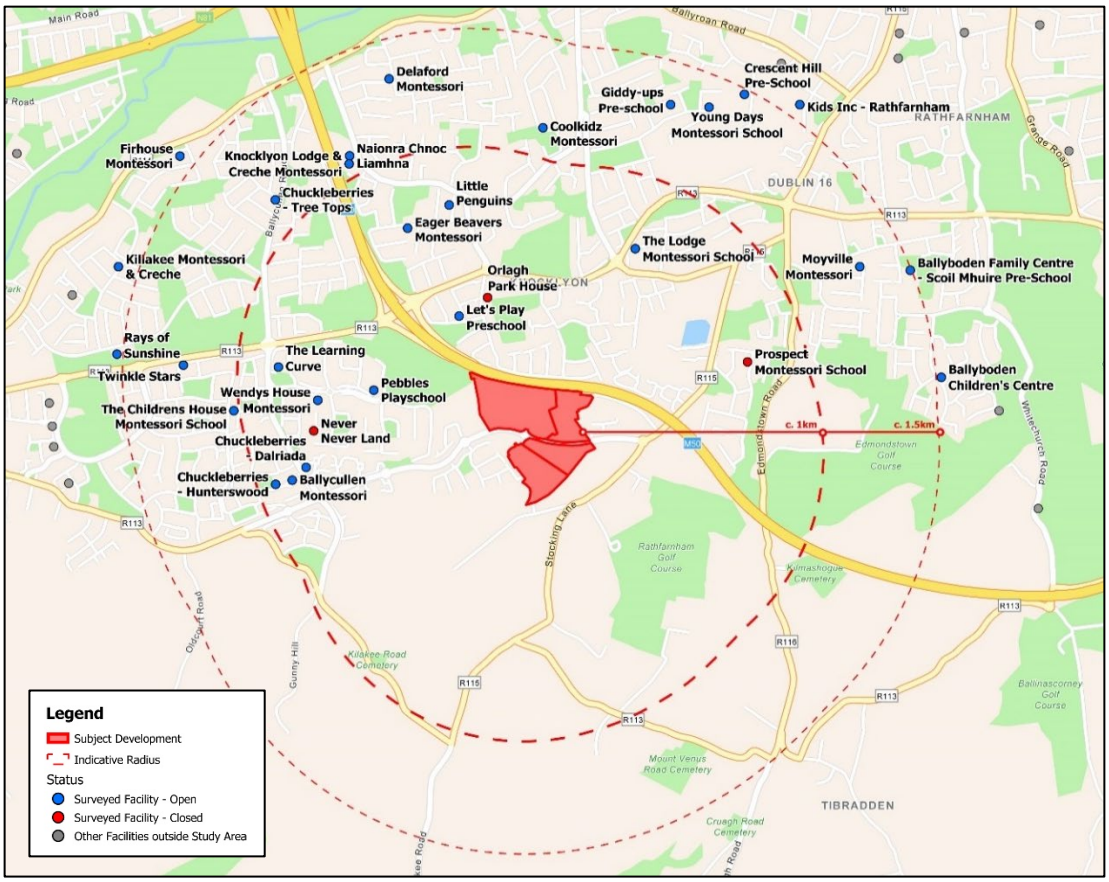


Figure 5.1: Map of operational childcare facilities identified within c. 1.5km radius of subject site, shown in blue. Other facilities which have recently closed are shown in red. Data source: Pobal Childcare Services, 2021.

[15] The Tusla Early Years Inspectorate carries out inspections of Early Years Services under Section 58(J) of the *Child Care Act 1991* (as inserted by Section 92 of the *Child and Family Agency Act 2013*). Inspection Reports for active facilities are available online for public inspection and are updated at regular intervals by the service. Visit the Tusla website for more detail: https://www.tusla.ie/services/preschool-services/creche-inspection-reports/

[16] This survey was conducted during the period of the nationwide COVID-19 restrictions in Ireland, when a wide range of businesses, including schools and childcare facilities, were closed to the public.

The combined capacity figures provided by Tusla and the audited facilities suggest that 764 No. childcare places are currently being provided in the study area and that 52 No. places are potentially available for new enrolments (c. 7% of total places reported). We note that a number of the facilities were identified as having some capacity for additional enrolments and that 5 No. of the facilities in the area were currently catering for more than 65 No. children (i.e., Chuckleberries – Dalriada, Chuckleberries – Hunters Walk, The Learning Curve, Knocklyon Lodge & Crèche Montessori and Kids Inc Rathfarnham).

Table 5.3 – Childcare Capacity of Existing Facilities within Study Area

No.	Facility Name	Enrolment	Max. Capacity	Est. Capacity
1	Pebbles Playgroup	7	7	Waitlist
2	Wendy's House Montessori	18	22	4
3	Chuckleberries - Dalriada	75	75	Waitlist
4	Ballycullen Montessori	21	21	Waitlist
5	Chuckleberries - Hunters Walk	90	90	Waitlist
6	The Learning Curve	66	66	Waitlist
7	Let's Play Preschool	19	22	3
8	The Lodge Montessori School	15	15	Waitlist
9	Little Penguins	12	12	Waitlist
10	Eager Beavers Montessori	9	12	3
11	The Children's House Montessori School	8	8	Waitlist
12	Twinkle Stars	3	5	2
13	Chuckleberries - Tree Tops	14	14	Waitlist
14	Knocklyon Lodge & Crèche Montessori	100	100	Waitlist
15	Naionra Chnoc Liamhna	20	20	Waitlist
16	Delaford Montessori	21	22	1
17	Coolkidz Crèche	13	14	1
18	Giddy-ups Pre-School	11	16	5
19	Young Days Montessori	10	12	2
20	Crescent Hill Preschool	38	44	6
21	Moyville Montessori	23	24	1
22	Rays of Sunshine Preschool	5	6	1
23	Firhouse Montessori	22	24	2
24	Scoil Mhuire Preschool	12	12	0
25	Ballyboden Family Centre	12	12	0
26	Killakee Montessori & Creche	15	22	7
27	Kids Inc Rathfarnham	53	67	14
-	Orlagh Park House	*Permanently closed – Summer 2020*		
-	Prospect Montessori School	*Permanently closed – Summer 2020*		
-	Never Never Land	*Permanently closed – Spring 2020*		
	Totals	**712**	**764**	**52**

5.2 *Planning Applications for Additional Facilities*

With respect to permitted Planning Applications for additional childcare facilities within the subject area, we note that 3 No. of the extant permissions identified in Table 5.4 relate to facilities which were operational at the time of the childcare survey (January 2021).

An additional 2 No. childcare facilities have recently been permitted in the area through Strategic Housing Development (SHD) applications at Scholarstown Road and Taylor's Lane, which will contribute positively to the childcare provision of the area once completed. One other childcare facility is currently under consideration by the Board as part of the SHD application at Stocking Lane (Ref. 308763 – unrelated to subject application); however, a decision has not yet been reached on this scheme.

Table 5.4: Childcare Facilities Permitted or Proposed in the Vicinity of Subject Development

Reg. Ref.	Description	Status
ABP 308763	**Stocking Lane, Ballyboden, Dublin 16 (SHD)** 131 residential units incl. a creche of c. 128 sq. m within Block L.	Undecided
ABP 305878	**'Beechpark' and 'Maryfield', Scholarstown Road, Dublin 16 (SHD)** 590 residential units (480 Build-to-Rent apartment units and 110 Build-to-Sell duplex units and apartments), ancillary residential support facilities and commercial floorspace. Incl. a creche (438 sq. m) within Block C2 at ground floor level.	Grant
ABP 307222	**Site at Taylors Lane and Edmondstown Road, Taylors Lane, Ballyboden, Dublin 16 (SHD)** 496 residential units within 3 apartment/duplex blocks (over basement car parks) ranging in height from 2-7 storeys. Incl. a creche (655 sq. m) within Block A.	Grant
SD19A/0269	**The Millennium Building, Firhouse Community & Leisure Club Ltd, Ballycullen Drive, Firhouse, Dublin 24 (Rays of Sunshine Preschool)** Retention of change of use of youth club facility at ground floor level to a shared pre-school and after-school facility together with multi-purpose rooms for community use, complete with toilet and storage facilities (205 sq. m).	Grant
SD19A/0066	**1, Templeroan Lodge, Knocklyon, Dublin 16 (The Lodge Montessori)** Operating a second preschool session from 1pm to 4pm, Monday to Friday, enrolling up to 11 children.	Grant
SD19A/0046	**5, Orlagh Way, Knocklyon, Dublin 16 (Let's Play Preschool)** Change of use of 49 sq. m of dwelling to a pre-school sessional service area for 22 children per session, for two sessions daily.	Grant

Within the proposed development scheme, we note that the c. 591 sq. m childcare facility permitted under Ref. SD19A/0345 (as amended by Ref. SD20A/0322) is currently under construction and has sufficient capacity (i.e., 50 spaces or more) to absorb the demand of the entire scheme. Therefore, an additional childcare facility is not proposed to be provided as part of the current 'White Pines East' application.

Table 5.5: Childcare Facilities Permitted/Under Consideration within Subject Development		
Reg. Ref.	**Description**	**Status**
SD20A/0322	**Lands south of Stocking Avenue, Woodtown, Dublin 16** Amendments to the single storey convenience retail unit (c. 1,479 sq.m GFA) and to the creche which was permitted under Reg. SD19A/0345. Note: This application will provide for a replacement crèche of c. 591 sq. m to service the entire White Pines North, South and East development.	Grant Under Construction
SD19A/0345	**Lands south of Stocking Avenue, Woodtown, Dublin 16** Construction of a neighbourhood centre comprising: a single storey convenience retail unit (c. 1,479 sq. m GFA); a mixed use three storey building (c. 577 sq. m GFA) comprising a crèche at ground and first floor levels (c. 385 sq. m GFA) and a Community Facility at second floor level (c. 192 sq. m GFA) and all associated works.	Grant Under Construction

6.0 CONCLUSION

The national planning guidance and local development plan guidance in relation to childcare provision states that the planning authority should require at least one childcare facility per every 75 No. dwellings unless there are significant reasons to the contrary. As the proposed development comprises 508 No. dwelling units which can reasonably accommodate families (i.e., 2-bedrooms or more with respect to the relevant guidance), we submit that a new purpose-built childcare facility is required at this location with provision for 135 No. childcare places to service the overall development scheme (i.e., 'White Pines North, South, East and Central').

However, the total number of childcare places to be accommodated by this facility could potentially be reduced subject to the agreement of the Planning Authority, with respect to the "*existing geographical distribution of childcare facilities and the emerging demographic profile of areas*"[17] evidenced by the childcare audit as follows:

- The subject site is located in an emerging residential area which is served by a total of 27 No. operational childcare facilities within a c. 1.5km radius (c. 10-minute drive time) that currently provide more than 760 No. childcare places to local residents.

- A number of the facilities identified appear to have some capacity for new enrolments, with 52 No. places reported vacant at the time of the audit (c. 7% of total capacity). A total of 5 No. of the facilities in the area were also catering for 65 No. children or more at the time, which is notably higher than the county average of 49 No. children per facility.

- It is estimated that approximately 193 No. pre-school children will occupy the development once completed; however, childcare uptake for a new facility in this area is likely to be only 48-89 No. children with respect to recent demographic trends.

[17] DoHPLG, *'Childcare Facilities: Guidelines for Planning Authorities' (2001)', Section 2.4, p. 5*

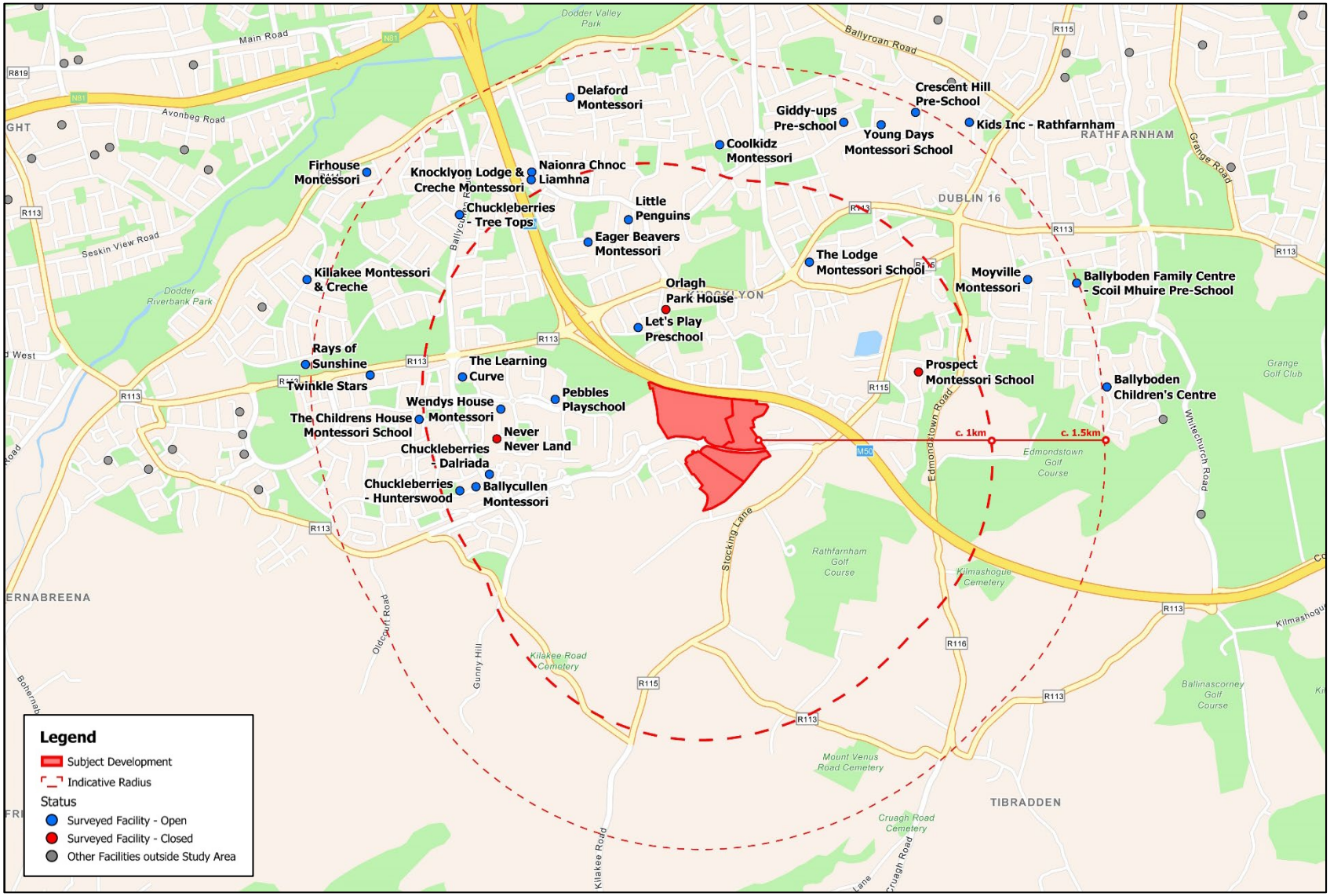
While the maximum number of childcare places that will be required to serve the subject development with respect to the current proposal is 135 No. places, the demographic analysis suggests that only c. 48-89 No. places are likely to be utilised at this location.

It is our opinion that the demand for childcare generated by the proposed development could be partially absorbed by the existing network (27 No. operational facilities providing more than 760 No. places). An additional 3 No. childcare facilities have recently been permitted or proposed within c. 1km of the subject site in nearby SHD Applications, which would positively contribute to the childcare network once completed.

Furthermore, the c. 591 sq. m childcare facility permitted under Ref. SD19A/0345 (amended by Ref. SD20A/0322) forms part of the overall residential scheme and is currently under construction. As this facility has sufficient capacity (i.e., 50 spaces or more) to absorb the demand of the entire scheme, an additional childcare facility is not proposed to be provided as part of the current application for 'White Pines East'.

Appendix A: Independent Childcare Capacity Audit Conducted by TPA Facilities Record, January 2021

Figure A: Map of operational childcare facilities identified within c. 1.5km radius of subject site, shown in blue. Facilities which have recently closed are identified in red.



Summary of Childcare Facilities Audit Located within Study Area								
No.	**Facility Name** **TUSLA Reference**	**Contact Date**	**TUSLA Inspection Reports**		**TPA Facilities Audit**	**Final Audit Values**		
			Attendance	**Maximum**	**Self-reported Capacity**	**Current Enrolment[18]**	**Maximum Enrolment**	**Current Capacity[19]**
1	**Pebbles Playgroup** Ref. TU2015DS230	EYI - 04.02.2020 TP - 01.2021	AM - 6	AM - 7	Waitlist in place	7	7	0
2	**Wendy's House Montessori** Ref. TU2015DS172	EYI - 26.02.2018 TP - 01.2021	AM - 18	22	No response	18	22	4
3	**Chuckleberries – Dalriada** Ref. TU2015DS012	EYI - 22.01.2020 TP - 01.2021	AM - 59 PM - 58	75	Waitlist in place	75	75	0
4	**Ballycullen Montessori** Ref. TU2015DS039	EYI - 16.01.2018 TP - 01.2021	AM - 21	NA	Waitlist in place	21	21	0
5	**Chuckleberries - Hunters Walk** Ref. TU2015DS007	EYI - 04.05.2018 TP - 01.2021	AM - 55 PM - 32	90	Waitlist in place	90	90	0
6	**The Learning Curve** Ref. TU2015DS108	EYI - 22.02.2018 TP - 01.2021	AM - 55	AM - 66	Waitlist in place	66	66	0
7	**Let's Play Preschool** Ref. TU2016DS011	EYI - 13.05.2019 TP - 01.2021	AM -19	19	No response	19	22	3
8	**The Lodge Montessori School** Ref. TU2015DS023	EYI - 06.11.2019 TP - 01.2021	AM – 15 PM – 5	15	No response	14	15	1

[18] Where current enrolment figures were not provided by the individual facilities during the TPA Audit (January 2021), the attendance figures recorded during the most recent TUSLA Inspection were used.
[19] Current capacity was calculated using the survey enrolment figure against the maximum enrolment figure recorded during the most recent TUSLA Inspection.

9	**Little Penguins** Ref. TU2015DS121	EYI - 20.02.2018 TP - 01.2021	AM - 11	12	Waitlist in place	12	12	0
10	**Eager Beavers Montessori** Ref. TU2015DS100	EYI - 07.10.2020 TP - 01.2021	AM – 9	12	No response	9	12	3
11	**The Childrens House Montessori School** Ref. TU2015DS030	EYI - 05.10.2020 TP - 01.2021	8	8	Waitlist in place	8	8	0
12	**Twinkle Stars** Ref. TU2016DS042	EYI - 16.09.2020 TP - 01.2021	3	5	No response	3	5	2
13	**Chuckleberries - Tree Tops** Ref. TU2016DS005	EYI - 20.09.2019 TP - 01.2021	14	-	Waitlist in place	14	14	0
14	**Knocklyon Lodge & Crèche Montessori** Ref. TU2015DS048	EYI - 11.04.2018 TP - 01.2021	AM - 87 PM - 61	100	Waitlist in place	100	100	0
15	**Naionra Chnoc Liamhna** Ref. TU2015DS070	EYI - 14.03.2018 TP - 01.2021	AM - 15	20	Waitlist in place	20	20	0
16	**Delaford Montessori** Ref. TU2015DS166	EYI - 10.04.2018 TP - 01.2021	AM – 20 PM – 17	22	1 place available	21	22	1
17	**Coolkidz Crèche** Ref. TU2015DS158	EYI - 12.03.2018 TP - 01.2021	AM - 13	14	1 place available	13	14	1
18	**Giddy-ups Pre-School** Ref. TU2015DS022	EYI - 17.12.2019 TP - 01.2021	AM – 11 PM – 10	16	No response	11	16	5

19	**Young Days Montessori** Ref. TU2015DS151	EYI - 15.01.2020 TP - 01.2021	AM – 10	12	No response	10	12	2
20	**Crescent Hill Preschool** Ref. TU2015DS097	EYI - 16.04.2018 TP - 01.2021	AM – 38 PM – 10	44	No response	38	44	6
21	**Moyville Montessori** Ref. TU2015DS073	EYI - 05.02.2018 TP - 01.2021	AM – 23	24	No response	23	24	1
22	**Rays of Sunshine Preschool** Ref. TU2018DS504	EYI - 21.01.2020 TP - 01.2021	AM – 5 PM – 5	6	No response	5	6	1
23	**Firhouse Montessori School** Ref. TU2015DS109	EYI - 08.05.2019 TP - 01.2021	AM – 22	24	No response	22	24	2
24	**Ballyboden Children's Centre - Scoil Mhuire Preschool** Ref. TU2016DS002	EYI - 18.09.2019 TP - 01.2021	AM – 12 PM – 7	12	Waitlist in place	12	12	0
25	**Ballyboden Family Centre** Ref. TU2015DS009	EYI - 11.12.2018 TP - 01.2021	AM – 11 PM – 6	12	Waitlist in place	12	12	0
26	**Killakee Montessori & Creche** Ref. TU2015DS091	EYI - 14.02.2018 TP - 01.2021	AM – 15	22	No response	15	22	7
27	**Kids Inc Rathfarnham** Ref. TU2015DS119	EYI - 14.05.2018 TP - 01.2021	AM – 53 PM – 42	67	No response	53	67	14
-	**Orlagh Park House** Ref. TU2015DS159	EYI - 21.11.2018 TP - 20.01.2020	AM - 32 PM - 30	40	Closed Permanently – Summer 2020	0	0	0

-	**Prospect Montessori School** Ref. TU2015DS090	EYI - 13.02.2018 TP – 17.01.2020	13	-	Closed Permanently – Summer 2020		0	0	0
-	**Never Never Land** Ref. TU2015DS229	EYI - 27.03.2018 TP - 16.01.2020	AM - 10 PM - 10	15	Closed Permanently – Spring 2020		0	0	0
		Totals	-	-	-	-	**712**	**764**	**52**

APPENDIX 3 - SCHOOL NEEDS ASSESSMENT

SCHOOLS DEMAND ASSESSMENT – STOCKING AVENUE

FOR ASSESSMENT OF PROPOSED COMBINED RESIDENTIAL DEVELOPMENT ON LANDS KNOWN AS 'WHITE PINES NORTH, SOUTH, EAST AND CENTRAL' ALL LOCATED AT STOCKING AVENUE, BALLYCULLEN, DUBLIN 16



PREPARED FOR:

ARDSTONE HOMES LIMITED
48 Fitzwilliam Square
Dublin 2
D02 EF89

PREPARED BY:

TOM PHILLIPS + ASSOCIATES
80 Harcourt Street
Dublin 2
D02 F449

IN ASSOCIATION WITH:

VIRTUS PROJECT MANAGMENT
5th Floor
The Glass House
11 Coke Lane
Dublin 7
D07 WNP2

ISSUE DATE: JANUARY 2021

1.0 EXECUTIVE SUMMARY

Ardstone Homes Limited (Ardstone)[1] is seeking permission for additional residential development on a site of c. 15 hectares of land within the Firhouse/Ballycullen Electoral Division of South Dublin, just outside the M50 motorway. These lands are adjoined by the M50 motorway to the north, Green Acres house and the Stocking Lane Residential Caravan Park to the east, undeveloped fields to the south, and the existing Stocking Wood residential development to the west.



Figure 1.1: Indicative Site Location Plan, prepared by TPA, 2021.

The combined development is expected to comprise a maximum of 659 No. units, including 151 No. 1-bedroom units, 198 No. 2-bedroom units, 151 No. 3-bedroom units, 132 No. 4-bedroom units and 27 No. 5-bedroom units along with all associated car parking, landscaping and service works once completed, as indicated in Table 1.1.

Table 1.1: Proposed Schedule of Accommodation – Combined Developments

Unit Type	*North*	*South*	*East*[2]	*Central*	*Combined*	*% of Total*
1-bed units	-	-	93	58	**151**	**23%**
2-bed units	-	-	148	50	**198**	**30%**
3-bed units	81	41	-	29	**151**	**23%**
4-bed units	84	48	-	-	**132**	**20%**
5-bed units	10	17	-	-	**27**	**4%**
Total Units	**175**	**106**	**241**	**137**	**659**	**100%**

[1] Ardstone Homes Limited, 48 Fitzwilliam Square, Dublin 2, D02 EF89
[2] Subject Application.

1.1 Schools' Demand Assessment

With respect to this development, Ardstone have requested that a schools' demand assessment be undertaken for the Firhouse/Ballycullen area to determine the existing level of school services provision and potential requirement for additional facilities at this location. An audit was undertaken by Tom Phillips + Associates utilising desktop methods in April 2020 and subsequently updated in October 2020 which can be summarised as follows:

- The proposed development is likely to generate a total indicative population of 1,812 No. persons, of which an estimated 507 No. children will be school age (i.e., 309 No. primary and 198 No. post-primary school children), as per the most recent 2016 Census figures for South Dublin.

- The subject site is located within the Rathfarnham School Planning Area identified by the Department of Education and Skills (DES), where there are 11 No. primary schools and 8 No. post-primary schools currently in operation, with an enrolment of c. 4,200 No. primary students and c. 4,100 No. post-primary students.

    - The existing network of schools demonstrated low levels of growth in the recent period (c. 2-4% from 2011-2016) and is likely to experience decreased enrolment of c. 5% at the primary level and increased enrolment of c. 13% at post-primary level from 2019-2024 with respect to DES projections for the Dublin region.

- The DES has not identified a requirement for any new primary or post-primary schools within the Rathfarnham SPA in the short-term establishment period (i.e., 2019-2022). However, one new primary school and two new post-primary schools are under development within neighbouring feeder areas which will provide an additional 16 No. primary classrooms and 2,000 No. post-primary places in the region.

