

Environmental Impact Assessment Report (EIAR)

Volume 1 Main Statement

Strategic Housing Development at
'Hartfield Place', Swords Road, Whitehall, Dublin
9

March 2022

Prepared by McGill Planning

In association with

PUNCH Consulting Engineers
Traynor Environmental
Macroworks
John Purcell Archaeological Consultancy
JBA Consulting
AECOM Engineering



CONTENTS

VOLUME 1 – MAIN STATEMENT

Chapter 1 Introduction and Methodology

1.1	Introduction	1-1
1.2	Legislative Context	1-1
1.3	Definition of EIA	1-2
1.4	EIA Screening	1-2
1.5	EIA Scoping.....	1-3
1.6	EIAR Objectives	1-4
1.7	EIAR Format & Content.....	1-4
1.8	Methodology.....	1-4
1.9	Competency	1-5
1.10	Difficulties In Compiling The Specified Information	1-7
1.11	Availability Of The EIAR.....	1-7

Chapter 2 Alternatives

2.1	Terms of Reference.....	2-1
2.2	Introduction	2-1
2.3	Alternative Locations	2-1
2.4	Alternative Uses.....	2-2
2.5	Do-Nothing Alternative.....	2-2
2.6	Alternative Designs And Layouts	2-2
2.7	Alternative Processes.....	2-10
2.8	Summary Table Of Alternative Designs And Environmental Impacts.....	2-10
2.9	References	2-10

Chapter 3 Description of Development

3.1	Introduction	3-1
3.2	Characteristics Of The Site	3-1
3.3	Proposed Development	3-1
3.4	Construction Stage.....	3-3
3.5	Operational Stage	3-4
3.6	Changes, Secondary Developments, Cumulative Impacts.....	3-4

Chapter 4 Population and Human Health

4.1	Introduction	4-1
4.2	Methodology.....	4-1
4.3	Receiving Environment	4-1
4.4	Characteristics of the Proposed Development.....	4-9
4.5	Potential Impacts	4-9
4.6	Potential Cumulative Impacts.....	4-12
4.7	Mitigation Measures.....	4-12
4.8	Predicted Impacts	4-13
4.9	Conclusions	4-13
4.10	Monitoring and Reinstatement	4-13
4.11	Difficulties in Compiling Information	4-13
4.12	References	4-13

Chapter 5 Biodiversity

5	Biodiversity.....	5-1
---	-------------------	-----

5.1	Introduction	5-1
5.2	Methodology.....	5-1
5.3	Receiving Environment	5-6
5.4	Characteristics of the Proposed Development.....	5-14
5.5	Potential Impacts	5-15
5.6	Potential Cumulative Impacts.....	5-16
5.7	Mitigation Measures.....	5-18
5.8	Predicted Impacts	5-20
5.9	Do Nothing Scenario	5-21
5.10	Worst Case Scenario	5-21
5.11	Monitoring and Reinstatement	5-21
5.12	Difficulties in Compiling Information.....	5-21
5.13	References	5-21

Chapter 6 Land, Soil and Geology

6.1	Introduction	6-1
6.2	Methodology.....	6-1
6.3	Receiving Environment	6-2
6.4	Characteristics of The Proposed Development	6-4
6.5	Potential Impacts	6-4
6.6	Potential Cumulative Impacts.....	6-5
6.7	Mitigation Measures.....	6-5
6.8	Predicted Impacts	6-6
6.9	‘Do Nothing’ Scenario	6-6
6.10	Worst Case Scenario	6-6
6.11	Monitoring & Reinstatement.....	6-6
6.12	Difficulties in Compiling Information.....	6-6
6.13	References	6-6

Chapter 7 Hydrology and Water Services

7.1	Introduction	7-1
7.2	Methodology.....	7-1
7.3	Receiving Environment	7-1
7.4	Characteristics of The Proposed Development	7-3
7.5	Potential Impacts	7-3
7.6	Potential Cumulative Impacts.....	7-3
7.7	Mitigation Measures.....	7-4
7.8	Predicted Impacts	7-4
7.9	‘Do Nothing’ Scenario	7-4
7.10	Worst Case Scenario	7-4
7.11	Monitoring & Reinstatement.....	7-4
7.12	Difficulties in Compiling Information.....	7-4
7.13	References	7-4

Chapter 8 Noise and Vibration

8.1	Introduction	8-1
8.2	Methodology.....	8-1
8.3	Receiving Environment	8-3
8.4	Characteristics of the Proposed Development.....	8-3
8.5	Assessment of Site Suitability	8-4

8.6	Potential Impacts	8-4
8.7	Potential Cumulative Impacts	8-5
8.8	Mitigation Measures	8-6
8.9	Residual Effects	8-6
8.10	Do Nothing Scenario	8-6
8.11	Worst Case Scenario	8-6
8.12	Monitoring and Reinstatement	8-6
8.13	Difficulties in Compiling Information	8-6
8.14	References	8-6

Chapter 9 Climate and Air Quality

9.1	Introduction	9-1
9.2	Methodology	9-1
9.3	Receiving Environment	9-4
9.4	Characteristics Of The Proposed Development	9-9
9.5	Potential Impacts	9-9
9.6	Potential Cumulative Impacts	9-13
9.7	Mitigation Measures	9-13
9.8	'Do Nothing' Scenario	9-15
9.9	Worst Case Scenario	9-15
9.10	Monitoring & Reinstatement	9-15
9.11	Difficulties In Compiling Information	9-15
9.12	Residual Impacts	9-15
9.13	References	9-16