    - It is considered that the future demand generated by the proposed development (i.e., 309 No. primary and 198 No. post-primary places) is likely be absorbed by the existing schools' network and other planned schools currently under development within the area.

2.0 DEMOGRAPHIC ANALYSIS

For the purposes of the demographic analysis, the study area comprises 2 No. distinct enumeration areas identified by the Central Statistics Office (CSO) of relevance to the subject development, as follows: 1) the local Firhouse/Ballycullen Electoral Division (ED) boundary to which the subject site belongs; and 2) the larger South Dublin county administrative boundary. These enumeration areas (identified in Figure 2.1 overleaf) provide demographic information for the local and regional populations which are likely to be impacted by the subject development.



Figure 2.1: Extent of CSO enumeration areas utilised in demographic analysis. Location of subject site within the Firhouse-Ballycullen ED indicated by red polygon. Source: CSO, annotated by TPA, 2021.

The proposed development site is located within the 'Firhouse/Ballycullen' Electoral Division (ED), which had a population of 8,230 No. persons at the time of the 2016 Census. This area appears to be growing at a faster pace than the rest of the county and state, with a c.25% population increase over the recent 10-year period compared to the c. 12-13% increase recorded for South Dublin and Ireland (see Table 2.1).

Table 2.1: Recent Population Trends

Level	Name	2006	2011	2016	5-yr	10-yr
ED	Firhouse/Ballycullen	6,610	7,773	8,230	+5.9%	+24.5%
County	South Dublin	246,935	265,205	278,767	+5.1%	+12.9%
State	Ireland	4,239,848	4,588,252	4,761,865	+3.8%	+12.3%

The majority of the study area population falls within the Adult (24-64 years) age cohort comprising 56% of the total population, which is on par with the county average for this group. The Primary and Post-Primary School cohorts form a slightly higher percentage of the overall cohort within the Firhouse/Ballycullen than the county average, at 13% and 10% respectively, while the Preschool cohort is similar to elsewhere in the county at 8%.

Table 2.2: Population of Study Area by Age Cohort (CSO 2016)				
Age Cohort	**Firhouse/ Ballycullen**	**% of Total**	**South Dublin**	**% of Total**
Preschool (0-4 yrs)	682	**8%**	21,733	**8%**
Primary School (5-12 yrs)	1,076	**13%**	34,665	**12%**
Post-Primary School (13-18 yrs)	786	**10%**	22,270	**8%**
Young Adults (19-24 yrs)	686	**8%**	19567	**7%**
Adults (25-64 yrs)	4,615	**56%**	149,607	**54%**
Older Adults (65+ yrs)	385	**5%**	30,925	**11%**
Total	**8,230**	**100%**	**278,767**	**100%**

2.1 Demand Generated by Proposed Development

The proposed development will comprise a maximum of 659 No. units of various typologies as indicated in Table 2.3. The average household size recorded by the 2016 Census was 2.75 No. persons per household[3], which generates a total indicative population of 1,812 No. persons when applied to the proposed development. It is assumed that only the 508 No. proposed units of 2-bedrooms or more can reasonably accommodate families, which would comprise c. 1,396 No. persons within the development.

Table 2.3: Proposed Schedule of Residential Units – Combined Developments		
Unit Type	**No. of Units Proposed**	**% of Total Development**
1-bedroom units	**151**	**23%**
2-bedroom units	**198**	**30%**
3-bedroom units	**151**	**23%**
4-bedroom units	**132**	**20%**
5-bedroom units	**27**	**4%**
Total Units	**659**	**100%**

The average number of children per family recorded in the State in Census 2016 was 1.38 children[4], which generates an indicative population of 701 No. children (between the ages of 0-18 years) when applied to the number of units that can accommodate families within the proposed development.

Of this figure, an estimated 507 No. children would be considered school age (including 309 No. primary school children and 198 No. post-primary school children), as per the age cohorts recorded for South Dublin[5] in 2016 (see Table 2.4).

[3] Source: https://www.cso.ie/en/releasesandpublications/ep/p-cp4hf/cp4hf/hhlds/
[4] Source: https://www.cso.ie/en/releasesandpublications/ep/p-cp4hf/cp4hf/
[5] Source: https://www.cso.ie/px/pxeirestat/Statire/SelectVarVal/Define.asp?maintable=E3003&PLanguage=0

Table 2.4: Breakdown of 0-18 Year Age Cohort for South Dublin (2016 CSO)		
Age Group	**2016 Population**	**% of Total Cohort**
Pre-school children (0-4 years)	21,733	27.6%
Primary school children (5-12 years)	34,665	44.1%
Secondary school children (13-18 years)	22,270	28.3%
All children (0-18 years)	**78,668**	**100%**

With respect to these calculations, the development has the potential to generate an additional 1,812 No. persons within the area, including an estimated 507 No. school-age children (including 309 No. primary school children and 198 No. post-primary school children), when the proposal is fully occupied.

3.0 CURRENT SCHOOLS' CAPACITY

The proposed development site is located within the Rathfarnham School Planning Area (SPA) identified by the Department of Education and Skills (DES) as shown in Figure 3.1 and 3.2 overleaf, which is adjoined by the Ballinteer Stepaside DLR School Planning Area to the east and the Firhouse Oldbawn School Planning Area to the west. The Rathfarnham School Planning Area, to which the subject site belongs, is bounded roughly by the Dodder River in the north near Terenure to Tibradden Wood and Glendoo Mountain in the south and comprises 11 No. existing primary schools and 8 No. post-primary schools.

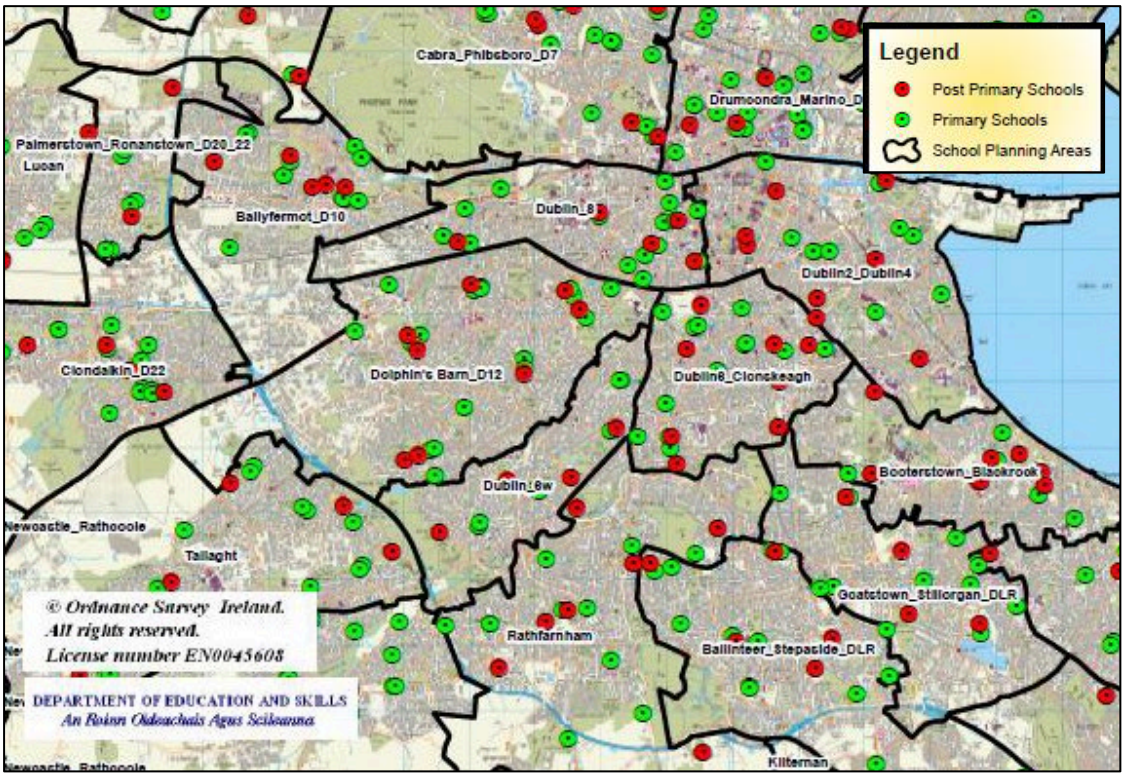


Figure 3.1: Extract of Dublin School Planning Areas (SPAs) identified by the Department of Education and Skills (DES) in the vicinity of the proposed development site, including the subject Rathfarnham School Planning Area.

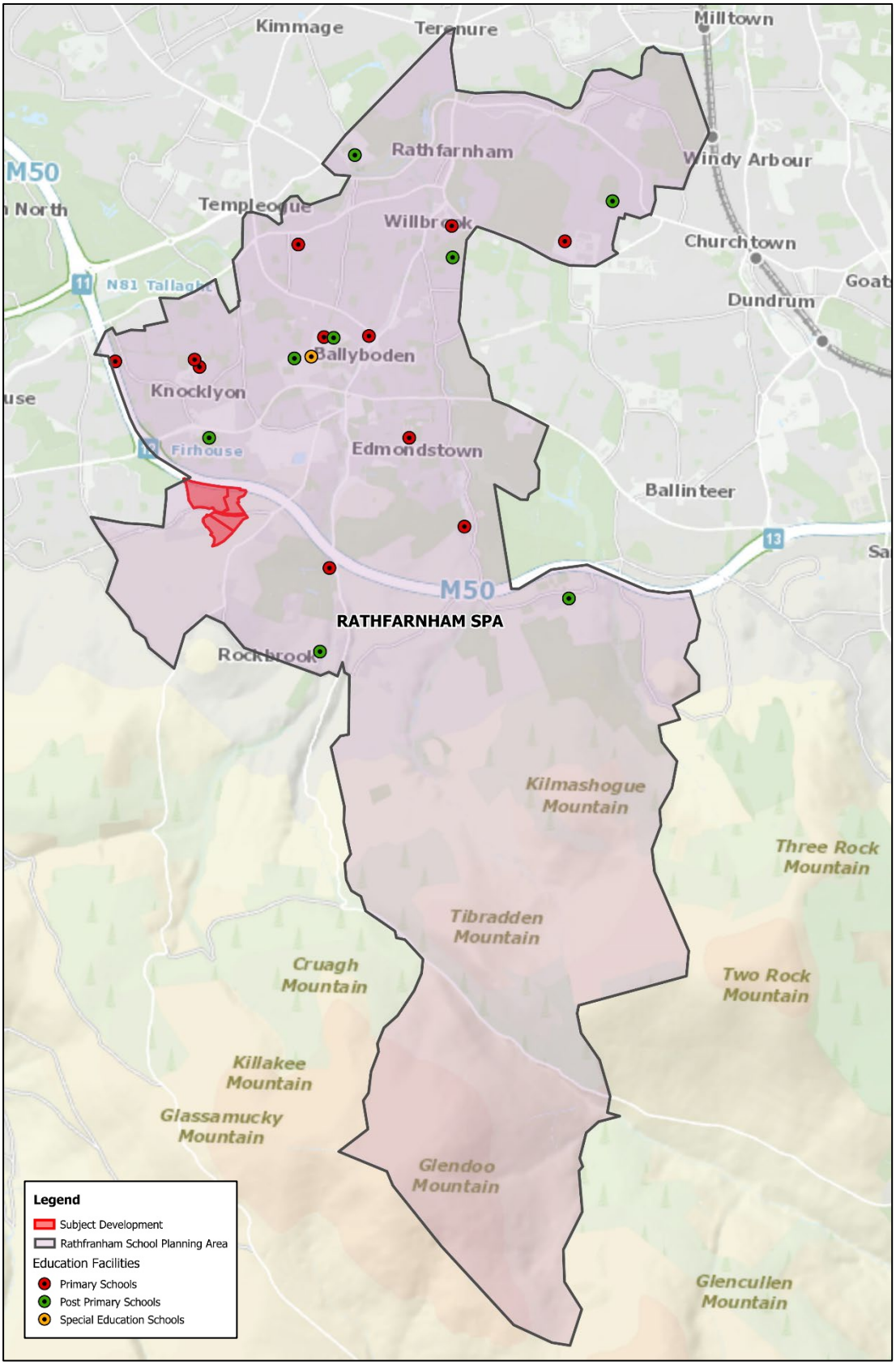


Figure 3.2: Extent of Rathfarnham SPA, with location of subject development indicated by red polygon. (Source: OSi basemap, annotated by TPA, 2021.) See Figures 3.3-3.4 for identification of schools.

3.1 Primary Schools

The 11 No. existing primary schools identified within the Rathfarnham School Planning Area held a combined provisional enrolment of 4,194 No. students during the 2019-2020 school year as per Department of Education and Skills (DES) records. We note that of this cohort, there were 9 No. co-educational (mixed) schools and 2 No. all-boys schools identified. The primary schools located nearest to the subject site (incl. Edmondstown National School (SN Bhaile Eamonn), St. Colmcille SNS and Scoil Colmcille Naofa) held a combined enrolment of c. 1600 No. students in 2019/20.

Table 3.1: Recorded Enrolments for Primary Schools

No.	Roll No.	School Name	2019/20 Enrolment[6]
1	03359N	Ballyroan BNS (Boys)	401
2	11638N	Whitechurch NS (Mixed)	213
3	14939T	Rathfarnham Parish NS (Mixed)	227
4	17953F	SN Bhaile Eamonn (Mixed)	103
5	19114T	Scoil Naomh Pádraig (Mixed)	562
6	19446V	Scoil Mhuire Boys (Boys)	444
7	19474D	Scoil Colmcille Naofa (Mixed)	788
8	19490B	Scoil Mhuire (Mixed)	228
9	19742C	St. Colmcille Senior NS (Mixed)	796
10	19939V	Scoil Naisiunta An Dea Aoire (Mixed)	210
11	20043G	Gaelscoil Chnoc Liamhna (Mixed)	222
		Total	**4,194**

There is also 1 No. additional special education facility located within the Rathfarnham School Planning Area, Saplings Special School, which held a provisional enrolment of 30 No. students during the 2019-2020 school year. See Figure 3.3 overleaf for location of existing schools. See Figure 3.3 overleaf for location of existing schools.

Table 3.2: Recorded Enrolments for Special Education Schools

No.	Roll No.	School Name	2019/20 Enrolment[7]
1	20372C	Saplings Special School	30
		Total	**30**

[6] Department of Education and Skills – This data is provisional and was published in December 2019. The source for this data is the National School Annual Census for 2019/2020, which is returned via the Primary Online Database (POD. This includes both the Mainstream Census and the Special School Annual Census. Data is anchored on the census date of 30th September 2019. Note that only schools aided by the Department of Education and Skills are included in this list.
[7] See footnote No. 7 above for reference.

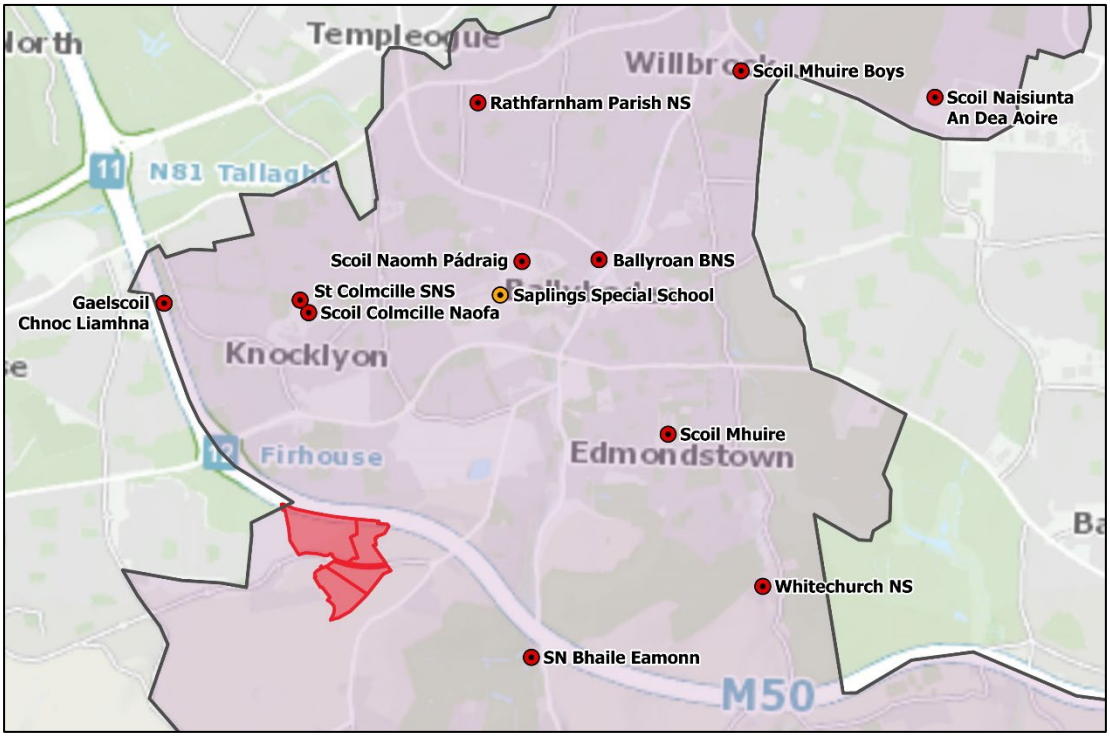


Figure 3.3: Location of primary schools within Rathfarnham SPA. Location of subject development indicated by red polygon. (Source: OSi basemap, annotated by TPA, 2021.)

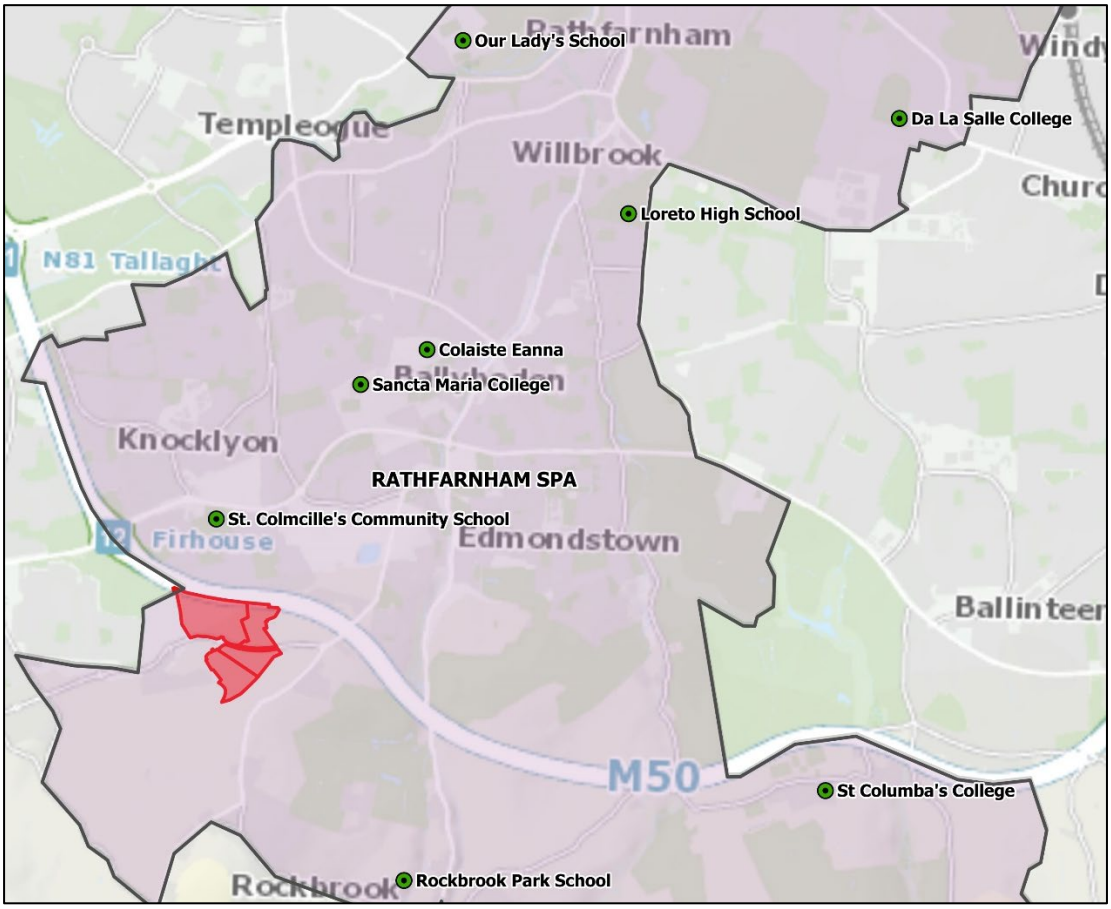


Figure 3.4: Location of post-primary schools within Rathfarnham SPA. Location of subject development indicated by red polygon. (Source: OSi basemap, annotated by TPA, 2021.)

3.2 Post-Primary Schools

The 8 No. post-primary schools identified within the Rathfarnham School Planning Area held a combined provisional enrolment of 4,120 No. students during the 2019-2020 school year, as per Department of Education and Skills (DES) records. Of this cohort, 2 No. facilities were reported as having co-educational (mixed) enrolment, 3 No. facilities were all-boys and 3 No. facilities were all-girls schools. The post-primary school located nearest to the subject site (St. Colmcille's Community School) held an enrolment of 730 No. students in 2019/20.

Table 3.3: Recorded Enrolments for Post-Primary Schools

No.	Roll No.	School Name	2019/20 Enrolment[8]
1	60310E	Da La Salle College (Boys)	320
2	60320H	St Columba's College (Mixed)	333
3	60321J	Rockbrook Park School (Boys)	163
4	60340N	Loreto High School (Girls)	660
5	60341P	Sancta Maria College (Girls)	549
6	60342R	Colaiste Eanna (Boys)	601
7	60860Q	Our Lady's School (Girls)	764
8	91510M	St. Colmcille's Community School (Mixed)	730
		Total	**4,120**

4.0 HISTORIC ENROLMENT STATISTICS

Historic enrolment trends for the Rathfarnham School Planning Area show mixed growth and decline at the primary school level for the historic 5-year interval, with an overall increase of 178 No. students within the cohort from 2015/16 to 2019/20. The primary school nearest to the subject site, Edmondstown National School (SN Bhaile Eamonn), recorded a c. 14% increase in enrolments in the recent 5-year period.

Table 4.1: Historic Change in Enrolment (Primary) in Recent 5-year Period

Rathfarnham Area		Enrolment Year		Historic Change (5-year)
Roll No.	School Name	15/16	19/20	
03359N	Ballyroan BNS	356	401	+45
11638N	Whitechurch NS	183	213	+30
14939T	Rathfarnham Parish NS	232	227	-5
17953F	SN Bhaile Eamonn	90	103	+13
19114T	Scoil Naomh Pádraig	516	562	+46
19446V	Scoil Mhuire Boys	458	444	-14
19474D	Scoil Colmcille Naofa	815	788	-27
19490B	Scoil Mhuire	240	228	-12
19742C	St Colmcille Senior NS	709	796	+87
19939V	Scoil Naisiunta An Dea Aoire	181	210	+29
20043G	Gaelscoil Chnoc Liamhna	236	222	-14
	Total	**4,016**	**4,194**	**+178**

[8] See footnote No. 7 above for reference.

With respect to post-primary schools in the area, enrolment rates have broadly increased in the recent 5-year period, as shown in Table 4.2, with all but 2 No. schools recorded as having increased enrolments from 2015/16 to 2019/20. The secondary school closest to the subject site, St. Colmcille's Community School, demonstrated only a c. 2% growth in enrolments the past 5 years.

Table 4.2: Historic Change in Enrolment (Post-Primary) in Recent 5-year Period

Rathfarnham Area		Enrolment Year		Historic Change (5-year)
Roll No.	**School Name**	**15/16**	**19/20**	
60310E	Da La Salle College	401	320	-81
60320H	St Columba's College	282	333	+51
60321J	Rockbrook Park School	157	163	+6
60340N	Loreto High School	631	660	+29
60341P	Sancta Maria College	478	549	+71
60342R	Colaiste Eanna	617	601	-16
60860Q	Our Lady's School	763	764	+1
91510M	St. Colmcille's Community School	713	730	+17
	Total	**4,042**	**4,120**	**+78**

4.1 Future Growth Projections

The Department of Education and Skills (DES) reported in July 2019 that enrolment figures for primary schools in Ireland were likely to have reached peak levels in the previous year (2018) and fall gradually from 2019 onward, in line with revised migration and fertility assumptions for the country as a whole (see Figure 4.1 overleaf). The latest statistical release[9] by the DES in this respect states:

> *"For the country as a whole, **primary enrolments, which have risen substantially in recent years, are projected to have peaked in 2018,** when total enrolments stood at 567,772. This high point in 2018 came at the end of a sustained period of growth…**Enrolments are projected to fall by 134,000 pupils over the coming years (under the M2F2 scenario)[10], reaching a low point of 433,795 by 2036.** Annual falls will average 10,650 pupils per year between 2021 and 2028."*
>
> *[DES Enrolment Projections – **Our emphasis**.]*

It is anticipated that post-primary enrolments, however, will continue to rise in the medium-term and will likely reach record levels in 2024 (see Figure 4.2 overleaf). The DES report[11] states:

> *…(post-primary) **enrolments will follow a pattern of distinct increases out to 2024 followed by one of decreases.** More specifically, **total enrolments will peak in 2024,** with marginal falls in 2025 before more dramatic falls from 2026 onwards."*
>
> *[DES Enrolment Projections – **Our emphasis**.]*

[9] Source: *Projections of Full-Time Enrolment: Primary and Second Level, 2018-2036 (DES, July 2019), p.5*
[10] M2F2 is a scenario which assumes a moderate level of inward migration (20,000), and a decline in the Total Fertility Rate (TFR) from 1.8 to 1.6 between 2016 and 2031.
[11] Source: *Projections of Full-Time Enrolment: Primary and Second Level, 2018-2036 (DES, July 2019), p. 16*

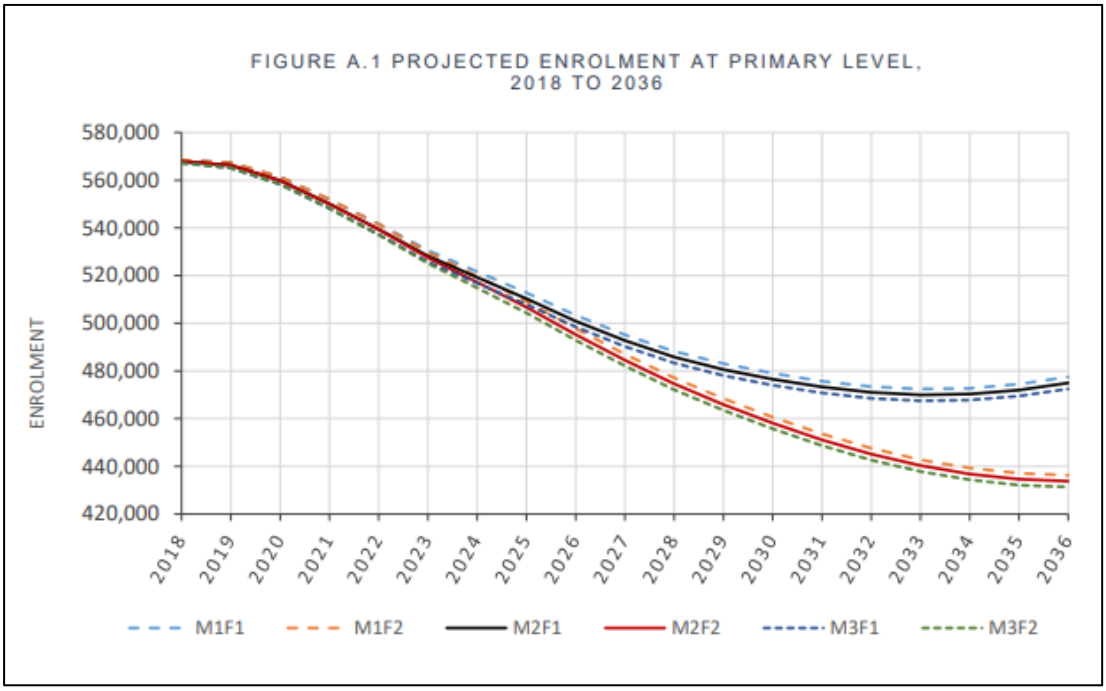


Figure 4.1: Projections of Enrolment at Primary Level, 2018–2036, organized by growth projection scenarios created by the CSO. (Source: DES, July 2019).

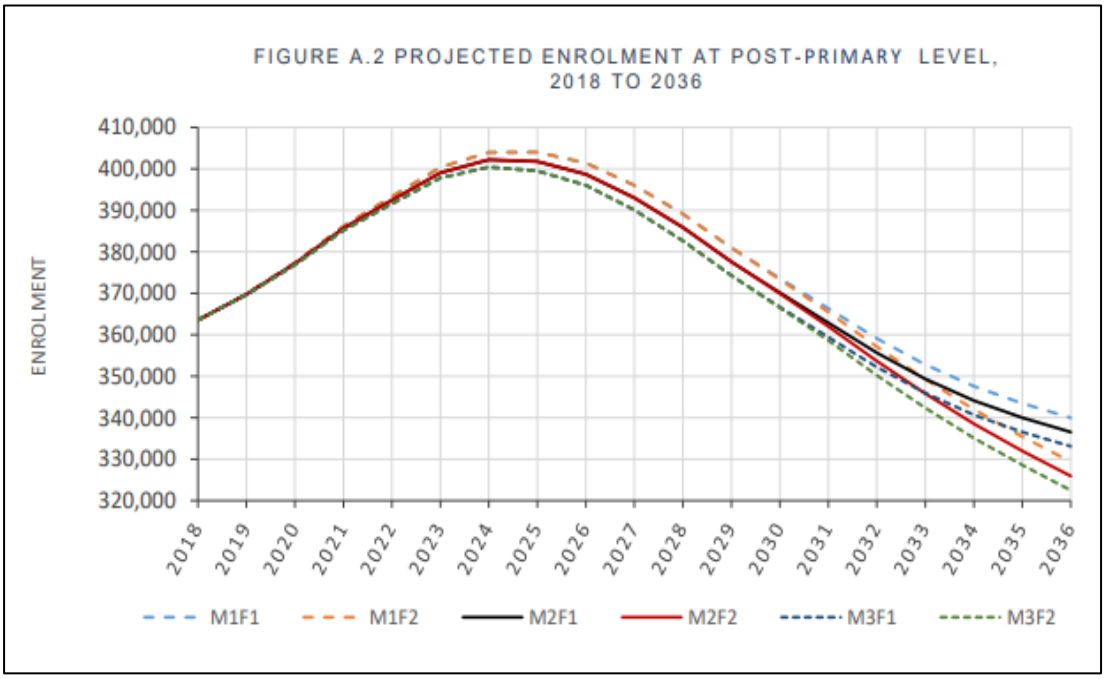


Figure 4.2: Projections of Enrolment at Post-Primary Level, 2018–2036, organized by growth projection scenarios created by the CSO. (Source: DES, July 2019).

4.1.1 Potential Impact on Rathfarnham Schools

If the regional population projection from the 'M2F2' scenario[12] for primary schools is applied to the current enrolment figures within the Rathfarnham School Planning Area, a decrease of c. 5% could be expected at the primary level by the 2024/25 enrolment year, an estimated reduction of 214 No. students across the 11 No. existing schools. At the post-primary level, an increase of c. 13% or 529 No. students, could be expected by 2024/25 as shown in Table 4.4.

We note that the indicative change figures provided are an estimate of potential enrolments at each school level based on the regional population projections included in the DES report[13] and do not represent localized values.

Table 4.4: Projected Enrolment Trends – 2019 to 2024

Rathfarnham School Planning Area	Enrolment Year		Future Trends (5-year)	
	19/20	24/25[14]	% Change	Est. Change
Primary Schools (11 No. schools)	4,194	3,980	5% decrease	-214
Post-Primary Schools (8 No. schools)	4,120	4,649	13% increase	+529

5.0 PLANNED SCHOOL PROVISION

5.1 *South Dublin County Council Development Plan 2016-2022*

The *South Dublin County Council Development Plan 2016-2022* (SDP) provides a holistic assessment of educational needs and has regard to the requirements of *The Provision of Schools and the Planning System, A Code of Practice for Planning Authorities (DES & DEHLG, 2008)* and *Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas 2009* in its identification of school sites throughout the county. With respect to the development of additional schools within the study area, the SDP states:

> ***"The Department of Education and Skills will commence a new phase of school building during the period 2016-2022. The Department has identified a need for additional post primary schools in South Dublin County up to 2026.*** *Schools in Lucan (Kishoge Community College), Tallaght (Kingswood) and Rathcoole (Holy Family Community School) are under construction or at design stage.*
>
> ***Demand for further provision is also identified in*** *the Lucan; Saggart/Citywest; Newcastle/Rathcoole;* ***Knocklyon/Firhouse/Ballycullen areas****. The Department identifies a possible requirement for further provision in the Lucan and Dublin 24 areas particularly, although other areas may also require some level of additional provision."*
>
> *[Section 3.11.0, SDP –* ***Our emphasis****.]*

[12] The CSO's Regional Population Projections utilise six variant scenarios with relative assumptions in relation to regional fertility, mortality trends and external migration from and to each region. The Department has chosen M2F2 as the most likely scenario regarding migration and fertility, which encompasses the assumption of medium migration and fertility falling from 1.8 to 1.6 over the course of next 12 years. prior to this, the Department focussed on M2F1 as the most likely scenario, but with fertility continuing to fall it is prudent to switch to the lower overall fertility assumption.

[13] Source: *Projections of Full-Time Enrolment: Primary and Second Level, 2019-2036 (DES, July 2019), Dublin Region - Table 3 and Table 7.*

[14] Figure estimated using the projected decrease of c. 5.09% at primary level and increase of c. 12.84% at post- primary level from 2019 to 2024 as per M2F2 scenario. See Footnote No. 13 above for reference.

Relevant policies for the development of primary and post-primary schools are also set out in Ch. 3 of the SDP, as shown in Table 5.1. We note that *C9 Objective 2* and *Objective 10* of the Plan makes specific reference to the requirement for a secondary school within the Firhouse/Ballycullen area, separate to the primary school development on Carrigwood Green.

Table 5.1: Selected Policies/Objectives for Community Infrastructure (SDP) - Schools	
Policy C9 (a)	*It is the policy of the Council* ***to work in conjunction with the relevant education authorities to promote and support the provision of primary and post-primary schools in the County.***
Policy C9 (b)	*It is the policy of the Council* ***to engage with the Department of Education and Skills and to support the Department's School Building Programme*** *by actively identifying sites for primary and post primary schools at suitable locations, based on forecast need.*
C9 Objective 1:	*To engage with the Department of Education and Skills and support the Department's School Building Programme by actively identifying sites for primary and post primary schools, based on forecast need.*
C9 Objective 2:	***To support and facilitate the provision of additional post primary schools*** *in Kingswood (Tallaght); Lucan; Saggart/Citywest; Newcastle/Rathcoole; and* ***Ballycullen/Firhouse/Knocklyon areas.***
C9 Objective 3:	***To reserve sites for primary and post-primary school provision in developing areas through approved Local Area Plans and Planning Schemes****, in consultation with the Department of Education and Skills.*
C9 Objective 4:	*To require schools 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.*
C9 Objective 10:	***That a secondary school be built in the Firhouse/Ballycullen area over the lifetime of this plan to cater for the school going children of that area.*** *Having regard to the primary school developments on Carrigwood Green this objective should be met without further new school development on that site.*
C9 Objective 11:	*To facilitate the development of all new schools and extensions* ***planned as part of the Government's School Building Programme 2016-2021.***
	Our emphasis.

5.2 *Ballycullen-Oldcourt Local Area Plan 2014 (Extended)*

The proposed development site is located within the Ballycullen-Oldcourt Local Area Plan boundary and therefore guidance for the development of community infrastructure, including schools, within the subject development is provided by the *Ballycullen-Oldcourt Local Area Plan 2014 (Extended).* With respect to residential development within the Plan are, the LAP states that for planning applications for 100 No. residential units or more, a school demand assessment is to be provided (Obj. LUD11), as addressed in this report (see Table 5.2).

Table 5.2: Selected Policies for the Development of Community Infrastructure (LAP) - Schools	
Objective LUD11	*Planning applications for 100 or more dwellings shall be accompanied by a report identifying the demand for school places likely to be generated by the proposal and the capacity of schools in the vicinity to cater for such demand.*

Objective LUD12	*Each of the two primary school sites designated under this LAP shall measure at least 1.8 hectares and shall each be set aside for the development of a primary school. The Post-Primary School, if provided, shall comply with the minimum space requirements of the Dept. of Education and Skills. Further to a Material Alteration of the Local Area Plan, the Oldcourt/Gunny Hill School Site designated under this Plan has been increased by 1.2 acres to allow for two primary schools (a third school on the Plan Lands) at this location…*
	Our emphasis.

The LAP also identifies 2 No. school sites within the boundary of the Plan, at Stocking Avenue (1.8 ha) and Oldcourt-Gunny Hill (2.3 ha). Site-specific objectives for the development of each site are included in Appendix A. We note that these school sites have designated to accommodate 2 No. primary schools and/or 1 No. post-primary school within the lifetime of the LAP, however neither of the school sites are located within the subject development area.



Stocking Avenue Primary School Site



Oldcourt-Gunny Hill School Site



Figure 5.2: Extract from Ballycullen-Oldcourt Local Area Plan showing location of proposed school sites (in yellow) in relation to subject development (indicated by red stars). (Source: SDCC, annotated by TPA 2021.)

5.2.1 Phasing of Facilities and Amenities

With respect to the provision of housing within Ballycullen-Oldcourt, the Local Area Plan divides the Plan Lands into eastern and western sections under 4 No. distinct phases of development to ensure that key pieces of infrastructure are delivered in a sequential manner. The LAP was amended in 2017 to include a requirement for additional educational facilities, as follows:

> *"Further to Council Meeting on the 13th March 2017,* ***it has been decided that a primary school on the eastern section of the Local Area Plan lands and a primary school and / or post primary school on the western section of the Local Area Plan lands will be required to meet the existing and future population needs of the Plan Lands and its surrounding suburban hinterland."***
>
> *[Executive Summary, LAP –* ***Our emphasis****.]*

We note that the key outcomes for educational facilities required for the progression of Phases 1-3 on the Eastern side of the Plan Lands have been met (see Table 5.3); however, the Planning Application submitted under Ref. SD18A/0204 (including outline permission for an educational campus comprising a primary school and post-primary school development) was refused by An Bord Pleanála in 2019.

For progression to Phase 4, commencement of construction of a school facility is required on either the eastern or western side of the Plan Lands. It does not appear that any Applications for additional schools' development had been lodged with the Planning Authority for the designated sites as of September 2020[15] and at a national level, no new schools were proposed to be delivered within the Rathfarnham School Planning Area in the short term under the school building programme (i.e., 2019-2022, see Section 5.3 to follow).

Table 5.3: Phasing Strategy for Eastern Side of Plan Lands (LAP)

Type	Extract of Key Outcomes Required - Education	Status
Phase 1 - Phase 2	*Site made available for the construction of a Primary School on the eastern side of the Plan lands or a Primary School and/or Post-Primary School on the western side of the Plan Lands.*	Site locations designated for school development within LAP.
Phase 3	*Commencement of planning process for the provision of a school on the designated Primary School site on the eastern side of the Plan Lands OR on the designated Primary School and/or Post-Primary school site on the western side of the Plan Lands.*	Ref. SD18A/0204 incl. outline permission for educational campus submitted and was subsequently refused by ABP in 2019.
Phase 4	*Commencement of construction of the designated Primary School on the eastern side of the Plan lands and the Primary School and/or Post-Primary School on the western side of the Plan Lands.*	No other applications for development at these locations have been progressed to date (July 2020). See Section 5.3 for relevant DES schemes.

Please refer to Section 5.4 of the *Material Contravention Statement*[16] enclosed with the Application for more details of the subject development's position within this Phasing Strategy.

[15] As per an online search of the SDCC Online Planning Applications Viewer conducted by TPA in September 2020.
[16] *Material Contravention Statement (October 2020)* as prepared by Tom Phillips + Associates.

5.3 *New Schools to be Established from 2019 to 2022*

The Department of Education and Skills (DES) announced in April 2018 that more than 40 No. new primary and post-primary schools are to be established throughout the country by 2022[17]. No new primary or post-primary schools are identified within the Rathfarnham School Planning Area at this time, however, the requirement for new schools will be subject to on-going review. There were 3 No. new schools proposed to open by 2020 within the neighbouring feeder areas of Dublin 6/6W and Firhouse (see Table 5.4), which will provide additional accommodation for 16 No. primary classrooms and 2,000 No. post-primary students.

Table 5.4: New Schools to Be Established in Neighbouring Feeder Areas 2019-2022 (DES)[18]

Type	School Planning Area	Size	To Open
Primary	D6_Clonskeagh & D6W (Regional Solution)	16 classrooms	2019
Post-Primary	D6_Clonskeagh & D6W (Regional Solution)	1000 pupils	2020
Post-Primary	Firhouse, Dublin 24	1000 pupils	2018

With respect to other large-scale education projects in the vicinity of the Rathfarnham School Planning Area, there were 7 No. school facilities identified under the DES school building programme currently under development (see Table 5.5), including 2 No. schools in Rathfarnham (i.e., Loreto Primary and Gaelcholáiste an Phiarsaigh).

The new post-primary school previously identified for the Firhouse Planning Area (i.e., Firhouse Educate Together Secondary School (ETSS)), opened in August 2018 in interim accommodation within Firhouse Educate Together National School[19]. The site acquisition process for a permanent location was ongoing as of September 2020. It appears that sites have also been secured for the primary and post-primary schools within D6/6W, with Harold's Cross ETNS having opened in temporary accommodation in September 2019[20].

Table 5.5: Status of Large-Scale Projects in Vicinity of Rathfarnham School Planning Area[21]

Ref.	Roll No.	School Name & Address	Status
75	00729F	Loreto Primary, Rathfarnham	Stage 2a (Developed Sketch Scheme)
92	20400E	Ballinteer ET, D16	Stage 3 (Tender Stage)
100	20520O	D6 Clonskeagh D6W (Regional Solution) Primary, Harold's Cross ETNS	School opened in September 2019 in interim start-up accommodation on its permanent site. Site Secured. Stage 2a (Developed Sketch Scheme)
106	68161H	Gaelcholáiste an Phiarsaigh, Rathfarnham	Stage 1
107	68241F	Stepaside ETSS, D16	Stage 2b (Detailed Design)

[17] Source: https://www.education.ie/en/Press-Events/Press-Releases/2018-press-releases/PR18-04-13.html
[18] Source: https://www.education.ie/en/Press-Events/Press-Releases/2018-press-releases/PR18-04-13.html
[19] Source: http://www.echo.ie/tallaght/article/new-educate-together-secondary-school-opens
[20] Source: https://www.educatetogether.ie/schools/2019-primary-schools/harolds-x-etns/
[21] Extracted from *Current status of large-scale projects being delivered under the school building programme* list published 30 September 2020. Source: https://www.education.ie/en/Schools-Colleges/Services/Building-Works/Major-Projects/current-status-of-large-scale-projects.pdf

131	20043G	Gaelscoil Cnoc Liamha, D16	Stage 3 (Tender Stage)
156	68307J	Firhouse ET Secondary School, D24	Opened in temporary accommodation August 2018. Site Acquisition Process Stage 1 (Preliminary Design)
165	68365A	D6 Clonskeagh D6W (Regional Solution) Post Primary	School to open in 2020. Site Secured. Stage 2a (Developed Sketch Scheme)

6.0 CONCLUSION

There are 11 No. existing primary schools and 8 No. post-primary schools currently operating in the Rathfarnham School Planning Area to which the subject site belongs. These facilities cater to a student population of c. 4,200 primary school students and c. 4,100 post-primary students and have demonstrated low levels of growth in the recent 5-year period (c. increase of 4% and 2% respectively from 2015/16 to 2019/20). With respect to future enrolments, we note that a c. 5% decrease in enrolments at the primary school level and a c. 13% increase in post-primary school enrolments is anticipated for the Dublin region from 2019/20 to 2024/25, with respect to the most recent regional population projections published by the Department of Education and Skills.[22]

The need for additional educational facilities within the county is established in the *South Dublin Development Plan 2016-2022*, which specifically references the requirement for a secondary school at Firhouse/Ballycullen in *C9 Objective 10*. This school opened in interim accommodation in August 2018 and was in the site acquisition phase for a permanent location as of August 2020, as per DES records.

While there is no explicit requirement for a new school identified within the subject development lands, there are 2 No. other primary and/or post-primary school sites designated within the current *Ballycullen-Oldcourt Local Area Plan 2014 (Extended)* at Stocking Avenue and Oldcourt-Gunnyhill of relevance to residential development within the area. We note that these lands are in separate ownership to the subject lands and are unrelated to the proposed development. It does not appear that any development works have been progressed to date at either location.

At a national level, no new schools were proposed to be delivered within the Rathfarnham School Planning Area in the short term under the school building programme (i.e., 2019-2022), despite the aforementioned designation of school sites within the relevant development plans. However, one new primary school and two new post-primary schools were scheduled to open within the neighbouring feeder areas of Firhouse and Dublin 6/6W by 2020.

As these facilities will increase the availability of places for future students in the short- to medium-term by providing 16 No. new primary classrooms and 2,000 No. new post-primary school places within the region, it is considered that the future demand generated by the proposed development (i.e. 507 No. places - including 309 No. primary and 198 No. post-primary school children) is likely be absorbed by the existing schools network and other planned schools currently under development within the area.

[22] Source: *Projections of Full-Time Enrolment: Primary and Second Level, 2019-2036 (DoES, July 2019)*

Appendix 1: Ballycullen-Oldcourt Local Area Plan 2014 (Extended) Site-Specific Objectives for Schools Development – Stocking Ave and Oldcourt

Site-Specific Objectives for Schools Development (LAP)	
Stocking Avenue Primary School Site	• *A primary school site of at least 1.8 hectares shall be reserved on the western side of the Stocking Wood development in accordance with that designated under the South Dublin County Council Development Plan, 2010 - 2016. (Objective SSP1)* • *Any open green spaces and playing pitches developed as part of the primary school shall link with and integrate with the open space and sustainable urban drainage network planned under the Green Infrastructure Strategy (Section 5.3). (Objective SSP2)* • *The double ditch and associated open stream on the eastern side of the primary school site shall be protected and enhanced as part of any development. (Objective SSP3)* • *Surface water on the primary school site shall be intercepted by on-site SUDS features (i.e. green roofs, rainwater harvesters, soakaways and porous grass paviours for parking) and any runoff shall be discharged to the overall planned SUDS network. (Objective SSP4)* • *Development of the primary school site shall address Stocking Avenue to the north with relatively strong and continuous built frontage. Staff parking, safe queuing and safe drop-off facilities shall be located to the side (west) and/or rear (south) of the main primary school building. (Objective SSP5)* • *Pedestrian and cyclist access to any primary school development shall link with the pedestrian and cycle network planned under the Accessibility & Movement Strategy (Section 5.2) with access provided from Stocking Avenue and at least one more entrance along the western and/or southern sides of the primary school site. (Objective SSP6)* • *In the interest of pedestrian and cyclist safety and movement, development of the school site shall include for the upgrade of the existing adjacent roundabout junction on Stocking Avenue to a four-arm junction with pedestrian and cyclist crossing facilities. (Objective SSP7)*
Oldcourt School Site & Replacement Playing Pitches – Gunny Hill	• *No residential development shall commence on the lands that accommodate the GAA playing pitches off the Oldcourt Road, until such time as a site for replacement playing pitches have been provided on the Plan Lands. The 'Objective B' zoned lands to the south-east (between Gunny Hill and Oldcourt Lane) are designated under this LAP for such a facility, which should be shared with the adjacent designated school site. Floodlighting may be permissible subject to submission of Bat Surveys, retention and augmentation of hedgerows and provision of specialist lighting limits any impacts on bat species. Mitigating measures shall be sufficiently demonstrated and detailed at planning application stage. (Objective SSP14)* • *A primary school and/or post primary school site of at least 1.8 hectares shall also be reserved on the 'Objective B' zoned lands located within the Plan Lands between Gunny Hill and Oldcourt Lane. Further to a Material Alteration of the Local Area Plan, the site has been increased by 1.2 acres to allow for two primary schools at this location. (Objective SSP15)* • *Playing pitches and any open green spaces developed as part of the primary school site and/or post-primary school site shall link with and integrate with the open space and sustainable urban drainage network detailed under the Green Infrastructure Strategy (Section 5.3). (Objective SSP16)* • *Surface water on the primary school site and/or post-primary school site shall be intercepted by on-site SUDS features (i.e. green roofs, rainwater*

	harvesters, soakaways and porous grass paviors for parking) and any run-off shall be discharged to the SUDS network envisaged for the Plan Lands. (Objective SSP17) • *Pedestrian and cyclist access to any primary and/or post-primary school development shall link with the pedestrian and cycle network detailed under the Accessibility & Movement Strategy (Section 5.2). Vehicular access shall be designed to include safe queuing and drop-off facilities. (Objective SSP18)* • *The triangular field and its hedgerow boundaries located at the south-west corner of the planned Gunny Hill playing pitches shall be retained as a buffer between the Oldcourt Lane and the planned sports pitches and school as a biodiversity feature. (Obj. SSP19)*

APPENDIX 4 - DAYLIGHT AND SHADOW ANALYSIS

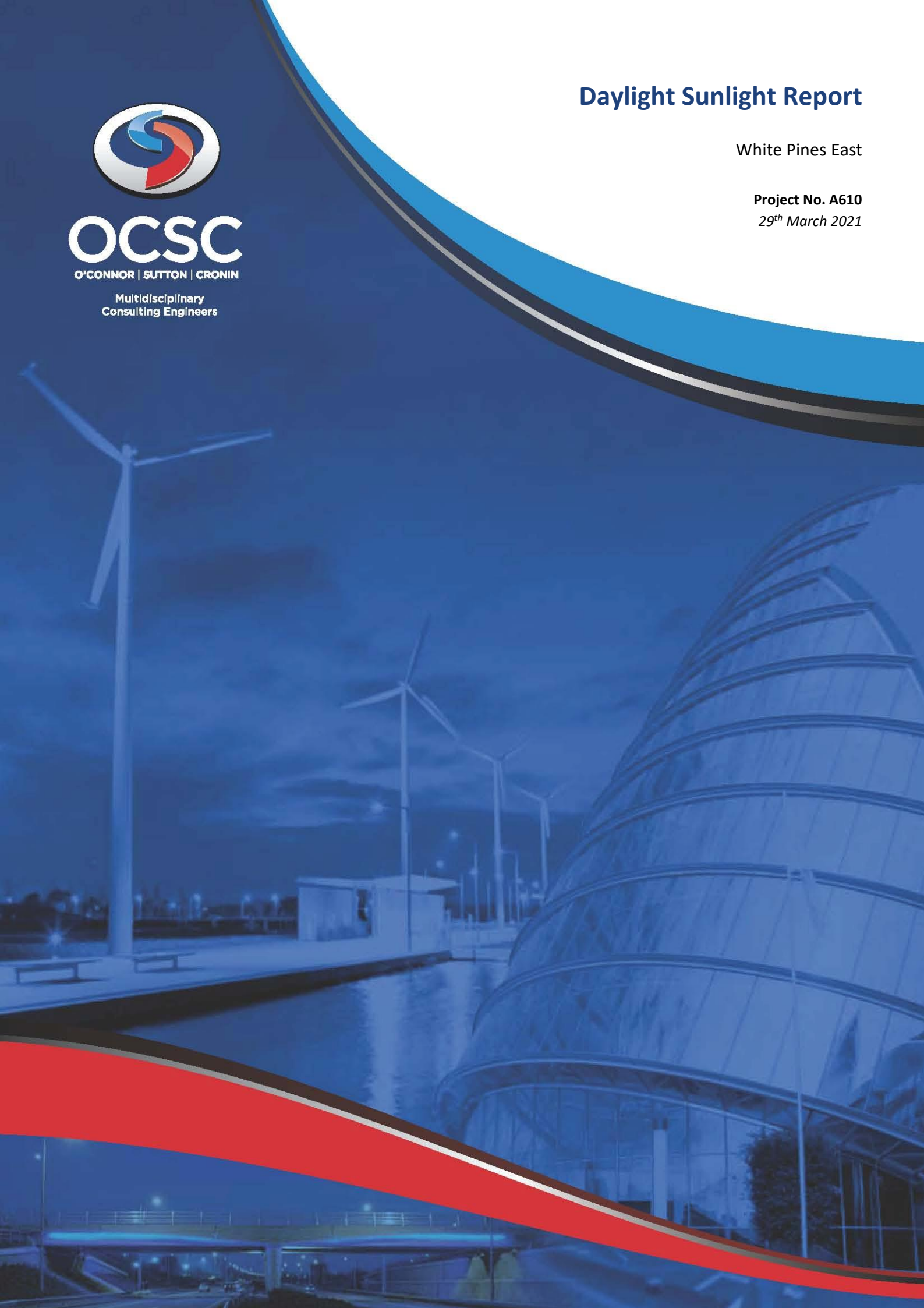
OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary
Consulting Engineers

Daylight Sunlight Report

White Pines East

Project No. A610

29th March 2021



Daylight Sunlight Report

NOTICE

This document has been produced by O'Connor Sutton Cronin & Associates for its Client Ardstone Capital Ltd. It may not be used for any purpose other than that specified by any other person without the written permission of the authors.

DOCUMENT CONTROL & HISTORY

OCSC Job No.: A610	Project Code	Originator Code	Zone Code	Level Code	File Type	Role Type	Number Series	Status/ Suitability Code	Revision
	A610	OCSC	XX	XX	RP	YS	0002	S4	P05

Rev.	Status	Authors	Checked	Authorised	Issue Date
5	For Planning	CA	DOC	DOC	29/03/2021
4	For Comment	CA	DOC	DOC	27/01/2021
3	For Planning	CA	DOC	DOC	08/06/2020
2	For Comment	CA	DOC	DOC	25/05/2020
1	For Comment	CA	DOC	DOC	09/04/2020

EXECUTIVE SUMMARY

OCSC have been appointed to carry out a Daylight/ Sunlight study for the White Pines East development located in Dublin 16.

The aim of the study is to record and analyse the results for the following:

- The daylight levels within the living and bedroom areas of selected apartments, to give an indication of the expected daylight levels throughout the proposed development;
- The expected sunlight levels within the living areas and bedrooms within the proposed development;
- The quality of amenity space, being provided as part of the development, in relation to sunlight;
- Any potential daylight or sunlight impact the proposed development may have on properties adjacent to the site.

The analysis confirms that across the entire development excellent levels of internal daylight are achieved, with a 98.6% compliance rate achieved across the proposed development. The majority of apartments not only meet but greatly exceed the ADF target set out.

It is important to note that the performance targets which are included should be used with a degree of flexibility as per the extract below from the BRE Guide:

"The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the designer. Although it gives numerical guidelines these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design."

The calculation methodology for daylight and sunlight is based on the British Research Establishments "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2011 Second Edition.

In relation to sunlight, the development shows compliance with BRE Guidelines receiving more than 2 hours of sunlight on more than half of the provided amenity spaces on March 21st.

The annual probable sunlight hours assessment has shown that even though some windows are slightly under the BRE recommendations, acceptable levels of sunlight will still be achieved within the proposed development.

The analysis also shows that the proposed development has negligible daylight or overshadowing impact to surrounding properties.

DAYLIGHT SUNLIGHT REPORT

INDEX **PAGE**

EXECUTIVE SUMMARY 3

1. INTRODUCTION 6
2. DEVELOPMENT DESCRIPTION 7
3. PROPOSED BUILDING DESIGN 9
4. BRE GUIDELINES FOR DAYLIGHT AND SUNLIGHT 11
5. DAYLIGHT LEVELS WITHIN THE PROPOSED DEVELOPMENT 12
6. SUNLIGHT ASSESSMENT TO AMENITY SPACES WITHIN THE DEVELOPMENT 28
7. SUNLIGHT ASSESSMENT WITHIN THE PROPOSED DEVELOPMENT (APSH) 29
8. ASSESSING THE IMPACT ON SURROUNDING PROPERTIES 31
9. OVERSHADOWING IMPACT TO SURROUNDING PROPERTIES 38
10. SUNLIGHT IMPACT TO SURROUNDING PROPERTIES (APSH) 40
11. CONCLUSION 41

APPENDIX A 43

1. INTRODUCTION

OCSC have been appointed to carry out a Daylight/ Sunlight study for the White Pines East development located in Dublin 16.

The aim of the study is to record and analyse the results for the following:

- The daylight levels within the living and bedroom areas of selected apartments, to give an indication of the expected daylight levels throughout the proposed development;
- The expected sunlight levels within the living areas and bedrooms within the proposed development;
- The quality of amenity space, being provided as part of the development, in relation to sunlight;
- Any potential daylight impact the proposed development may have on properties adjacent to the site.

The calculation methodology for daylight and sunlight is based on the British Research Establishments "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2011 Second Edition.

2. DEVELOPMENT DESCRIPTION

The development will consist of:

- The construction of 241 no. residential units, in 5 no. apartment blocks, ranging in height from 4-6 storeys, and 3 no. three storey duplex block. The development will provide 93 no. 1 Bed and 148 no. 2 bed units, as follows;
    - Block A is a 5 storey block comprising 40 units (20 no. 1 bed units; and 20 no. 2 bed units). Block A includes balconies on southern, northern and western elevations. A dedicated community building space comprising 552sq.m will also be provided on the ground floor of Block A.
    - Block B is a 4 storey block comprising 34 units (18 no. 1 bed units; and 16 no. 2 bed units). Block B includes balconies on southern, southern, western and eastern elevations;
    - Block C is a Part 4 Part 5 storey block comprising 43 units (21 no. 1 bed units; 22 no. 2 bed units) Block C includes balconies on southern, eastern and western elevations. Residential Tenant Amenities comprising c.171sq.m is provided at ground floor level of Block C to serve all residential units, comprising; a reception area, games space, residents lounge and gym space.
    - Block D is a 5 storey block comprising 49 no units (21 no. 1 bed units and 28 no. 2 bed units). Block D includes balconies on southern, western and eastern elevations;
    - Block E is a 6 storey block comprising 47 no units (13 no. 1 bed units and 34 no. 2 bed units). Block E includes balconies on southern, western, eastern and northern elevations;
    - 3 no. 3 storey duplex blocks are provided to the western boundary of the site, comprising 28 no. 2 bed units. Balconies and terrace space is provided to the eastern elevation.
- Provision of 204 no. on street car parking spaces
- Omission of crèche as approved under SDCC Ref. SD14A/0222;
- The main vehicular access to the scheme will be from Stocking Avenue. A second new vehicular access is proposed from White Pines North to the east.
- Provision of 401 no. bicycle parking spaces;
- All other ancillary site development works to facilitate construction, site services, piped infrastructure, ESB sub-stations, plant, public lighting, bin stores, bike stores, boundary treatments and provision of public and private open space including hard and soft landscaping, plant, provision of public and private open space areas comprising hard and soft landscaping, site services all other associated site excavation, infrastructural and site development works above and below ground.



Figure 1 - Proposed Site Plan

3. PROPOSED BUILDING DESIGN

In order to ensure that daylight levels were maximised for the White Pines East development, a number of key design strategies were analysed during concept design.

3.1. BUILDING MATERIAL SELECTION

The selection of materials play an important role in ambient daylight levels. The façade of the proposed development has been carefully selected to promote a sense of brightness and light and is composed of light materials. This will ensure light is reflected throughout the development. The inclusion of greenery to the amenity spaces will help to improve the sense of light and brightness within the apartments.



Figure 2 - Façade Views of Proposed Development

3.2. GLAZING TO WALL RATIO

The primary function of the glazing to wall ratio is to maximize daylight within the space while reducing solar gains within the proposed development. The other advantage in conjunction with appropriate materials is that the more light coloured, reflective materials used externally, the more ambient daylight will be reflected to the surrounding areas. In addition, floor to ceiling heights have been maximised to further enhance the opportunity for improved daylight levels. Extensive analysis was undertaken on all building facades to ensure glazing widths were maximized to promote access to daylight. The image below illustrates the glazing to wall ratio of the proposed development.



Figure 3 – Block D North Elevation Glazing to Wall Ratio

4. BRE GUIDELINES FOR DAYLIGHT AND SUNLIGHT

The analysis of the development's potential and the quality of amenity for the new development, as well as for the surrounding properties once the scheme has been implemented, has been based on the Building Research Establishment (BRE) guidelines on "Site Layout Planning for Daylight and Sunlight. A Guide to Good Practice (Building Research Establishment Report, 2011)."

These guidelines provide the criteria and methodology for calculations pertaining to daylight and sunlight, and is the primary reference for this matter. The guide gives simple rules for analysing sites where the geometry of the surroundings is straightforward, supplementing them with graphical methods for complex sites.

However, it is important to note that the performance targets which are included should be used with a degree of flexibility as per the extract below from the BRE Guideline:

"The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the designer. Although it gives numerical guidelines these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design."

The difficulty in achieving the result set out by the BRE guidance in a city centre location is also recognised within planning guidance which has been published by the Irish Government. On page 43 of the Urban Design Manual 2009 the following advice is provided:

"Where design standards are to be used (such as the UK document Site Layout Planning for Daylight and Sunlight, published by the BRE), it should be acknowledged that for higher density proposals in urban areas it may not be possible to achieve the specified criteria, and standards may need to be adjusted locally to recognise the need for appropriate heights or street widths."

5. DAYLIGHT LEVELS WITHIN THE PROPOSED DEVELOPMENT

5.1. ASSESSMENT CRITERIA – INTERNAL DAYLIGHT

The method of calculation selected for the internal daylight analysis for this development is the Average Daylight Factor (ADF). This is the most detailed and thus most accurate method which considers not only the amount of sky visible from the vertical face of the window, but also the window size, room size and room use.

Architectural plans and elevations provided by John Fleming Architects formed the basis for the internal daylight assessment.

In order to quantify the quality of daylight within a space as per BRE Guidelines, the British standards BS8206 sets out minimum daylight factors to be achieved in new build residential units.

Table 2 **Minimum average daylight factor**

Room type	Minimum average daylight factor %
Bedrooms	1
Living rooms	1.5
Kitchens	2

Where one room serves more than one purpose, the minimum average daylight factor should be that for the room type with the highest value. For example, in a space which combines a living room and a kitchen the minimum average daylight factor should be 2%.

Figure 4 - BS 8206 – Table 2

It should be noted that for this report, the target ADF value for the living spaces containing a kitchen has been set at 1.5%.

Targeting a minimum ADF of 2% in open space kitchen/living rooms, results in significant challenges while complying with the Design Standards for New Apartments, which are as follows:

- Amenity spaces: the guidance set out in the Design Standards for New Apartment document states that private amenity spaces shall be provided in the form of balconies at the upper levels. It is also stated that balconies are preferably accessed from living rooms. In order to achieve the 2% in living/ kitchen spaces balcony spaces would need to be removed at the lower floors.

- Floor to ceiling height: in order to achieve an ADF of 2%, the floor to ceiling heights would have to be increased on all levels which would have a planning height impact.
- Solar gains: with the removal of the balconies, increased floor to ceiling height and extensive glazing area there is a risk of overheating within the apartments.

With all of these factors considered, the use of an ADF of 1.5% is the most appropriate for the following reasons:

- Balcony amenity spaces can be provided in line with the Design Standards for New Apartments document.
- Floor to ceiling height are kept in line with Design Standards for New Apartments document.
- The proportion of glazing will still provide excellent daylighting and will avoid the risk of overheating due to balcony provision.

In order to analyse the ADF within the proposed residential development, simulations have been completed within the IES VE Software package. A detailed model of the development has been constructed using the software. The model includes the proposed development as well as the surrounding buildings adjacent to the site. Heights of surrounding buildings have been obtained from survey data.

5.2. DAYLIGHT RESULTS – INTERNAL DAYLIGHT APARTMENTS

This section outlines the apartment units that were selected for assessment of internal daylight levels for the proposed White Pines East development. The results of the analysis are outlined in the accompanying tables.

In line with standard industry practice, units presented at the lower levels have been selected as 'worst case' for analysis. The theory being that as floor level height increases so too does access to daylight. In addition, room depth and location of balconies also play an important role when it comes to daylight penetration within the room, therefore, a deep plan room with a balcony in front has been considered a 'worst case' unit. The units selected for analysis are considered to be representative of the units across the site and therefore results are indicative of daylight levels to be expected across the entire development.

In order to calculate a percentage of compliance across the proposed development, similar rooms within the same façade and same obstructions are known to present a similar ADF. Therefore, it is possible to apply this rationale across the full development and calculate a percentage of compliance based on a sample of rooms. Figure 5 illustrates an example of how this rationale is applied. The same colour rooms are expected to have a similar ADF.



Figure 5 – Rooms with similar ADF values

In order to illustrate how this rationale was applied for the White Pines East development, the figures outlining the room references also include a '✓' in the rooms assumed to achieve compliance and an '*X*' in those rooms expected to fall short in compliance.

If a room achieves compliance on a floor level, the unit above will present a higher value. As previously outlined, as floor level height increases so too does access to daylight. Therefore, if a room is showing compliance or a close value to compliance, similar rooms on the floor above are assumed to pass.

In summary, based on the above rationale, the vast majority of units not only meet but in the majority of cases exceed the Average Daylight Factor target set out. Of the 630 rooms that comprise the development, only 9 fall slightly under the BRE requirements, therefore a 98.6% compliance rate is achieved across the development.

In all cases generous floor to ceiling heights have been designed into the project with glazing areas being maximised to amplify the quality of daylight received. Careful consideration has been given to room layout design attributing store rooms and circulation areas to the back of rooms and living spaces to the front where the highest level of daylight is experienced.

The surface reflectance values outlined in Table 1 have been used in the analysis.

Surface Type	Reflectance (%)
External Wall	30
Internal Partitions	70
Ceiling	70
Floor	40
Adjacent Buildings	30
Glazing Transmittance	70

Table 1 – Surface Reflectance Values

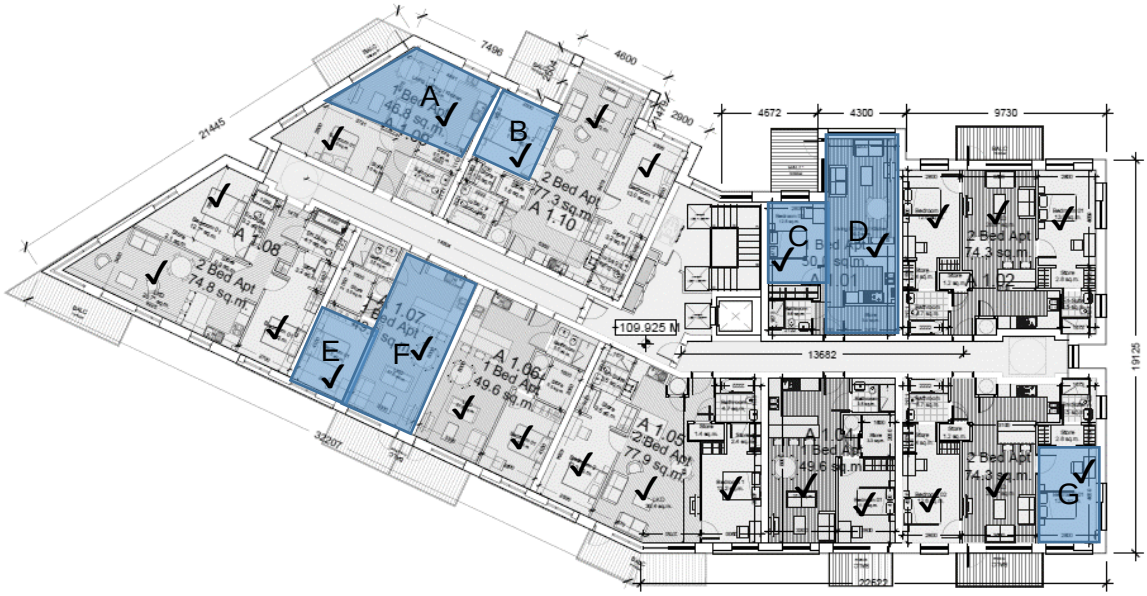


Figure 6 –Block A – First Floor Assessed Rooms Highlighted in Blue

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Living/ Kitchen	1.5%	3.7%	Y
B	Bedroom	1.0%	1.3%	Y
C	Bedroom	1.0%	1.2%	Y
D	Living/ Kitchen	1.5%	5.3%	Y
E	Bedroom	1.0%	2.7%	Y
F	Living/ Kitchen	1.5%	1.8%	Y
G	Bedroom	1.0%	4.5%	Y

Table 2 – Average Daylight Factor Results – Block A - First Floor Assessed Rooms

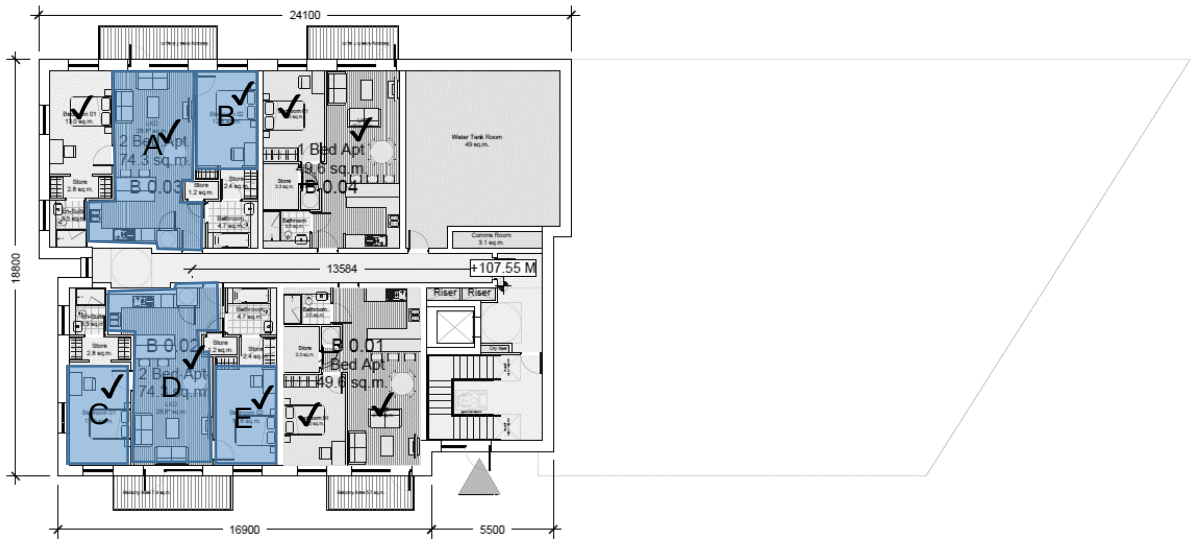


Figure 7 –Block B - Ground Floor Assessed Rooms Highlighted in Blue

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Living/ Kitchen	1.5%	2.7%	Y
B	Bedroom	1.0%	3.1%	Y
C	Bedroom	1.0%	4.7%	Y
D	Living/ Kitchen	1.5%	1.8%	Y
E	Bedroom	1.0%	2.1%	Y

Table 3 – Average Daylight Factor Results – Block B - Ground Floor Assessed Rooms



Figure 8 – Block B - First Floor Assessed Rooms Highlighted in Blue

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Bedroom	1.0%	3.7%	Y
B	Living/ Kitchen	1.5%	2.8%	Y
C	Living/ Kitchen	1.5%	1.9%	Y
D	Bedroom	1.0%	2.3%	Y
E	Bedroom	1.0%	2.6%	Y
F	Living/ Kitchen	1.5%	1.9%	Y

Table 4 – Average Daylight Factor Results – Block B - First Floor Assessed Rooms

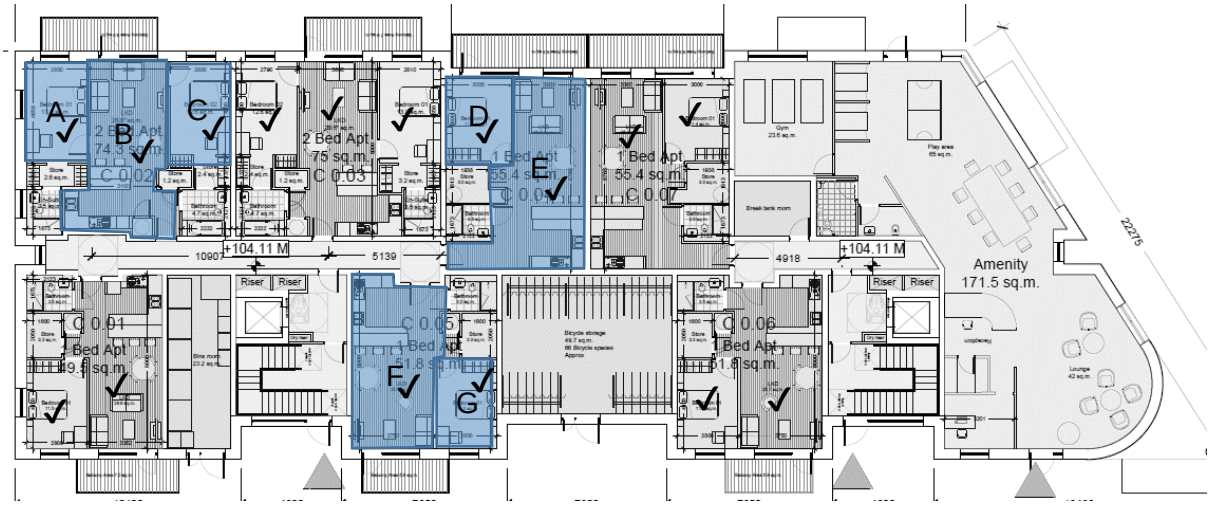


Figure 9 – Block C - Ground Floor Assessed Rooms Highlighted in Blue

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Bedroom	1.0%	2.7%	Y
B	Living/ Kitchen	1.5%	2.3%	Y
C	Bedroom	1.0%	3.0%	Y
D	Bedroom	1.0%	2.7%	Y
E	Living/ Kitchen	1.5%	2.2%	Y
F	Living/ Kitchen	1.5%	2.1%	Y
G	Bedroom	1.0%	3.3%	Y

Table 5 – Average Daylight Factor Results – Block C - Ground Floor Assessed Rooms

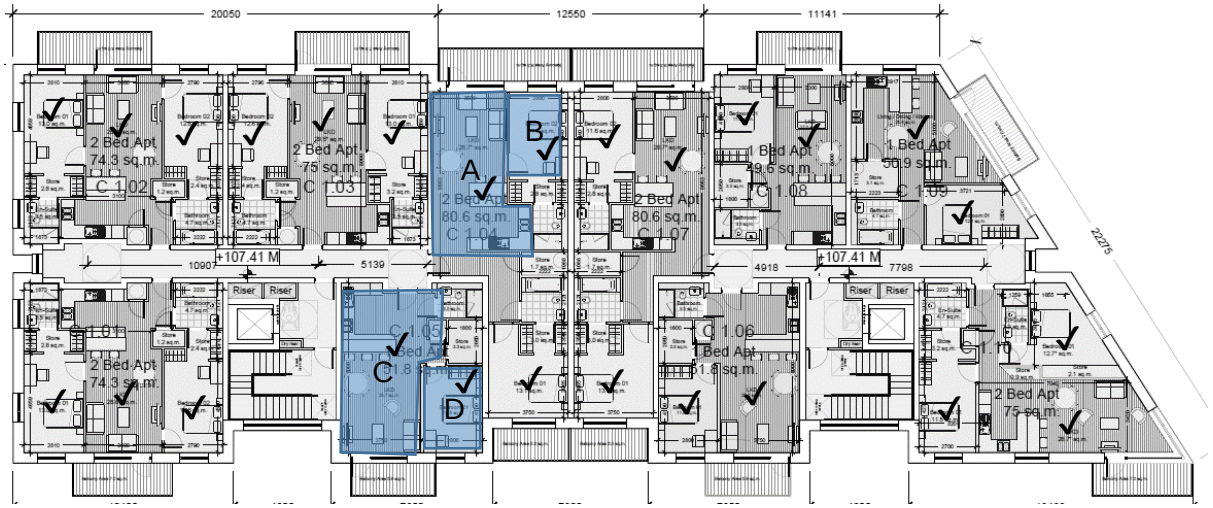


Figure 10 – Block C - First Floor Assessed Rooms Highlighted in Blue

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Living/ Kitchen	1.5%	2.3%	Y
B	Bedroom	1.0%	2.9%	Y
C	Living/ Kitchen	1.5%	2.2%	Y
D	Bedroom	1.0%	3.4%	Y

Table 6 – Average Daylight Factor Results – Block C - First Floor Assessed Rooms

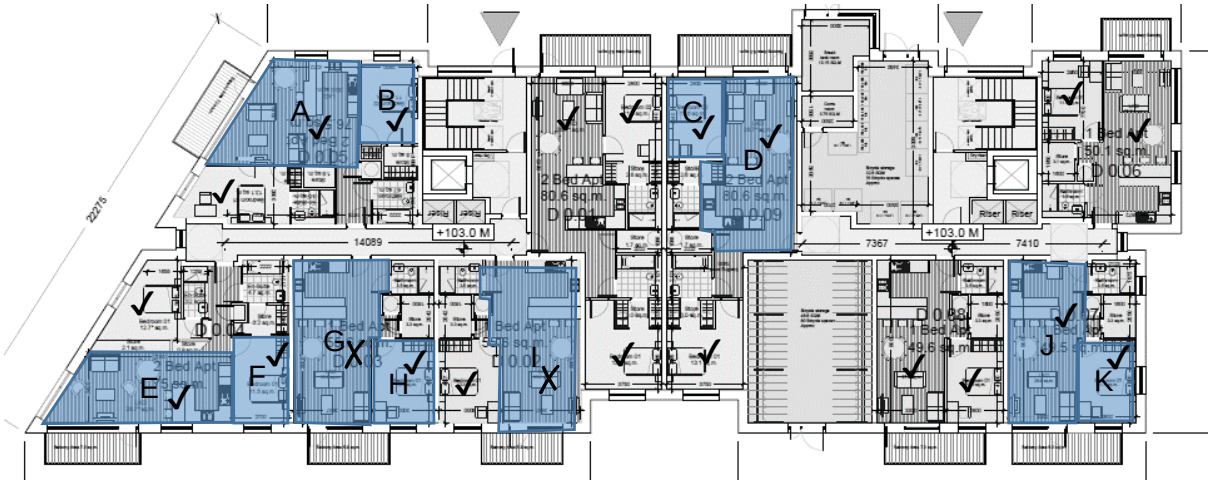


Figure 11 – Block D - Ground Floor Assessed Rooms Highlighted in Blue

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Living/ Kitchen	1.5%	4.1%	Y
B	Bedroom	1.0%	3.8%	Y
C	Bedroom	1.0%	2.8%	Y
D	Living/ Kitchen	1.5%	2.1%	Y
E	Living/ Kitchen	1.5%	5.2%	Y
F	Bedroom	1.0%	1.8%	Y
G	Living/ Kitchen	1.5%	1.2%	N
H	Bedroom	1.0%	2.0%	Y
I	Living/ Kitchen	1.5%	1.4%	N
J	Living/ Kitchen	1.5%	2.3%	Y
K	Bedroom	1.0%	5.0%	Y

Table 7 – Average Daylight Factor Results – Block D - Ground Floor Assessed Rooms



Figure 12 – Block D - First Floor Assessed Rooms Highlighted in Blue

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Living/ Kitchen	1.5%	2.2%	Y
B	Bedroom	1.0%	3.0%	Y
C	Living/ Kitchen	1.5%	1.3%	N
D	Bedroom	1.0%	2.1%	Y
E	Living/ Kitchen	1.5%	1.5%	Y

Table 8 – Average Daylight Factor Results – Block D - First Floor Assessed Rooms

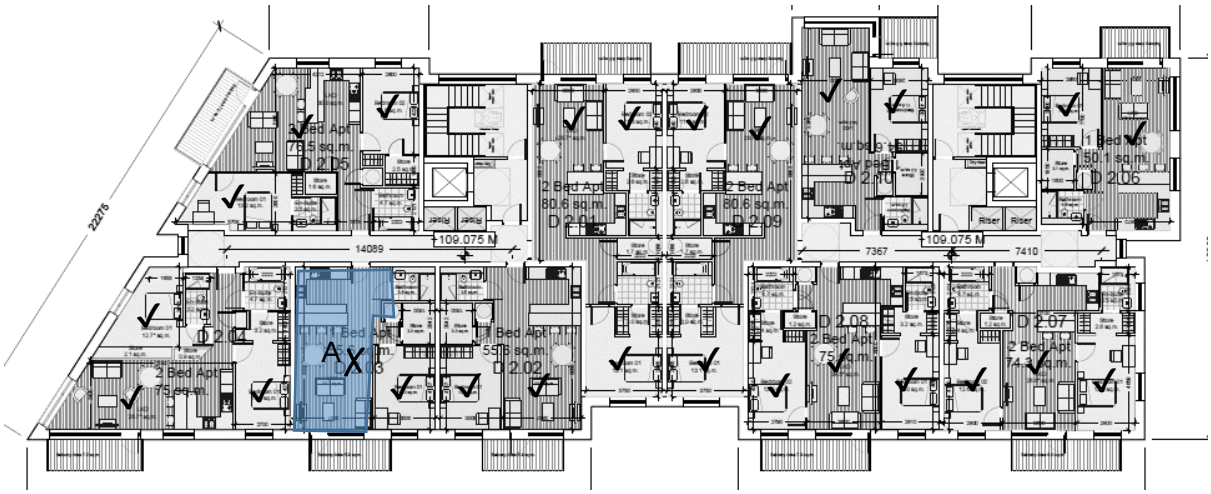


Figure 13 – Block D - Second Floor Assessed Rooms Highlighted in Blue

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Living/ Kitchen	1.5%	1.4%	N

Table 9 – Average Daylight Factor Results – Block D - Second Floor Assessed Rooms

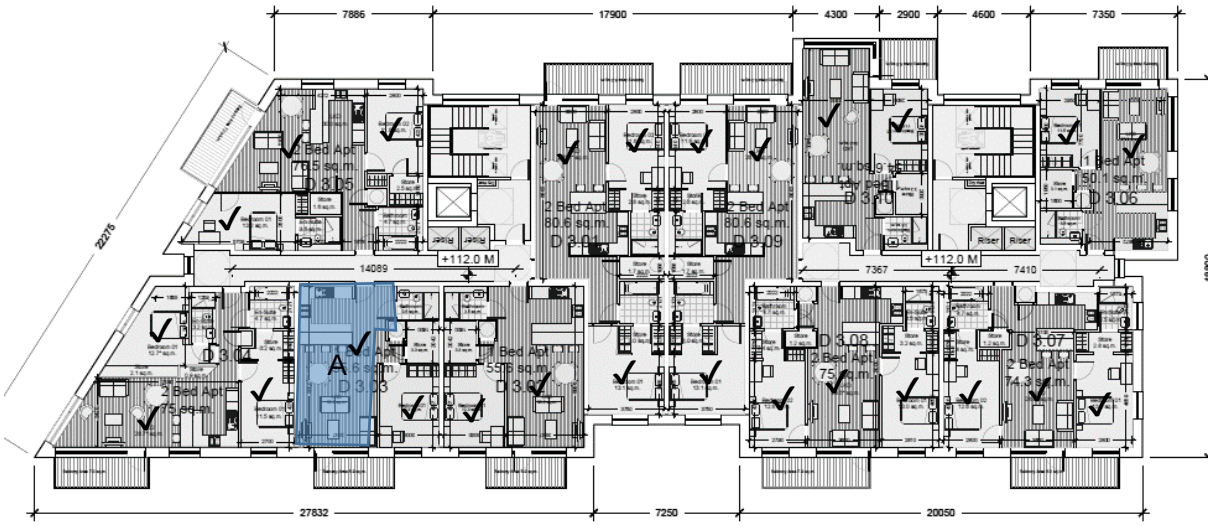


Figure 14 – Block D - Third Floor Assessed Rooms Highlighted in Blue

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Living/ Kitchen	1.5%	1.5%	Y

Table 10 – Average Daylight Factor Results – Block D - Third Floor Assessed Rooms



Figure 15 – Block E - Ground Floor Assessed Rooms

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Living/ Kitchen	1.5%	3.3%	Y
B	Bedroom	1.0%	2.7%	Y
C	Bedroom	1.0%	3.0%	Y
D	Living/ Kitchen	1.5%	2.2%	Y
E	Living/ Kitchen	1.5%	1.0%	N* (fails up to the 4th floor inclusive)
F	Bedroom	1.0%	2.2%	Y
G	Living/ Kitchen	1.5%	2.4%	Y

Table 11 – Average Daylight Factor Results – Block E - Ground Floor Assessed Rooms



Figure 16 – Block E - First Floor Assessed Rooms

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Bedroom	1.0%	5.0%	Y
B	Living/ Kitchen	1.5%	2.0%	Y
C	Living/ Kitchen	1.5%	2.3%	Y
D	Living/ Kitchen	1.5%	1.1%	N* (fails up to the 4th floor inclusive)
E	Bedroom	1.0%	2.3%	Y

Table 12 – Average Daylight Factor Results – Block E - First Floor Assessed Rooms

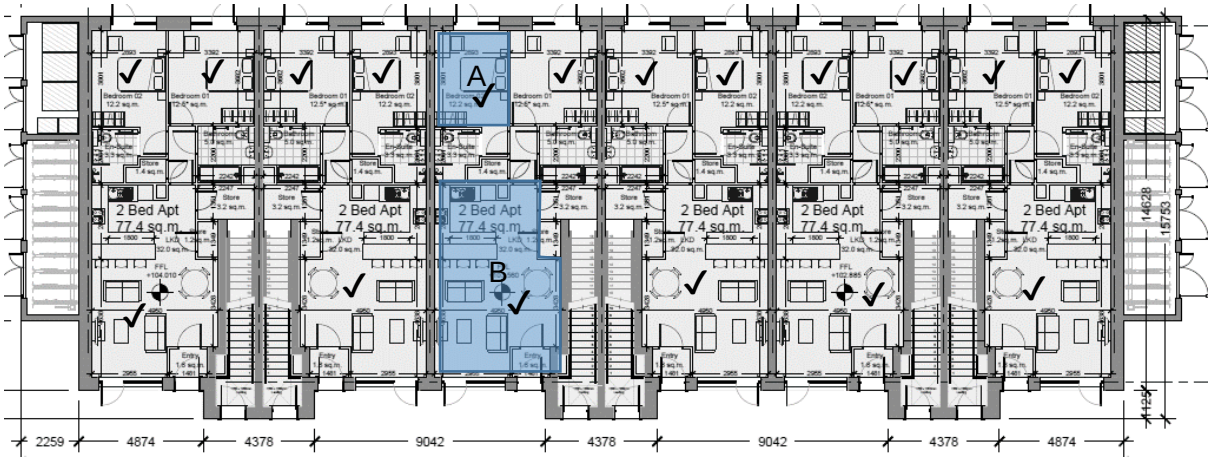


Figure 17 – Duplexes Ground Floor Assessed Rooms

	Unit	ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Bedroom	1.0%	4.0%	Y
B	Living/ Kitchen	1.5%	2.1%	Y

Table 13 – Average Daylight Factor Results – Duplexes Ground Floor Assessed Rooms

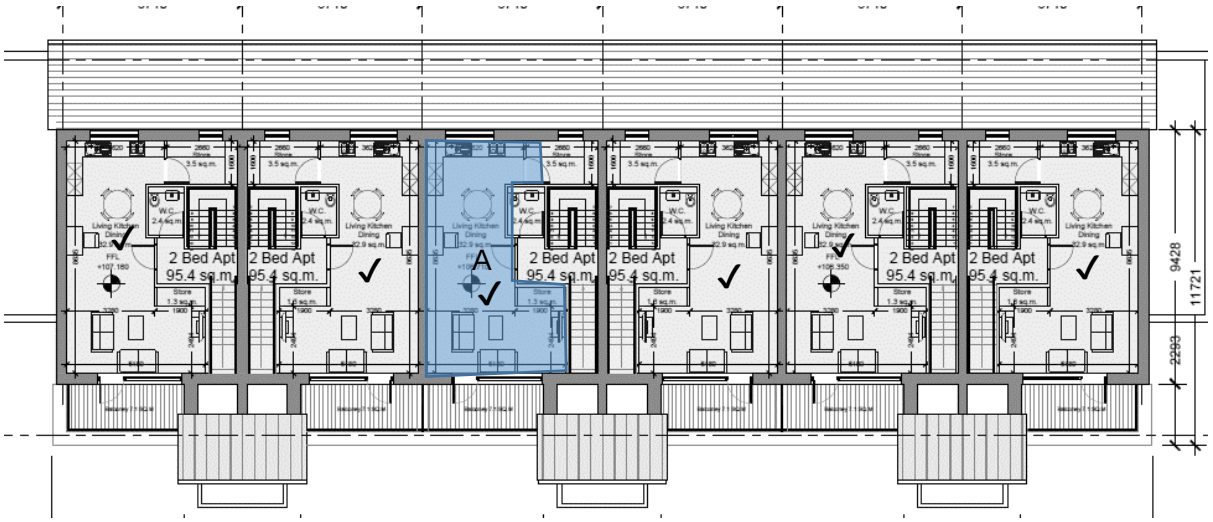


Figure 18 – Duplexes First Floor Assessed Rooms

	Unit	ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Living/ Kitchen	1.5%	4.5%	Y

Table 14 – Average Daylight Factor Results – Duplexes First Floor Assessed Rooms

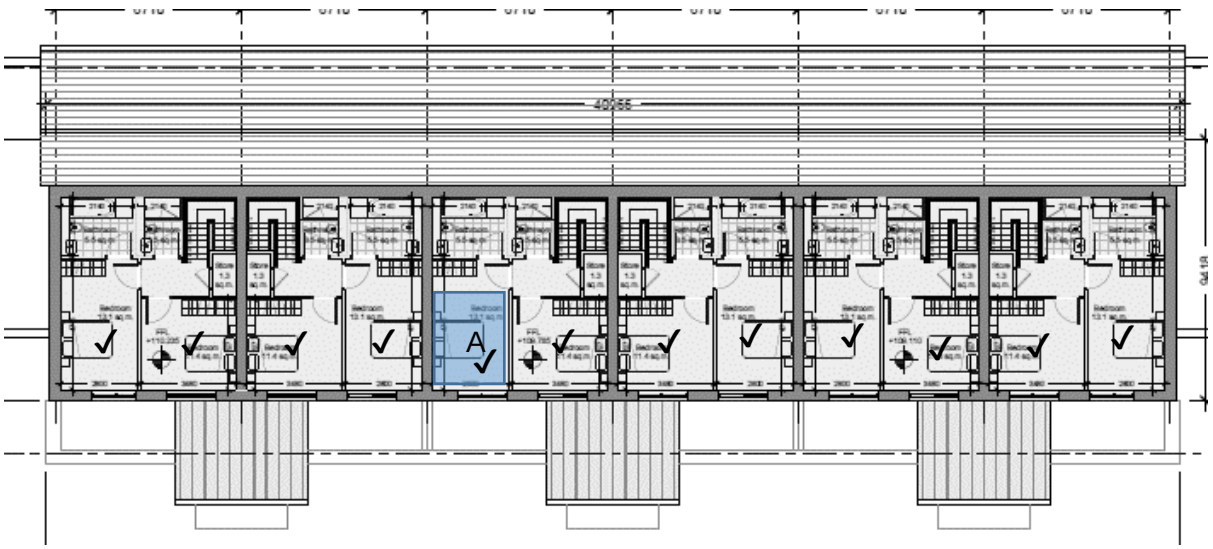


Figure 19 – Duplexes Second Floor Assessed Rooms

Unit		ADF target (%)	ADF results (%)	Meets minimum ADF target
A	Bedroom	1.0%	4.8%	Y

Table 15 – Average Daylight Factor Results – Duplexes Second Floor Assessed Rooms

6. SUNLIGHT ASSESSMENT TO AMENITY SPACES WITHIN THE DEVELOPMENT

BRE Guidelines (2011) recommend that for external amenity spaces to appear adequately sunlit throughout the year, at least half of the garden or amenity space should receive at least two hours of sunlight on March 21st.

In order to show that sunlight levels within the development achieve compliance with current BRE Guidelines a sunlight study has been carried out for the proposed development.

The red squares in Figure 20 highlight the areas that receive a minimum of 2 hours of sunlight on the 21st of March for the proposed development. The majority of the communal amenity spaces receive 2 hours or more of sunlight on March 21st, therefore compliance with BRE Guidelines is achieved.

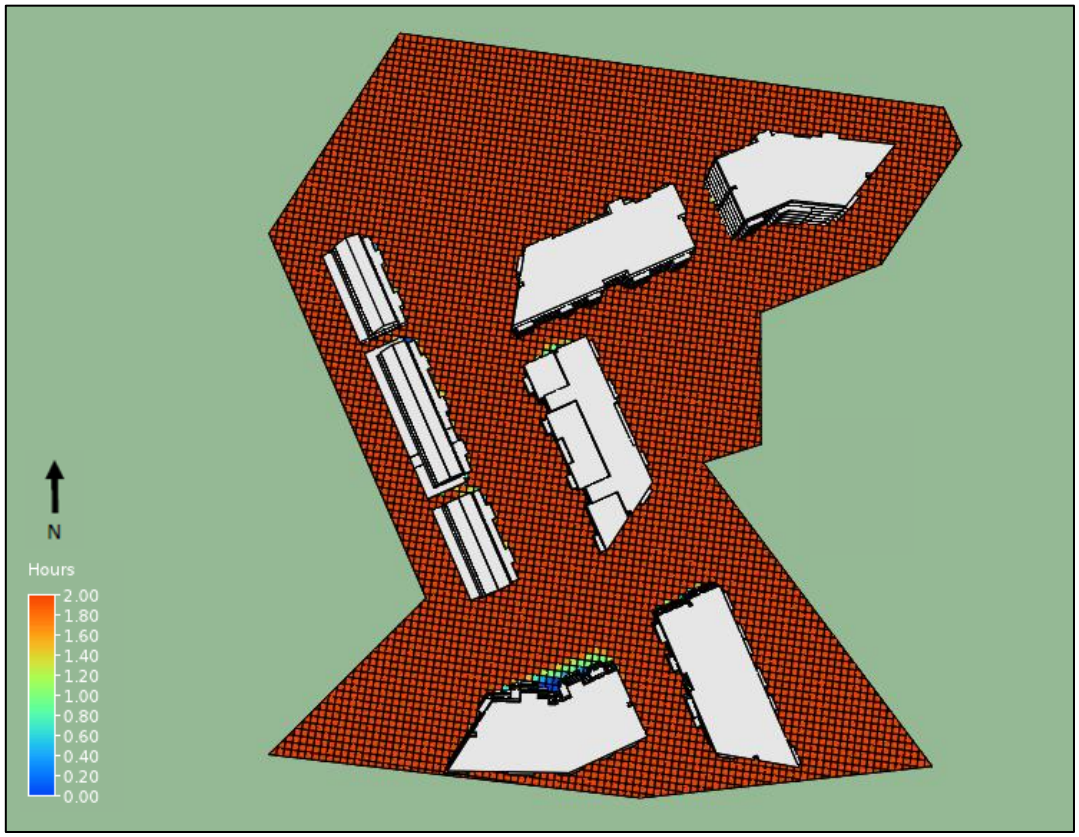


Figure 20 – Amenity Spaces - Hours of Sunlight on March 21st

The excellent daylight and sunlight access can also be attributed to the sunlight reflection from the building facades that have been carefully designed with light materials, thus creating comfortable and desirable spaces for the residents.

7. SUNLIGHT ASSESSMENT WITHIN THE PROPOSED DEVELOPMENT (APSH)

In order to determine the amount of sunlight that is received by windows within the proposed development, the Annual Probable Sunlight Hours (APSH) calculation method as outlined in BRE Guidelines has been used.

BRE Guidelines outline that in housing, the main requirement for sunlight is in living rooms, where it is valued at any time of the day but especially in the afternoon. BRE Guidelines also state that sunlight is less important in bedrooms and kitchens, however, all windows to occupied rooms within the development have been included within the analysis.

The recommendation set out in BRE Guidelines state that in order to show that adequate sunlight reaches windows within occupied rooms, the centre of at least one window to a main living room must receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours during the winter months between 21st September and 21st March.

While the BRE criteria sets out these recommendations for living room windows to receive direct sunlight throughout the year, the guidance set out in the Design Standards for New Apartments states that balconies should adjoin and have a functional relationship with the main living areas of the apartment. They also state that it is preferable that balconies would be primarily accessed from living rooms, which can reduce the sunlight being received in some instances.

As the location of balconies have been designed to primarily comply with the apartment design guidelines, the amount of sunlight reaching these living room windows at lower floors will naturally be reduced and achieving the recommended values within BRE Guidelines can become challenging. Therefore, in addition to assessing the criteria recommended in the BRE Guidelines, a relaxed value has been set to give further reference in relation to sunlight levels.

The below table summarises the annual probable sunlight hours for the annual period and for the winter period based on the BRE recommendations. Two additional checks with relaxed benchmarks have been carried out to show the majority of windows still achieve good levels of sunlight across the development.

	BRE Guidelines Check 1 **APSH > 25%** **Annual Period**	**BRE Guidelines Check 2** **APSH > 5%** **Winter Period**	**Additional Check 1** **APSH > 20%** **Annual Period**	**Additional Check 2** **APSH > 15%** **Annual Period**
Percentage of Compliance	69%	73%	75%	83%

Table 16 – APSH Summary Table

The results from the analysis have shown that for the annual period, 69% of the analysed windows achieve the recommended APSH values stated in the BRE Guidelines, while 73% of windows achieve the recommended values during the winter months, when sunlight is more valuable. When a relaxed benchmark of 20% and 15% is applied, 75% and 83% of the analysed windows achieve this alternative value, showing that acceptable levels of sunlight will be achieved across the development. The shortfall in compliance can be attributed to the projection of balconies over the lower levels rooms and to the north facing facades.

It must be noted that the results within this report should be treated with certain degree of flexibility, based on the following statement in the BRE Guidelines:

"the guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design".

In addition, BS8206 states that *"the degree of satisfaction is related to the expectation of sunlight. If a room is necessarily north facing or if the building is in a densely-built urban area, the absence of sunlight is more acceptable than when its exclusion seems arbitrary".*

The images in Appendix A illustrate the sunlight levels achieved within the development.

8. ASSESSING THE IMPACT ON SURROUNDING PROPERTIES

8.1. DAYLIGHT IMPACT METHODOLOGY

As per the BRE Guidelines, it is important to safeguard the daylight to nearby buildings, from a proposed development, where a reasonable expectation of daylight is required. The flow matrix below outlines the criteria to be assessed, as per the BRE Guidelines, in order to ascertain any potential impact to adjacent buildings from the proposed development.

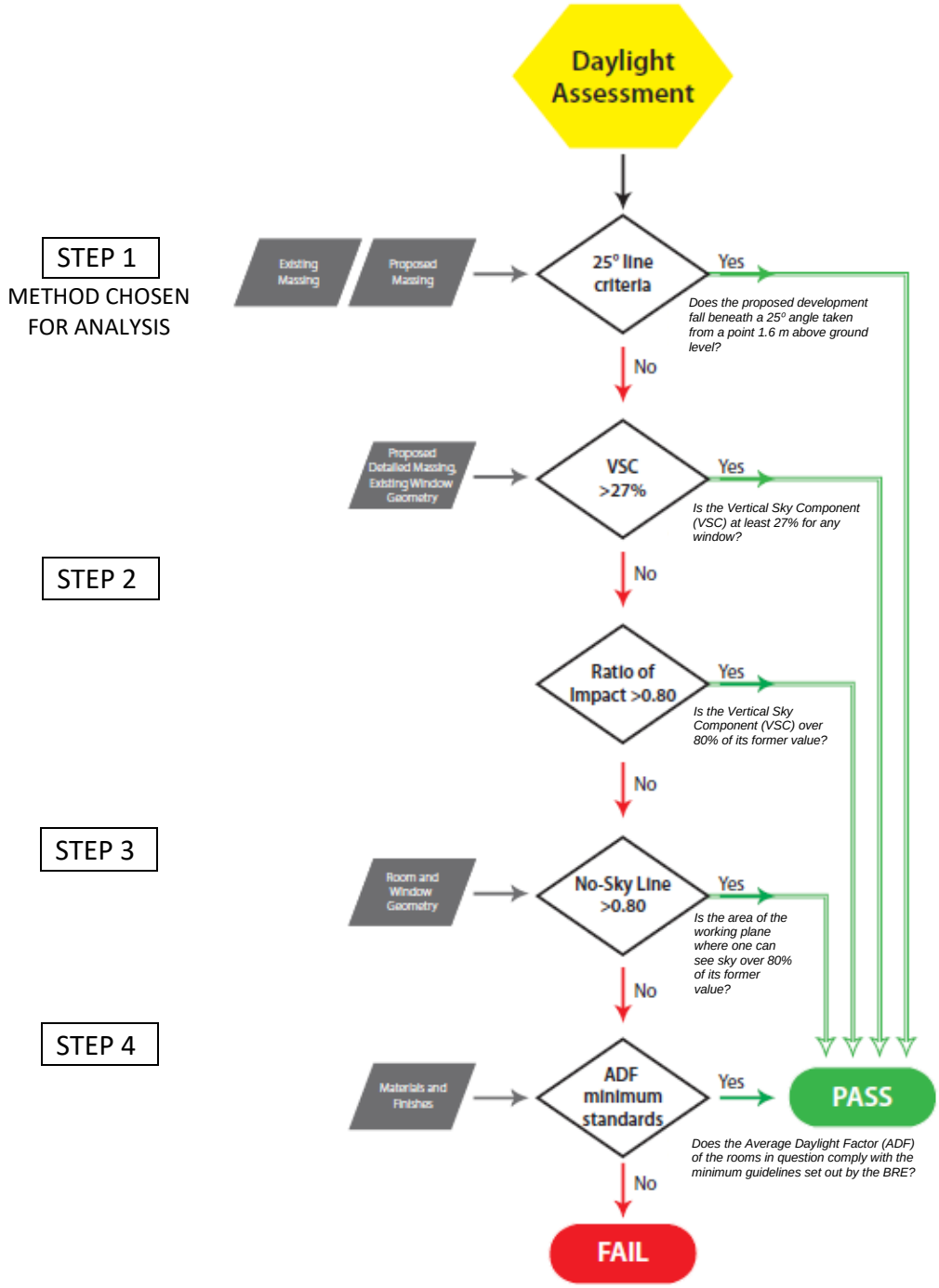


Figure 21 – Daylight Assessment Methodology

As per the flow matrix, the BRE and BS8206 guidelines provide four main methods for assessing daylight availability. In order to assess the impact of the proposed White Pines East development to surrounding buildings, the 25° line was selected as the method of analysis.

8.1.1 25° LINE CRITERIA

In the first instance, if a proposed development falls beneath a 25° angle taken from a point 1.6 metres above ground level from any adjacent properties, then the BRE Guidelines say that no further analysis is required in relation to impact on surrounding properties as adequate skylight will still be available. In the case of the White Pines East development, this method was successful, showing that all adjacent properties are located a substantial distance from the proposed development, therefore, no further analysis was required.

8.1.2 VERTICAL SKY COMPONENT

The second method is known as the Vertical Sky Component (VSC). The VSC calculation is the ratio of the direct sky illuminance falling on the outside of a window, to the simultaneous horizontal illuminance under an unobstructed sky. The BRE Guide sets out two guidelines for the VSC analysis:

- If the VSC at the centre of the existing window exceeds 27% with the new development in place, then enough sky light should still be reaching the existing window.
- If the VSC with the new development in place is both less than 27% and less than 80% its former value, then the reduction in light to the window is likely to be noticeable.
- This means that even if the VSC is less than 27%, as long as the VSC value is still greater than 80% of its former value, this would be acceptable and thus the impact would be considered negligible.

It is important to note that the VSC is a simple geometrical calculation which provides an early indication of the potential for daylight entering the space. However, it does not assess or quantify the actual daylight levels inside the rooms. If the VSC standard is not met on any window, a more detailed assessment based on the Average Daylight Factor should be undertaken.
Since the first step (25°line) has shown compliance, this method of assessment was not required.

8.1.3 NO SKY LINE

The third method is the No Sky Line or Daylight Distribution Method. This method assesses the change in position of the No Sky Line between the existing and proposed situations. It does take into account the number and size of windows to a room, but still does not give any qualitative or quantitative assessment of the light in the room, only where sky can or cannot be seen. Thus, as this method is limited, it was not used as part of the analysis.

8.1.4 AVERAGE DAYLIGHT FACTOR

The final method of calculation is the Average Daylight Factor (ADF). This is a more detailed and thus more accurate method which considers not only the amount of sky visible from the vertical face of the window, but also the window size, room size and room use. Where dimensions for the room to be assessed are available, this is the best method of assessment, but even where they are not, it provides a very informative result. It gives guidance as to the qualitative and quantitative change in daylight and is related to the British Standard BS 8206 Part II.

This step is only utilised for assessing the impact to adjacent properties where compliance is not achieved using the VSC analysis. As the 25° line method showed compliance, this step was not used as part of the analysis.

Sections 8.2 and 8.3 on the following pages outline the details of the analysis undertaken.

8.2. IDENTIFYING SENSITIVE RECEPTORS

Prior to following the flow matrix, first the key sensitive receptors around the site need to be identified. According to the BRE Guidelines, sensitive receptors are described as:

- Habitable rooms in residential buildings, where the occupants have a reasonable expectation of daylight;
- Other sensitive receptors are gardens and open spaces on adjacent properties to the new scheme, excluding public footpaths, front gardens and car parks. In accordance with the BRE Guide, windows are selected as sensitive receptors on the basis of being a habitable room facing the proposed development.

Similarly, amenities and open spaces are selected on the basis of being in the immediate vicinity of the proposed development. The primary purpose of a daylight, sunlight and overshadowing assessment is to determine the likely loss of light to adjacent buildings resulting from the construction of the proposed development.

Therefore, in this case, the proposed development is identified as the potential source of impact. The sensitive receptors identified for this study are windows of habitable rooms facing the site where the occupants have a reasonable expectation of daylight. Table 17 identifies all sensitive receptors analysed, whilst Figure 22 identifies their location.

Development name
The Green Acres House
White Pines North

Table 17 – Sensitive Receptors surrounding White Pines East development

The image below identifies the location of the sensitive receptors located in closest proximity to the proposed site.



Figure 22 - Location of Sensitive Receptors

8.3. DAYLIGHT IMPACT ON SURROUNDING PROPERTIES

25° line

BRE Guidelines state that if a proposed development falls beneath a 25° line taken from a point 1.6 metres above ground level from any adjacent properties, then no impact is perceived and further analysis is not required.

The image below highlights in red the 25° line created. All adjacent properties fall outside the 25° line therefore, no further analysis is required.



Figure 23 - 25° Line Criteria

Even though all adjacent properties fall outside the 25° line, since the properties located to the East are in close proximity to the 25° line, a VSC check was carried out to ensure that daylight impact was not perceived.

Vertical Sky Component

BRE Guidelines state that if the VSC is ≥ 27% with the new development in place, then enough sky light should still be reaching the existing window. If the VSC value is under 27%, in order for the window to perceive a negligible impact, the VSC with the proposed development in place should still be ≥80% of its former value.

As previously outlined, all adjacent properties fall outside the 25° line, therefore negligible daylight impact will be perceived. However, since the properties to the East are in close proximity to the 25° line, a VSC analysis was carried out to confirm that negligible impact is perceived. In order to analyse the VSC levels within the selected adjacent properties, 'worst case' windows located at lower level were modelled for each house being analysed. In all cases, the VSC results achieved for the adjacent properties is well in excess of 27%, with VSC results of around 33%. Therefore, excellent levels of daylight will still be perceived once the proposed development is constructed.

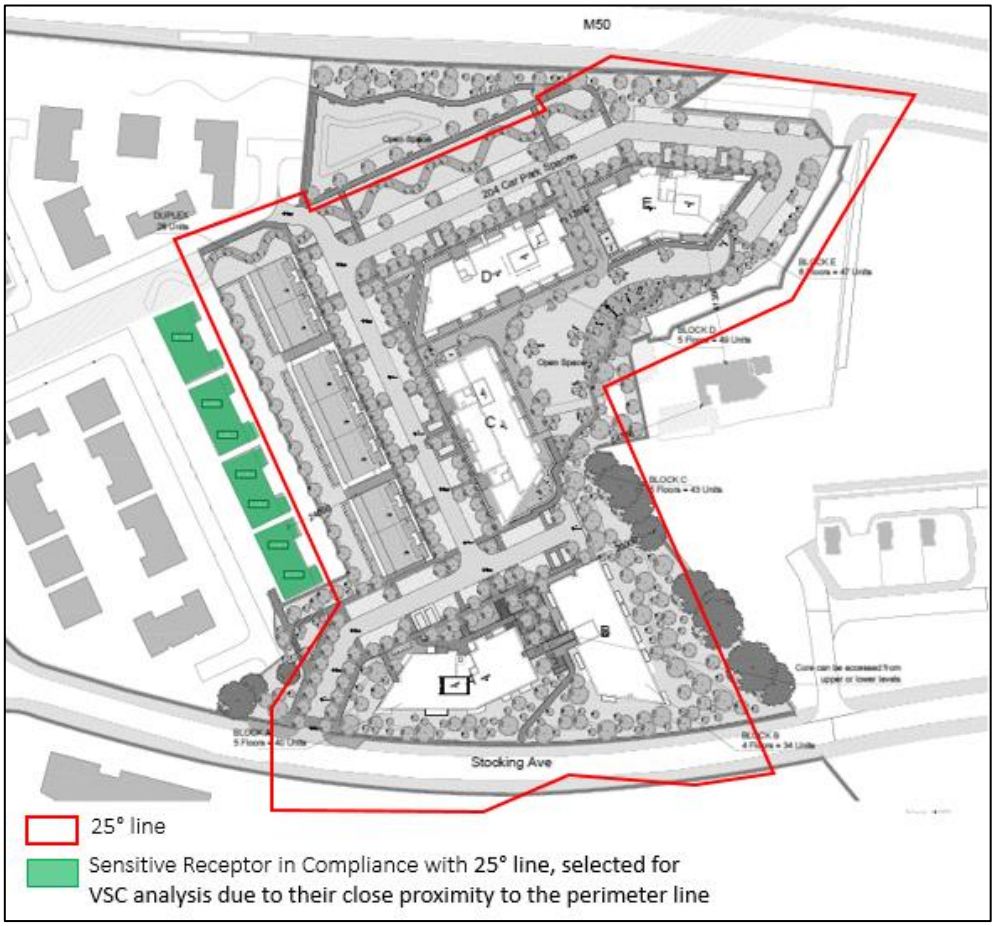


Figure 24 - 25° Line Criteria and VSC properties

9. OVERSHADOWING IMPACT TO SURROUNDING PROPERTIES

The overshadowing impact from the proposed development on surrounding buildings has been analysed for the proposed development. The overshadowing images illustrate the overshadowing impact on March 21st from 10 a.m. to 5 p.m.. Overshadowing images for June 21st and December 21st are illustrated in Appendix B.

The only adjacent property that would receive a minimal sunlight impact is the Green Acres House, however, the impact will be perceivable after 5 p.m. on March 21st. Due to the location of the Green Acres House garden and the only perceivable impact from the proposed development being after 5 p.m., no further analysis was required. It can be stated that no further overshadowing to any of the sensitive receptors will be perceived and all receptors will still receive excellent levels of sunlight once the proposed development is constructed.

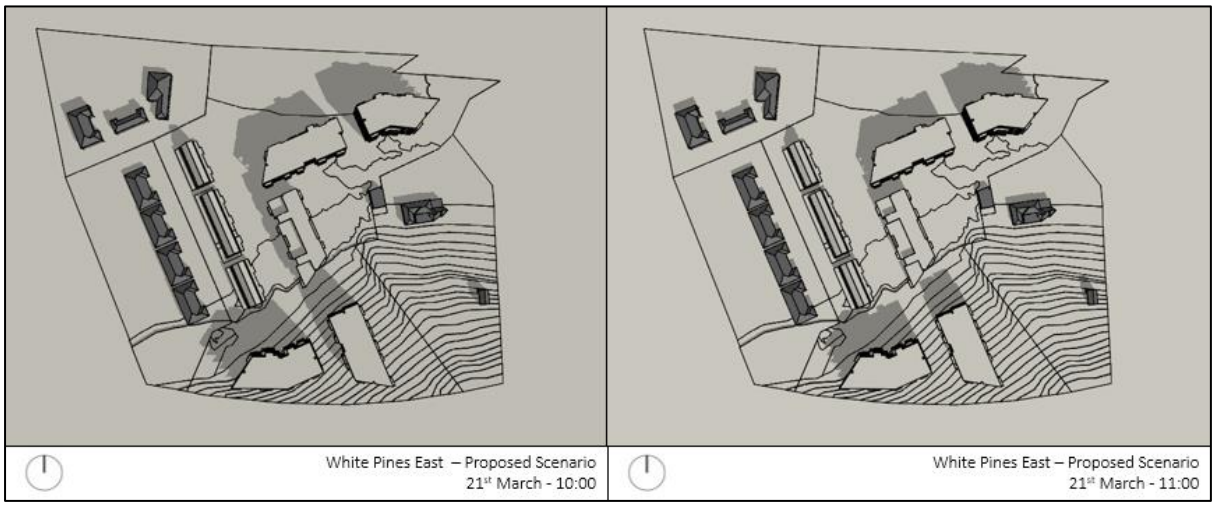


Figure 25 – Overshadowing Image on March 21st at 10 a.m. and 11 a.m.

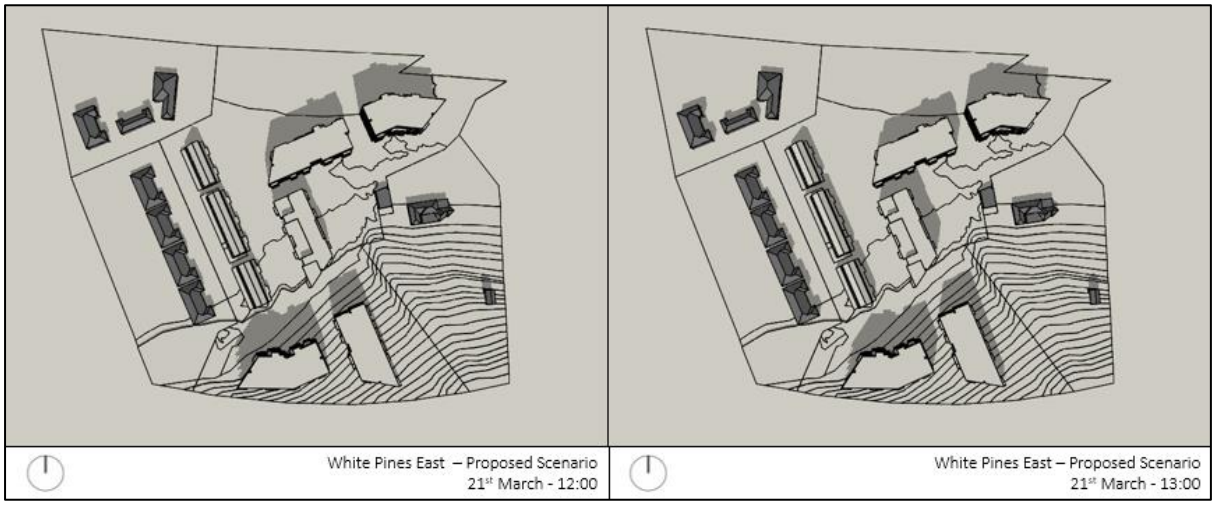


Figure 26 – Overshadowing Image on March 21st at 12 p.m. and 1 p.m.

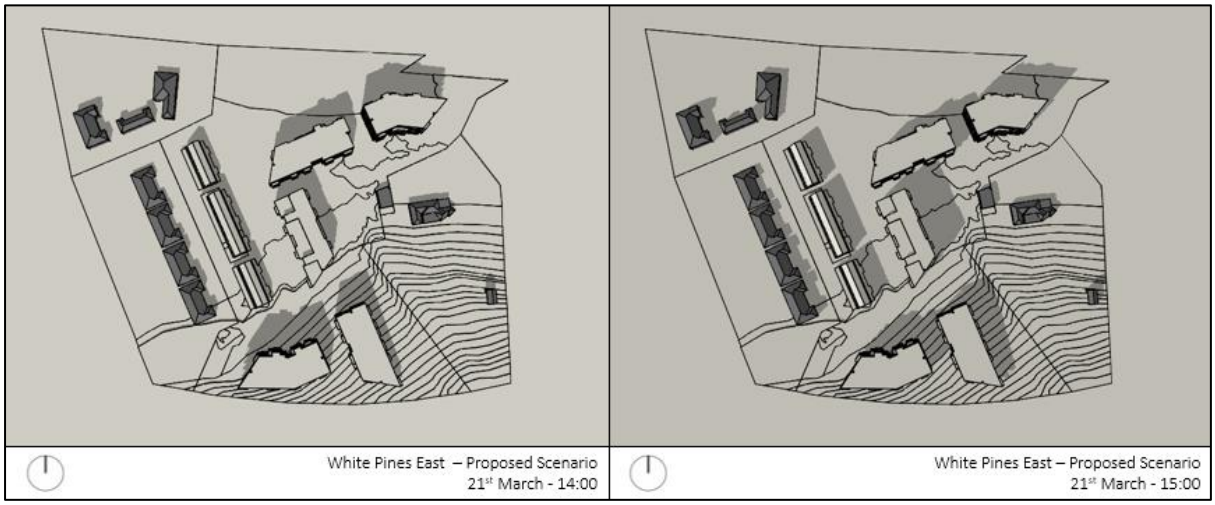


Figure 27 – Overshadowing Image on March 21st at 2 p.m. and 3 p.m.

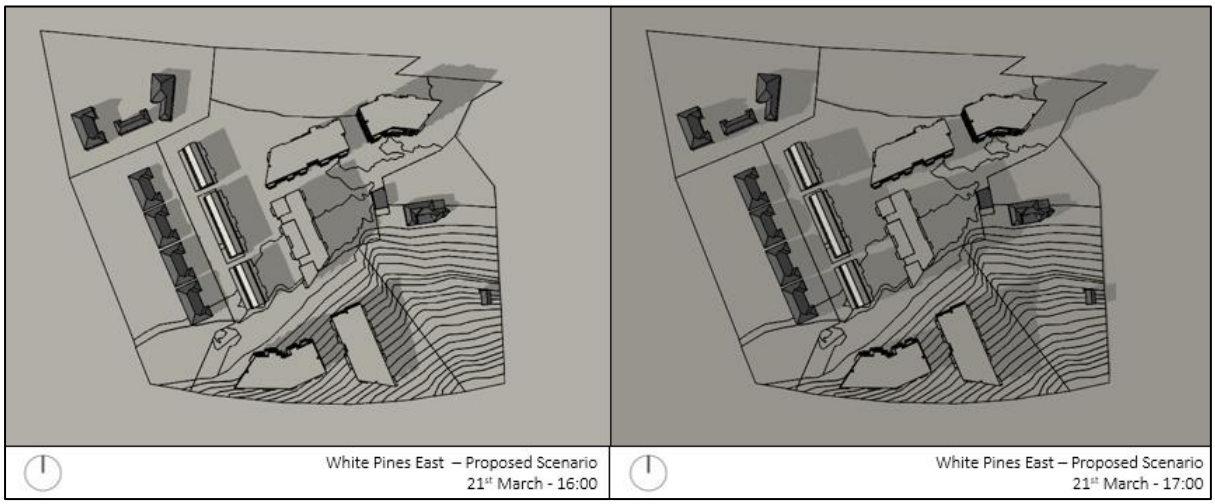


Figure 28 – Overshadowing Image on March 21st at 4 p.m. and 5 p.m.

10. SUNLIGHT IMPACT TO SURROUNDING PROPERTIES (APSH)

In order to analyse the sunlight access within the adjacent properties to the White Pines East development, the Annual Probable Sunlight Hours (APSH) is the method used for this assessment.

BRE Guidelines outline that if a living room of an existing dwelling has a main window facing within 90° of due south, and any part of a new development subtends an angle of more than 25° to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sunlight of the existing dwelling may be adversely affected (refer to Figure 29).

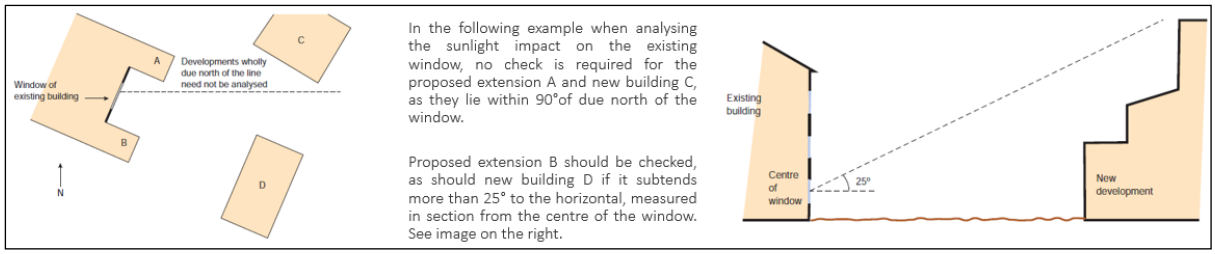


Figure 29 – BRE Extract of the methodology for rooms selection - APSH

The sunlight within adjacent properties may be adversely affected if the center of the window:

- Receives less than 25% of annual probable sunlight hours, or less than 5% of annual probable sunlight hours between September 21st and March 21st
- Receives less than 80% of its former sunlight hours during either period
- Has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours

As illustrated in Figure 23, all adjacent properties fall outside the 25° line. Therefore, all adjacent properties are a substantial distance from the proposed development and no analysis is required as there will be negligible impact due to the proposed development.

11. CONCLUSION

The proposed White Pines East development has been analysed in order to determine the following:

- The daylight levels within the living and bedroom areas of selected apartments, to give an indication of the expected daylight levels throughout the proposed development;
- The expected sunlight levels within the living areas and bedrooms of the proposed development;
- The quality of amenity spaces, being provided as part of the development, in relation to sunlight;
- Any potential overshadowing impact the proposed development may have on properties adjacent to the site.

Calculations and methodology used are in accordance with BRE Guidelines for daylight and sunlight and based on the British Research Establishments "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2011 Second Edition, however, the following should be reiterated as previously outlined:

"The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather that constrain the designer. Although it gives numeral guidelines these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design"

The calculation methodology for daylight and sunlight is based on the British Research Establishments "Site Layout Planning for Daylight and Sunlight: A Good Practice Guide" by PJ Littlefair, 2011 Second Edition.

Internal Daylight

The analysis confirms that across the entire development excellent levels of internal daylight are achieved. A 98.6% compliance rate is achieved across the entire development.

Throughout the full development, comfortable and desirable spaces have been designed with floor to ceiling heights maximised to further enhance the opportunity for improved daylight levels and

extensive glazing to every room enabling deep daylight penetration and providing enhanced views to a beautiful landscaped area.

Sunlight

Sunlight analysis has shown that excellent levels of sunlight will be achieved within the proposed development. At least 2 hours of sunlight are achieved on March 21st on the majority of the amenity spaces provided, thus complying with BRE Guidelines.

The annual probable sunlight hours assessment has shown that even though some windows are slightly under the BRE recommendations, good levels of sunlight will still be achieved within the proposed development. The shortfall in achieving the BRE recommendations is marginal in the majority of cases and can be attributed to the location of these windows in low levels and with a north orientation. Also, the location of balconies to living rooms, which have been designed in line with the Design Standards for New Apartments documents, will naturally reduce the amount of sunlight to those windows but will provide the occupant with an amenity space that will receive excellent levels of sunlight.

Impact to surrounding properties

The 25° line and APSH analysis have demonstrated that the proposed building has negligible daylight and sunlight impact to adjacent properties.

The shadow analysis confirms that the only adjacent property that would be impacted is the Green Acres House, however, the impact will be perceivable after 4 p.m. on March 21st. Therefore, it can be stated that no further overshadowing to any of the sensitive receptors will be perceived and they will still receive excellent levels of sunlight once the proposed development is constructed.

In conclusion, the steps taken by the project team during design have ensured that levels of daylight and sunlight within the development have been safeguarded and the impact to adjacent properties is negligible.

APPENDIX A

The following images illustrate in orange the windows that achieve the recommended values within the BRE Guidelines and in blue the windows that fall marginally under the recommended values for the annual period as outlined in the BRE Guidelines.

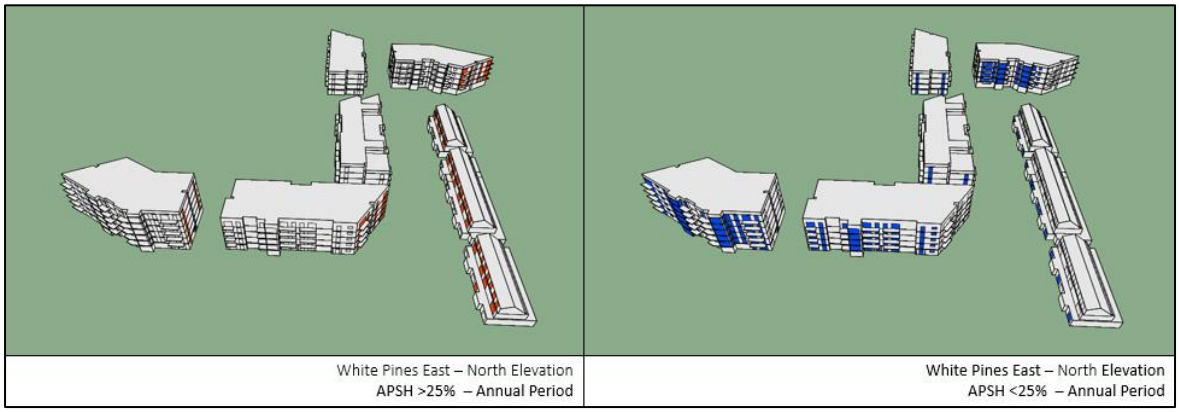


Figure A.1 – APSH Annual Period (BRE Recommended Benchmark) – North Elevation

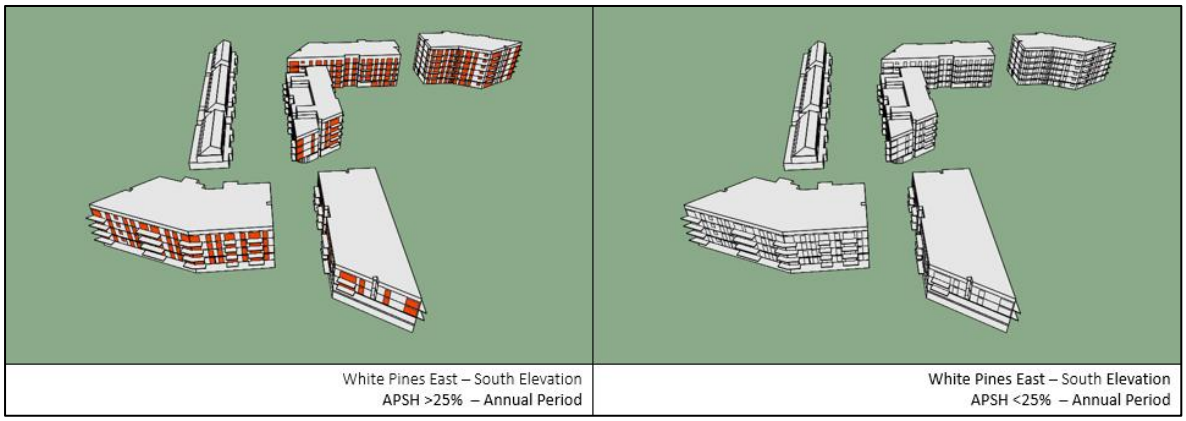


Figure A.2– APSH Annual Period (BRE Recommended Benchmark) – South Elevation

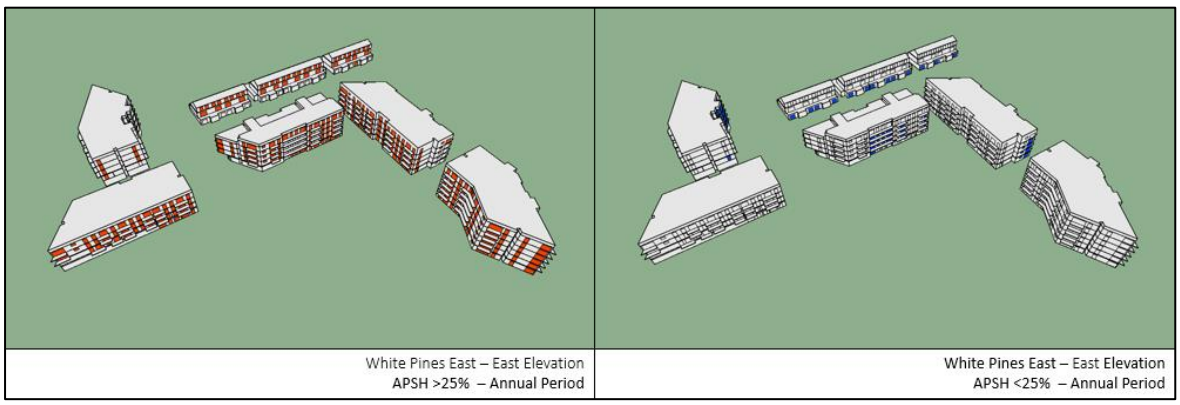


Figure A.3 – APSH Annual Period (BRE Recommended Benchmark) – East Elevation

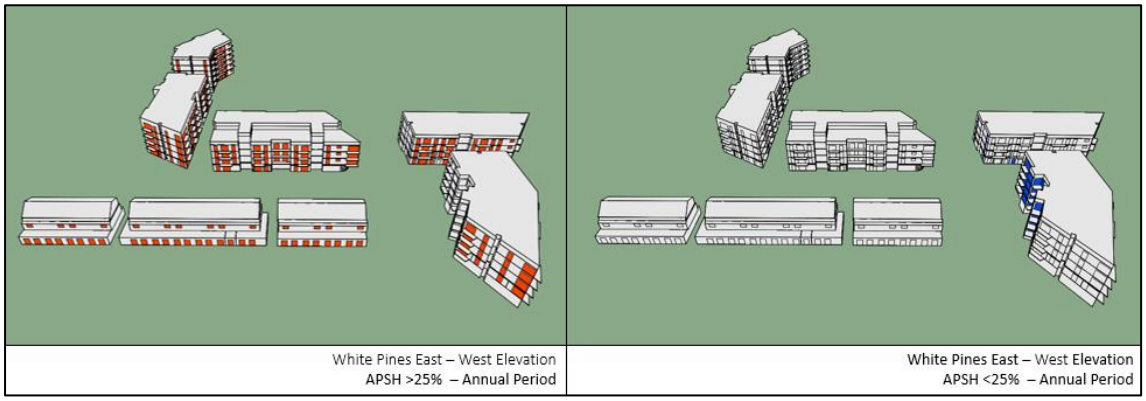


Figure A.4 – APSH Annual Period (BRE Recommended Benchmark) – West Elevation

In addition, the following images illustrate in orange the windows that achieve the relaxed benchmark of 15% and in blue the windows that are under 15% of APSH for the annual period. It is evident the majority of windows achieve the relaxed benchmark. The only windows falling under the 15% benchmark are those on the north elevation. This is normal due to their orientation. As outlined in the BRE Guidelines, north facing windows will only receive sunlight on a handful of occasions.

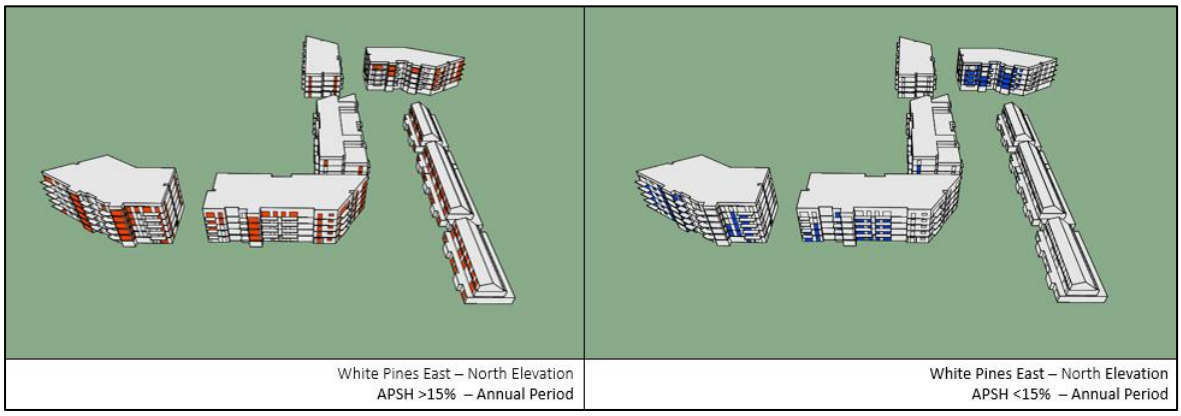


Figure A.5 – APSH Annual Period (Relaxed Benchmark) – North Elevation

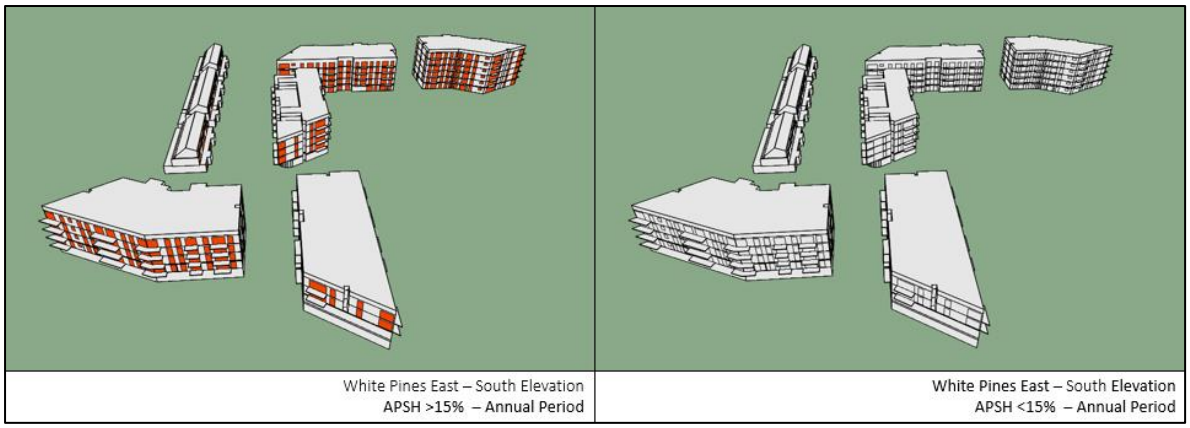
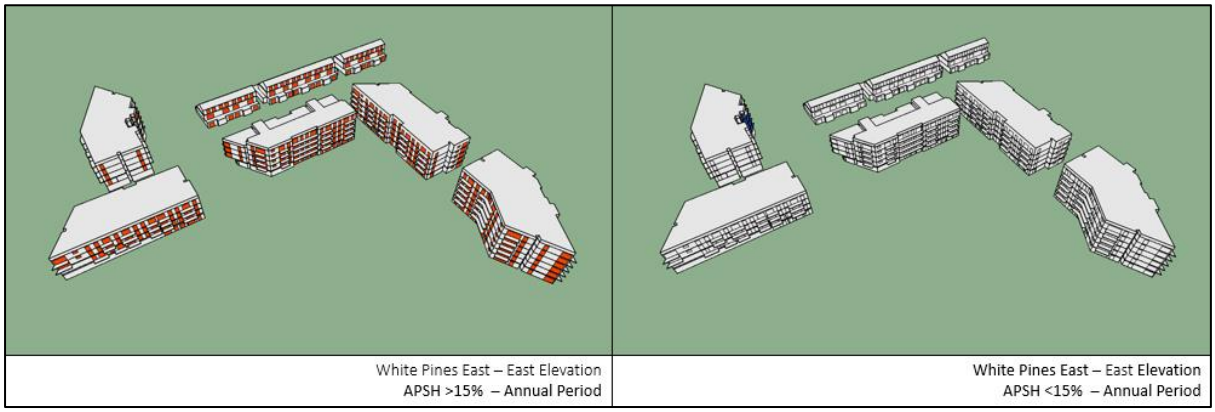


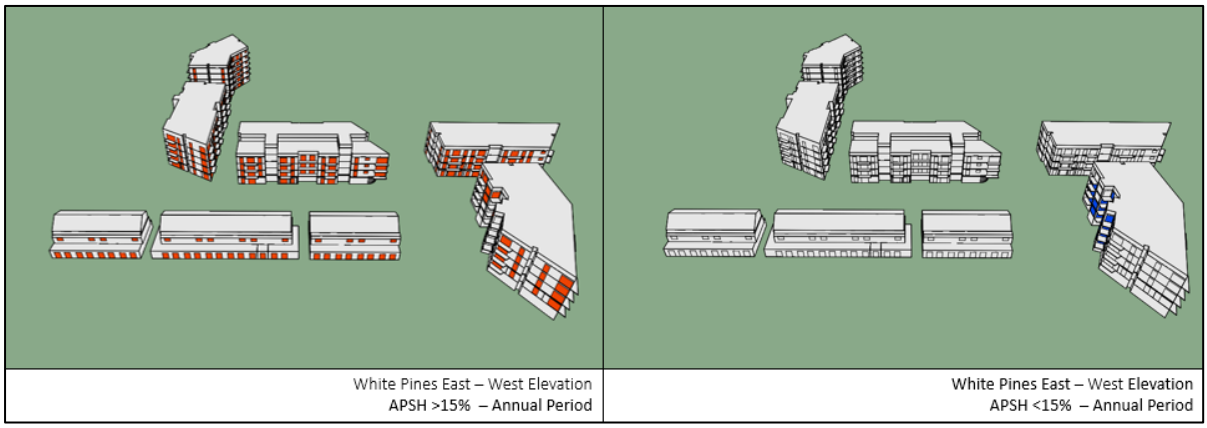
Figure A.6 – APSH Annual Period (Relaxed Benchmark) – South Elevation



White Pines East – East Elevation
APSH >15% – Annual Period

White Pines East – East Elevation
APSH <15% – Annual Period

Figure A.7 – APSH Annual Period (Relaxed Benchmark) – East Elevation



White Pines East – West Elevation
APSH >15% – Annual Period

White Pines East – West Elevation
APSH <15% – Annual Period

Figure A.8 – APSH Annual Period (Relaxed Benchmark) – West Elevation

APPENDIX B

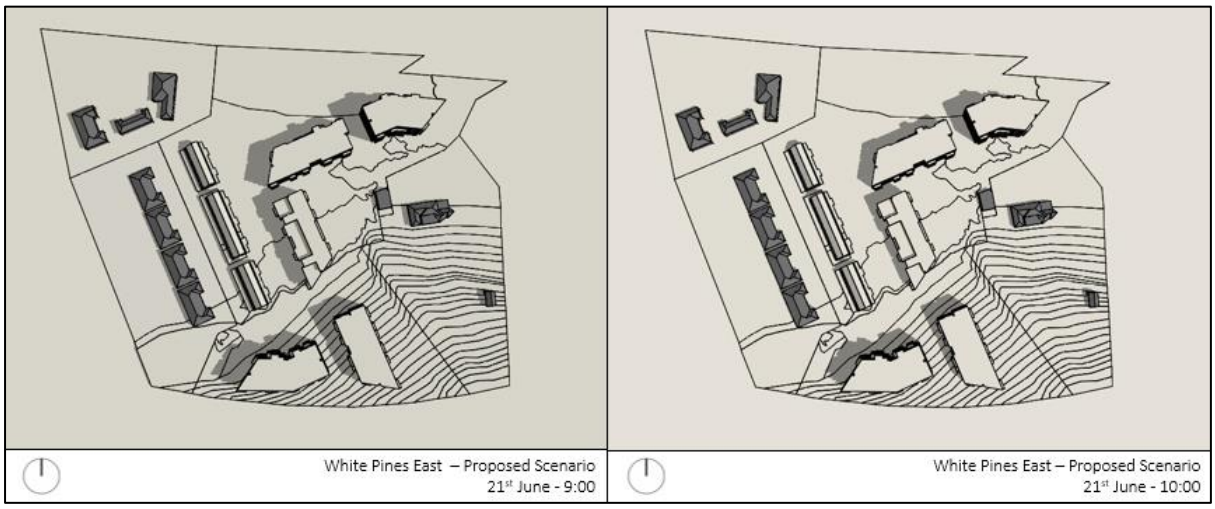


Figure B.1 – Overshadowing Image on June 21st at 9 a.m. and 10 a.m.

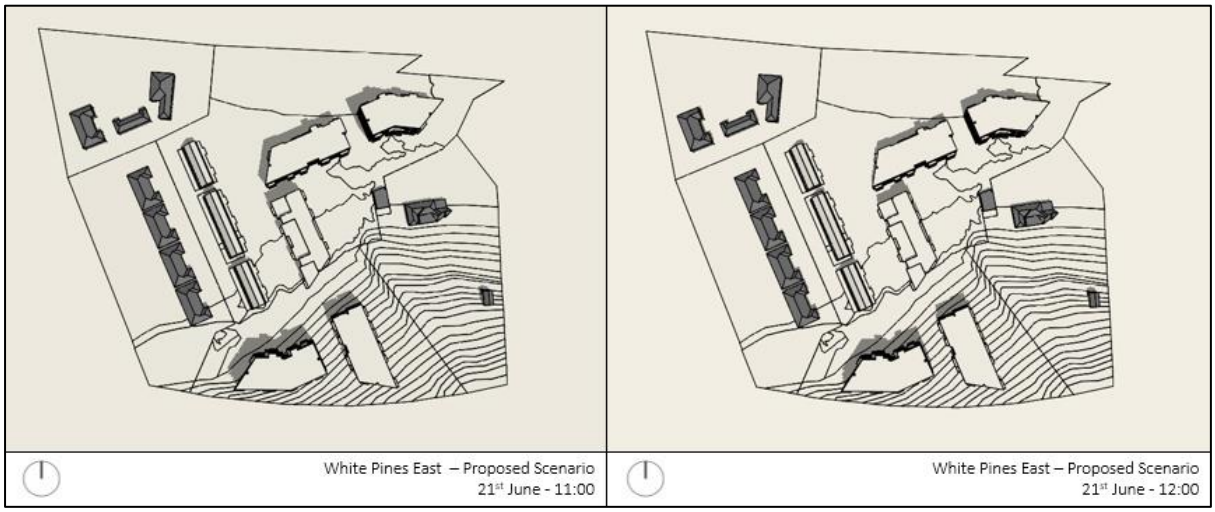


Figure B.2 – Overshadowing Image on June 21st at 11 a.m. and 12 p.m.

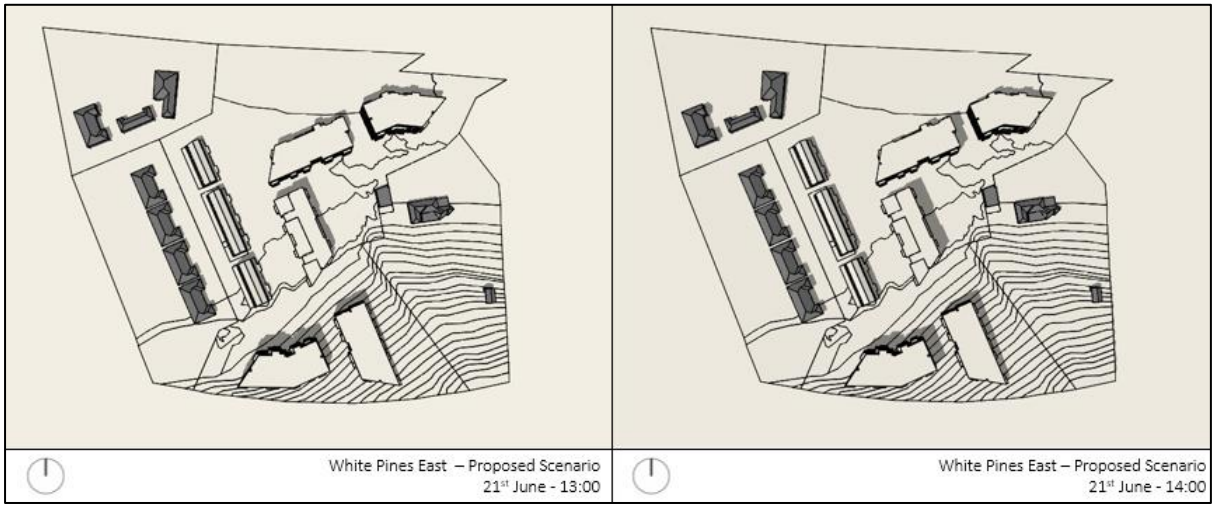


Figure B.3 – Overshadowing Image on June 21st at 1 p.m. and 2 p.m.

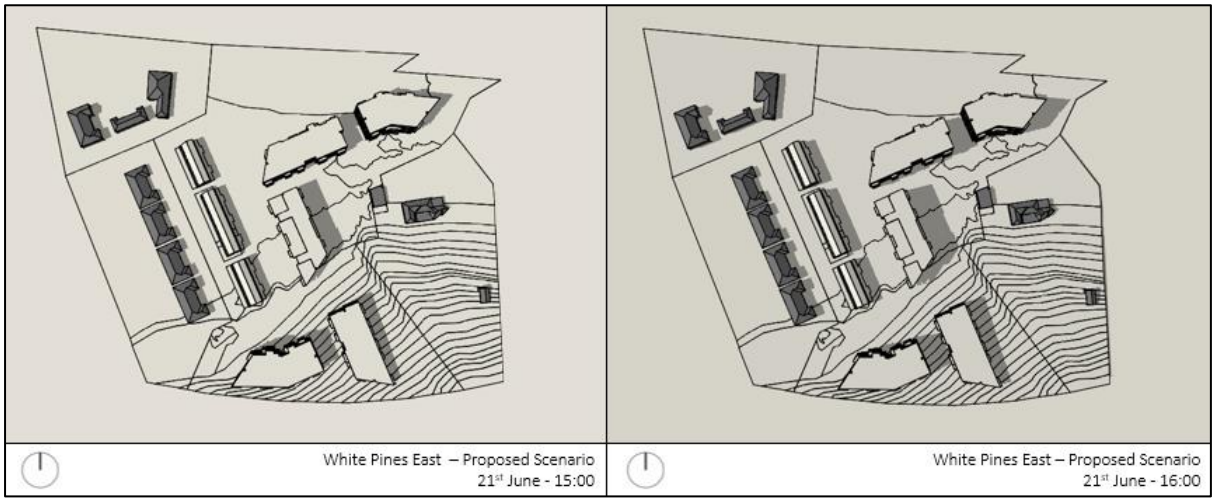


Figure B.4 – Overshadowing Image on June 21st at 3 p.m. and 4 p.m.

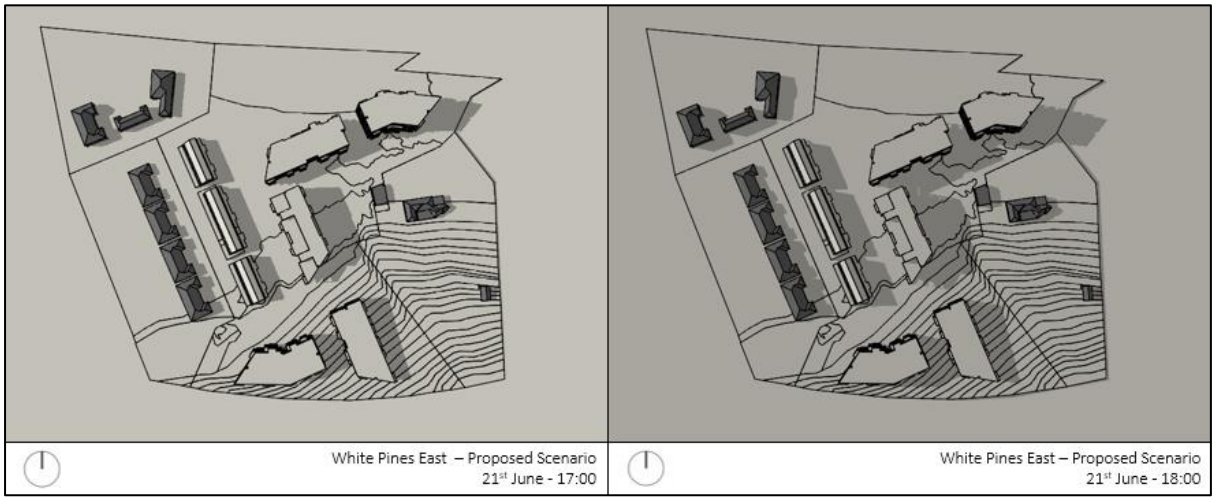


Figure B.5 – Overshadowing Image on June 21st at 5 p.m. and 6 p.m.

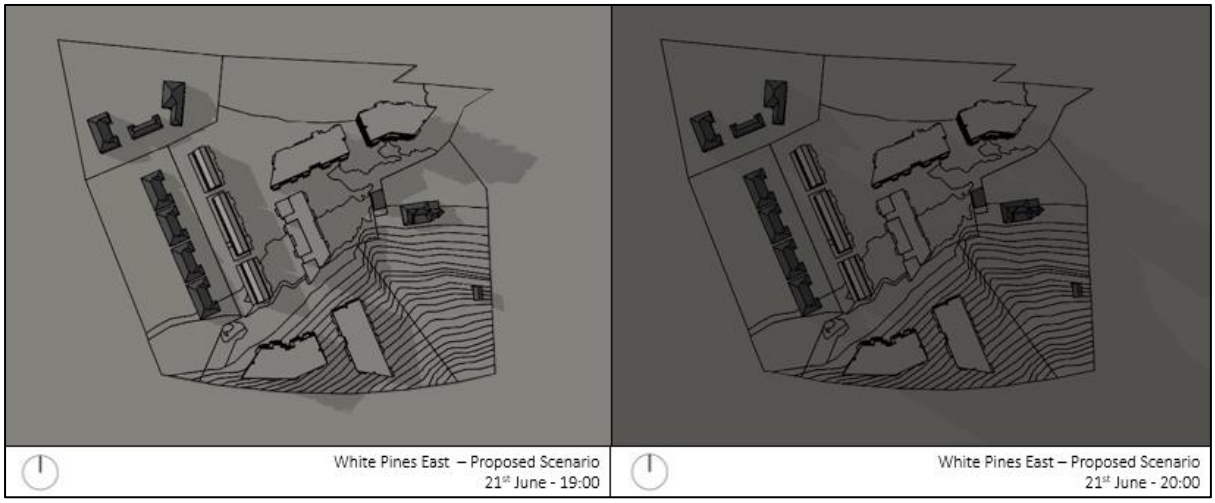


Figure B.6 – Overshadowing Image on June 21st at 7 p.m. and 8 p.m.

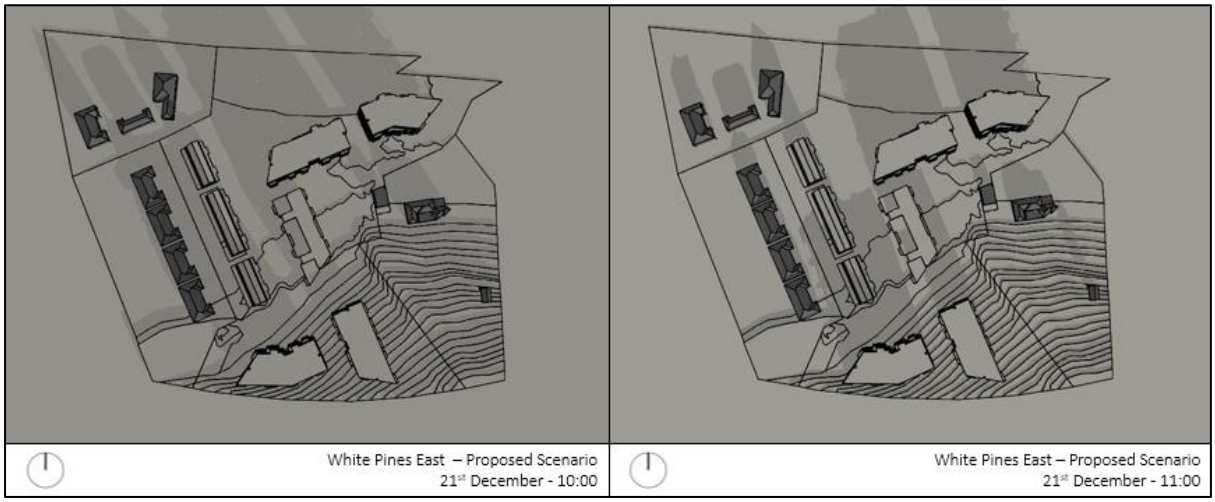


Figure B.7 – Overshadowing Image on December 21st at 10 a.m. and 11 a.m.

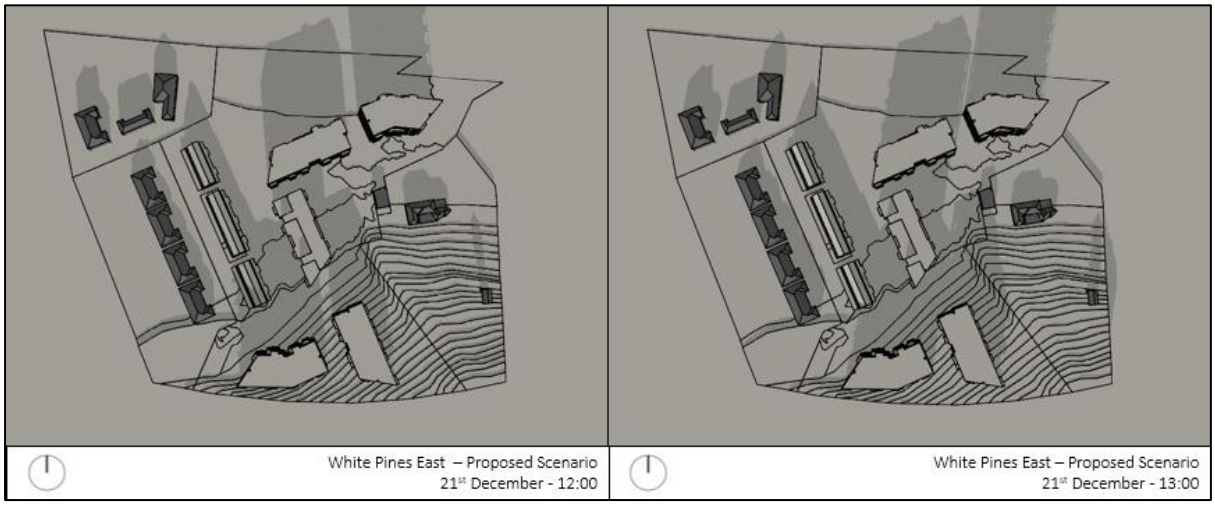


Figure B.8 – Overshadowing Image on December 21st at 12 p.m. and 1 p.m.

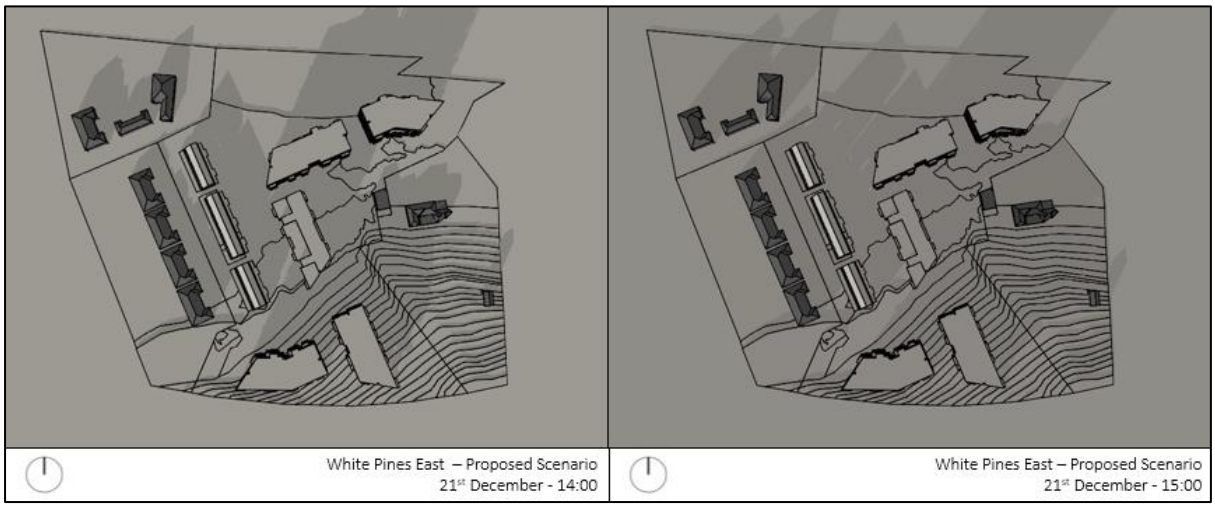


Figure B.9 – Overshadowing Image on December 21st at 2 p.m. and 3 p.m.



OCSC

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers

9 Prussia Street
Dublin 7
Ireland

T | +353 (0)1 8682000
F | +353 (0)1 8682100
W | www.ocsc.ie

APPENDIX 5 - PRELIMINARY CONSTRUCTION MANAGEMENT PLAN

INFRASTRUCTURE

Project

White Pines East Residential Development, Stocking Avenue, Dublin 16

Report Title

Preliminary Construction Management Plan

Client

Ardstone Homes Limited



DBFL CONSULTING ENGINEERS

March 2021

Document Control

Project Title: White Pines East Residential Development, Stocking Avenue, Dublin 16.

Project Number: 190230

Report Ref: 190230-rep-003

Author: Seán Byrne

Reviewed By: Brendan Keogh

Approved By:

Date: March 2021

Distribution: An Bord Pleanala

DBFL Consulting Engineers

Dublin Office
Ormond House
Upper Ormond Quay
Dublin 7

Tel 01 4004000
Fax 01 4004050
Email info@dbfl.ie
Web www.dbfl.ie

Waterford Office
The Atrium
Maritana Gate
Canada Street
Waterford

Tel 051 309500
Email info@dbfl.ie
Web www.dbfl.ie

Cork Office
Phoenix House
Monahan Road
Cork

Tel 021 2024538
Email info@dbfl.ie
Web www.dbfl.ie

Revision	Issue Date	Description	Prepared	Reviewed	Approved
Draft	April 2020	Draft	SB	BK	-
-	May 2020	Issued for ABP Pre-App	SB	BK	-
A	Feb 2021	ABP Application	SB	BK	
B	Mar 2021	ABP Application	SB	BK	

TABLE OF CONTENTS

1. WORKS PROPOSAL 3
2. COMPLIANCE WITH GENERAL SAFETY REQUIREMENTS 6
3. WORKING HOURS 6
4. TRAFFIC AND TRANSPORTATION 7
5. SOILS AND GEOLOGY 8
6. WATER AND HYDROGEOLOGY 10
7. WASTE MANAGEMENT 11
8. NOISE AND VIBRATION 13
9. AIR QUALITY AND CLIMATE 15
10. LANDSCAPE AND VISUAL IMPACT ASSESSMENT 16
11. MATERIAL ASSETS: SITE SERVICES 16
12. SITE COMPOUND FACILITIES AND PARKING 16

1. WORKS PROPOSAL

This Preliminary Construction Management Plan (PCMP) considers the proposed works associated with the construction of 241 No. residential units, residential tenant amenity space (reception area, games space, residents lounge and gym) and dedicated community space on a 2.98 Ha site at Stocking Avenue, Dublin 16.

The site, which is currently undeveloped, is located immediately to the east of the White Pine North development (recently completed by Ardstone Homes Limited, see Figure 1.1 below). The M50 motorway is located to the north of the site and Stocking Avenue runs along the site's southern boundary. An existing dwelling ("Green Acres House") and associated lands are located to the east of the site.

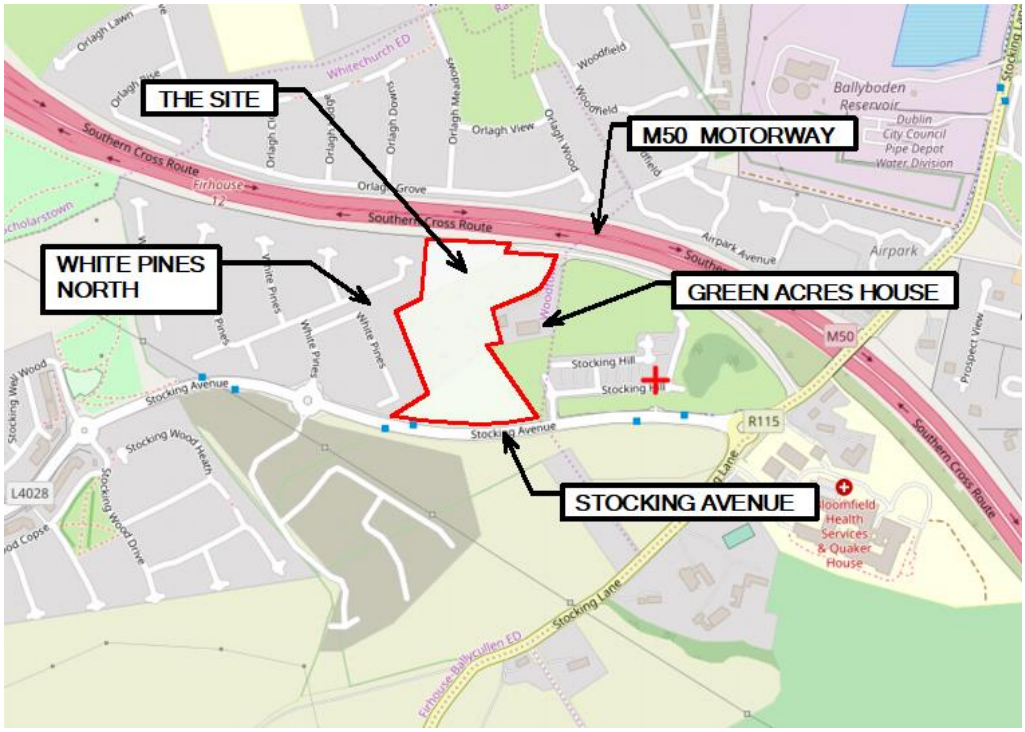


Figure 1.1 Site Location – Extract from EPA Map viewer (Site Boundary Indicative Only).

The site is in the immediate vicinity of several other developments by Ardstone Homes, as noted below (also refer to Figure 1.2).

- "Stocking North", Application Ref. SD14A/0222 which comprised of 178 residential dwellings (directly west of the subject application).
- "Stocking South", Application Reg. Ref. SD10A/0041 which comprised of 106 residential dwellings (to the south of the subject application).
- "Stocking Neighbourhood Centre (Application Ref SD19A/0345) which has recently been granted planning permission.



Figure 1.2, Extract from Google Earth (Site Boundary Indicative Only)

This project is currently at planning stage and as such input from the contractor has not been incorporated into this document.

On appointment of a contractor a detailed CMP shall be prepared. The detailed CMP shall incorporate the requirements of the Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects (DoEHLG, 2006).

The development will also include the following associated engineering infrastructure:

- Formation of an access onto Stocking Avenue to facilitate the primary vehicle access to the site (including minor modifications to existing pedestrian and cycle facilities along Stocking Avenue and relocation of a bus stop.
- Provision of internal site roads including associated footpaths.
- Provision of surface water drainage, foul drainage and water supply infrastructure.

The construction management issues addressed within this plan include the following:

- Health and Safety
- Working Hours
- Traffic Management
- Stripping of Topsoil
- Excavation of Subsoil
- Importation of fill
- Erosion and Sediment Control
- Accidental Spills and Leaks
- Waste Management
- Noise and Vibration
- Air Quality and Dust Control
- Landscape and Visual Impact
- Material Assets – Site Services
- Site Compound Facilities and Parking

This Preliminary Construction Management Plan shall be referenced in all tender and contract documentation for the proposed works and is to be read in conjunction with all relevant Engineering and Architectural documentation.

2. COMPLIANCE WITH GENERAL SAFETY REQUIREMENTS

The Contractor shall be responsible for overall management of the site for the duration of the proposed works and must progress their works with reasonable skill, care, diligence and to proactively manage the works in a manner most likely to ensure the safety and welfare of those carrying out construction works.

The Contractor shall comply with all relevant Statutory requirements such as the 2005 Safety Health and Welfare at Work Act, The Construction Regulations (SI 291 of 2013), the General Application Regulations (SI 299 of 2007), etc. (and any amendments thereof).

In addition, the Contractor shall comply with all the reasonable safety requirements of the Client, the Project Supervisor for the Design Process and the Project Supervisor for the Construction Stage.

3. WORKING HOURS

For the duration of the proposed infrastructure works, the maximum working hours shall be 07:00 to 19:00 Monday to Friday (excluding bank holidays) and 09:00 to 13:00 Saturdays, subject to the restrictions imposed by the local authority.

No working will be allowed on Sundays and Public Holidays.

Subject to the agreement of the local authority, out of hours working may be required for water main connections, foul drainage connections etc.

4. TRAFFIC AND TRANSPORTATION

A Traffic Management Plan (TMP) will be prepared for the site works in accordance with the principles outlined below and shall comply at all times with the requirements of:

- Department of Transport Traffic Signs Manual 2010 – Chapter 8 Temporary Traffic Measures and Signs for Roadworks
- Department of Transport Guidance for the Control and Management of Traffic at Road Works (2010)
- Any additional requirements detailed in the Design Manual for Roads and Bridges (DMRB) & Design Manual for Urban Roads & Streets (DMURS)

The contractor shall prepare a detailed traffic management plan for works at that interface with the existing road network and obtain all required road opening licenses from South Dublin County Council.

Construction Traffic will consist of the following categories:

- Private vehicles owned and driven by site staff and management
- Construction vehicles e.g. excavation plant, dump trucks (including trucks for delivery of imported fill to site.
- Materials delivery vehicles involved in site development works

On-site employees will generally arrive before 08:00, thus avoiding morning peak hour traffic. These employees will generally depart after 16:00. It should be noted that a large proportion of construction workers would arrive in shared transport.

In general, the impact of the construction period will be temporary in nature.

HGV vehicle movements not expected to exceed 5 vehicles per hour during the busiest period of construction works.

Excavated material will be reused as part of the site development works where possible to minimise truck movements to and from the site (e.g. use as non-structural fill under green areas).

Access for construction of the development will be via the proposed primary access for the development (i.e. directly from Stocking Avenue). This will be the only access for vehicles to the site.

All construction traffic will be routed to the site via the primary road network in the area (i.e. M50 Motorway).

Queuing of material delivery vehicles to the site will not be permitted on Stocking Avenue.

Wheel wash facilities will also be provided and adjacent public roads swept as required.

5. SOILS AND GEOLOGY

Site development works will include stripping of topsoil, excavation of subsoil layers and the importation of fill. These activities have potential to expose the soils and geological environment to pollution.

The contractor shall obtain approval of their proposed erosion and sediment control measures from South Dublin County Council's Environment Section prior to commencing works on site.

The following measures are to be implemented in order to mitigate against such risks.

Stripping of Topsoil

- Stripping of topsoil will be carried out in a controlled and carefully managed way
- At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains
- Topsoil stockpiles will also be located so as not to necessitate double handling

Excavation of Subsoil Layers

- The duration that subsoil layers are exposed to the effects of weather will be minimised
- Disturbed subsoil layers will be stabilised as soon as practicable (e.g. backfill of drainage trench, construction of road capping layers, construction of building foundations and completion of landscaping)
- Stockpiles of excavated subsoil material will be protected for the duration of the works, stockpiles of subsoil material will be located separately from topsoil stockpiles

Weather Conditions

- Typical seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations with an objective of minimising soil erosion

Dust Control

- Dust suppression practices are to be implemented during stripping of topsoil layers and excavation of subsoil layers and importation of fill as outlined in Section 9 of this Preliminary Construction Management Plan

Importation of Fill

- Materials imported to site will be natural stones sourced from locally available quarries, greenfield / inert soil imported under a Waste Permit issued by the local authority; or materials that have been approved as by-products by the EPA in accordance with the EPA's criteria for determining a material is a by-product, per the provisions of article 27(1) of the European Communities (Waste Directive) Regulations, 2011.
- Imported fill materials will be granular in nature and used in the construction of road pavement foundations, drainage and utility bedding and surrounds.
- Materials will be brought to site and placed in their final position in the shortest possible time. Any imported material will be kept separate from material excavated from the site. All excavation to accommodate imported material will be precisely coordinated to ensure no surplus material is brought to site beyond the engineering requirement.
- No large or long-term stockpiles of imported fill material will be held on the site. At any time, the extent of fill material held on site will be limited to that needed in the immediate vicinity of the active work area.
- Smaller stockpiles of fill where required, will be suitably protected to ensure no sediment laden runoff enters existing surface water drains. Such stockpiles are to be located in order to avoid double handling.

6. WATER AND HYDROGEOLOGY

The following measures are to be implemented during the construction phase in order to mitigate risks to the water and hydrogeological environment.

Erosion and Sediment Control

- Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection, fencing and signage around specific exclusion zones and earth bunding adjacent to open drainage ditches)
- 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
- On-site settlement ponds are to include geotextile liners and riprapped inlets and outlets to prevent scour and erosion
- Surface water discharge points during the construction phase are to be agreed with South Dublin County Council's Environment Section prior to commencing works on site

Accidental Spills and Leaks

- All oils, fuels and other chemicals will be stored in a secure bunded hardstand area
- Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (when not possible carry out such activities off site)
- A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment

Concrete

- Concrete batching will take place off site, wash down and wash out of concrete trucks will take place off site and any excess concrete is not to be disposed of on site
- Pumped concrete will be monitored to ensure there is no accidental discharge
- Mixer washings are not to be discharged into surface water drains

Wheel Wash Areas

- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds, debris and sediment captured by vehicle wheel washes are to be disposed off-site at a licensed facility

7. WASTE MANAGEMENT

The principle of 'Duty of Care' in Waste Management Act 1996-2008 states that the waste producer is responsible for waste from the time it is generated through to its legal disposal (including its method of disposal). Waste materials generated by earthworks, demolition and construction activities will be managed according to the Department of the Environment, Heritage and Local Government's 2006 Publication – Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects.

The following measures are to be implemented during the construction phase in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle waste in such a manner as to minimise the effect on the environment

This project is currently at planning stage and as such input from the contractor has not been incorporated into this document. On appointment of a contractor a detailed CMP shall be prepared. The detailed CMP shall incorporate the requirements of the Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects (DoEHLG, 2006).

- Copies of the final Construction Waste Management Plan will be made available to all relevant personnel on site. All site personnel and sub-constructors will be instructed on the objectives of the Construction Waste Management Plan and informed of their responsibilities.
- The nominated Construction Waste Manager responsible for implementation of this Construction Waste Management Plan will be identified prior to construction commencement and will arrange for a waste audit of the project once construction has fully commenced on site (and of any facilities to which waste from the project is delivered as required).
- Building materials should be chosen with an aim to 'design out waste'
- All wastes segregated at source where possible
- On-site segregation of non-hazardous waste materials into appropriate categories. All waste material will be stored in skips or other suitable receptacles in a designated area of the site
- On-site segregation of hazardous waste materials into appropriate categories. Hazardous waste will be separately stored in appropriate lockable containers prior to removal from site by an appropriate waste collection licence holder.

- Waste bins, containers, skip containers and storage areas will be clearly labelled with waste types which they should contain including photographs as appropriate.
- The site will be maintained to prevent litter and regular litter picking will take place throughout the site.
- Materials will be ordered on a 'just in time' basis to prevent over supply and site congestion (i.e. to minimise materials stored on site)
- Materials will be correctly stored and handled to minimise the generation of damaged materials
- Left over materials (e.g. timber off-cuts) shall be re-used on site where possible
- All waste leaving the site will be recycled, recovered or reused where possible
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities

8. NOISE AND VIBRATION

During the works the contractor shall comply with the requirements of BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014 (Code of Practice for Noise and Vibration Control on Construction and Open Sites), Safety, Health and Welfare at Work (General Application) Regulations 2007, Part 5 Noise and Vibration and implement all construction phase mitigation measures identified in EIAR Chapter 12, Noise and Vibration.

In particular, the following practices are to be implemented during the construction phase:

- Limiting the hours during which site activities that are likely to create high levels of noise and vibration are permitted
- Erection of a barrier (e.g. Standard 2.4m high construction hoarding) to remove direct line of sight between noise source and receiver when construction works are being carried out in proximity to noise sensitive receivers
- Establishing channels of communication between the contractor, local authority and residents
- Appointing a site representative responsible for matters relating to noise
- A noise and vibration monitoring specialist will be appointed to periodically carry out independent monitoring of noise and vibration during random intervals and at sensitive locations for comparison with limits and background levels
- Selection of plant with low inherent potential for generation of noise
- Siting of noisy plant as far away from sensitive properties as permitted by site constraints and implementation of noise reduction measures such as acoustic enclosures
- Avoid unnecessary revving of engines and switch off plant when idle
- All vehicles and mechanical plant used for the purpose of the works shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order. In addition, all diesel engine powered plant shall be fitted with effective air intake silencers.
- All ancillary pneumatic percussive tools shall be fitted with mufflers or silences of the type recommended by the manufacturers, and where commercially available, dampened tools and accessories shall be used.

Noise Limits

Noise Limits to be applied for the duration of construction works are as set out in the National Roads Authority (NRA) Guidelines for Treatment of Noise and Vibration in National Roads Schemes (summarised below in Figure 9.1) and BS 5228-1:2009+A1:2014 (Code of Practice for Noise Control on Construction and Open Sites).

Date	Noise Level (dB re $2x10^{-5}$ Pa)	
	$L_{Aeq(1hr)}$	L_{AFmax}
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60*	65*
Saturdays 08:00 to 16:30hrs	65	75
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

Figure 9.1, NRA Guidelines for Maxium Permissible Noise Levels at the Façade of Dwellings During Construction.

BS 5228 applies a noise limit of 70 dBA between 07:00 am and 19:00 pm outside the nearest window of the occupied room closest to the site boundary in suburban areas away from main road traffic and industrial noise.

For the duration of construction works, a daytime noise limit (07:00 am to 19:00 pm) of 70 dBA shall apply (in accordance with the requirements of BS 5228 and generally in agreement with the NRA guidelines).

Vibration Limits

Vibration Limits to be applied for the duration of construction works are as set out in BS 5228-2:2009+A1:2014 (Code of Practice for Vibration Control on Construction and Open Sites) and BS 7385: 1993 (Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration). Allowable vibration during the construction phase is summarised below in Figure 9.2.

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 4Hz	15 to 40Hz	40Hz (and above)
12 mm/s	12.5 mm/s	50 mm/s

Figure 9.2, Allowable Vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration

9. AIR QUALITY AND CLIMATE

The primary air quality impact during the construction phase relates to nuisance dust emissions.

The following dust suppression practices are to be implemented during the construction phase (as well as implementing all construction phase mitigation measures identified in the EIAR):

- The Contractor shall prepare a dust minimisation plan which shall be communicated to all site staff
- 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 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)
- Vehicles delivering material with dust potential (soil, aggregates etc.) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust
- Public roads outside the site will be inspected on a daily basis for cleanliness and cleaned as necessary
- Debris, sediment, grit etc. captured by road sweeping vehicles is to be disposed off-site at a licensed facility
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate prior to entering onto public roads
- 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

Monitoring of dust deposition levels (via the Bergerhoff method) shall take place at a number of locations at the site boundary of the proposed development to ensure that dust nuisance is not occurring at nearby sensitive receptors. This monitoring aims to ensure that the dust mitigation measures outlined above remain effective.

10. LANDSCAPE AND VISUAL IMPACT ASSESSMENT

Mitigation measures relating to landscape and visual impact include (but are not limited to) those noted below:

- Establishment of tree protection measures as required (no-dig construction zones, tree protection fencing and existing hedgerow retention). Any trees which are not to be taken down shall remain undisturbed and undamaged
- Tree protection fences if required are to be constructed in accordance with BS 5837:2012 "Trees in Relation to Design, Demolition and Construction - Recommendations"
- A 'Construction Exclusion Zone' notice shall be placed on tree protection fencing at regular intervals
- Tree Protection Zones are not to be used for car parking, storage of plant, equipment or materials
- A post construction re-assessment of any retained trees shall be carried out

Regarding visual impact, Landscape and Visual Impact are to be mitigated by implemented including erection of site hoarding to restrict views of the construction activity e.g. standard 2.4m high construction hoarding.

11. MATERIAL ASSETS: SITE SERVICES

Existing Underground Services

- The location of all existing underground services are to be confirmed by the contractor prior to commencing any works on site.
- In particularly, the contractor is to confirm the location of existing Irish Water twin trunk water mains that traverse the site. Any exploratory works or permanent works in the vicinity of these watermains are to be carried out strictly in accordance with the Irish Water Code of Practice for Water Supply with site attendance by Irish Water's field engineers as required.

Existing Overhead Services

- Existing overhead ESB lines are located in the vicinity of the site entrance / along the site's southern boundary. For works in the vicinity of existing overhead electrical lines refer to ESB's Code of Practice for Avoiding Danger from Overhead Electrical Lines.

12. SITE COMPOUND FACILITIES AND PARKING

The exact location of the construction compound is to be confirmed in advance of commencement of the works (and agreed with South Dublin County Council).

- The construction compound will include adequate welfare facilities such as wash rooms, drying rooms, canteen and first aid room as well as foul drainage and potable water supply
- Foul drainage discharge from the construction compound will be tankered 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 protected from contamination by any construction activities or materials
- The construction compound will be enclosed by a security fence
- Access to the compound will be security controlled and all site visitors will be required to sign in on arrival and sign out on departure
- A permeable hardstand area will be provided for staff carparking
- A separate permeable hardstand area will be provided for construction machinery and plant
- The construction compound will include a designated Construction material recycling area
- A series of way finding signage will be provided to direct staff, visitors and deliveries as required
- All construction materials, debris, temporary hardstands etc. in the vicinity of the site compound will be removed off-site on completion of the works