Chapter 10 Landscape and Visual

10.1	Introduction	10-1
10.2	Methodology	10-1
10.3	Receiving Environment	10-5
10.4	Characteristics of the Proposed Development	10-6
10.5	Potential Impacts	10-7
10.6	Landscape/townscape Impacts	10-7
10.7	Visual Impact Assessment	10-8
10.8	Do Nothing Scenario	10-15
10.9	Conclusion	10-15
10.10	Overall Significance of impact	10-15

Chapter 11 Traffic and Transport

11.1	Introduction	11-1
11.2	Methodology	11-1
11.3	Receiving Environment	11-2
11.4	Characteristics of the Proposed Development	11-5
11.5	Potential Impacts	11-5
11.6	Potential Cumulative Impacts	11-8
11.7	Mitigation Measures	11-8
11.8	Predicted Impacts	11-8
11.9	Do Nothing Scenario	11-8
11.10	Worst Case Scenario	11-8
11.11	Monitoring and Reinstatement	11-8
11.12	Difficulties in Compiling Information	11-8
11.13	References	11-8

Chapter 12 Material Assets

12.1	Introduction	12-1
12.2	Methodology	12-1
12.3	Receiving Environment	12-1
12.4	Characteristics of the Proposed Development	12-1
12.5	Potential Impacts	12-2
12.6	Potential Cumulative Impacts	12-3
12.7	Mitigation Measures	12-3
12.8	Predicted Impacts	12-4
12.9	Do Nothing Scenario	12-4
12.10	Worst Case Scenario	12-4
12.11	Monitoring and Reinstatement	12-4
12.12	Difficulties in Compiling Information	12-4
12.13	References	12-4

Chapter 13 Waste

13.1	Introduction	13-1
13.2	Methodology	13-1
13.3	Receiving Environment	13-2
13.4	Characteristics Of The Proposed Development	13-2
13.5	Potential Impacts Of The Proposed Development	13-2
13.6	Potential Cumulative Impacts	13-4
13.7	Mitigation Measures	13-4
13.8	Predicted Impacts	13-5
13.9	'Do Nothing' Scenario	13-5
13.10	Worst Case Scenario	13-5
13.11	Monitoring & Reinstatement	13-5
13.12	Difficulties In Compiling Information	13-5
13.13	References	13-5

Chapter 14 Cultural Heritage and Archaeology

14.1	Introduction	14-1
14.2	Methodology	14-1
14.3	Receiving Environment	14-1
14.4	Characteristics of the Proposed Development	14-2
14.5	General archaeological and historical summary	14-2
14.6	Potential Impacts	14-4
14.7	Potential Cumulative Impacts	14-5
14.8	Mitigation Measures	14-5
14.9	Predicted Impacts	14-5
14.10	Do Nothing Scenario	14-5
14.11	Worst Case Scenario	14-5
14.12	Monitoring and Reinstatement	14-5
14.13	Difficulties in Compiling Information	14-5
14.14	References	14-5

Chapter 15 Interactions

15.1	Introduction	15-1
15.2	Assessment	15-1

Chapter 16 Schedule of Mitigation Measures

16.1	Introduction	16-1
16.2	Construction Phase	16-1
16.3	Operational Phase.....	16-8

LIST OF FIGURES

Chapter 2 Alternatives Considered

Figure 2.1 Site location on Dublin City Development Plan 2016-2022 Zoning Map B.....	2-1
Figure 2.2 Route of Dublin Port Tunnel through subject site (as shown on Development Plan Map B).....	2-2
Figure 2.3 Whitehall Framework Plan Site Area	2-3
Figure 2.4 Whitehall Framework Plan Vision Layout	2-3
Figure 2.5 Whitehall Framework Plan Open Space Strategy	2-3
Figure 2.6 Whitehall Plan Height Strategy	2-4
Figure 2.7 Alternative Layout A – 2008 Layout.....	2-5
Figure 2.9 Alternative B Layout (DCC Reg Ref 3269/10).....	2-6
Figure 2.8 Alternative Layout C - 2019 Layout.....	2-7
Figure 2.10 Alternative D Layout (ABP 309608 - Previous SHD Submitted and Refused)	2-8
Figure 2.11 Alternative E Layout (Chosen Layout).....	2-9

Chapter 3 Description of Development

Figure 3-1: Site Location (Source: Google Maps, 2022).....	3-1
Figure 3-2 Whitehall Framework Plan site area.....	3-4

Chapter 4 Population and Human Health

Figure 4-1 Electoral Divisions within 1km and 500m of Subject Site.....	4-1
Figure 4-2 Local Area 2011 and 2016 Population Pyramids. Data Source: CSO	4-2
Figure 4-3 Raw Change in Local Area Population from 2011-2016 by Age Group. Data Source: CSO	4-3
Figure 4-4 % Change in Population from 2011-2016 by Age Group. Data Source: CSO	4-3
Figure 4-5 Neighbourhood centres surrounding the subject site within a 1km buffer distance	4-4
Figure 4-6 Health Facilities in relation to subject site within a 1km buffer distance.	4-4
Figure 4-7 Park, recreational and sports facilities within 1km distance of the Subject site.....	4-5
Figure 4-8 Locations of Childcare Facilities within 1km of the Subject Site	4-7
Figure 4-9 Schools within 1km of subject site	4-8
Figure 4-10 Extract from Quarterly National Household Survey, 2016 Q4 Module on Childcare.....	4-11
Figure 4-11 Projected Primary School Enrolment. Source: Dept. of Education	4-12
Figure 4-12 Projected Post-Primary Enrolment. Source: Dept. of Education.....	4-12

Chapter 5 Biodiversity

Figure 5-1: Site location	5-1
Figure 5-2: Observation location for flight line survey undertaken December 2021-February 2022, tandem surveys and location of spot checks carried out.....	5-6
Figure 5-3: Changes in land use of site and surrounds: (a) prior to Dublin Port Tunnel works (b & c) during building of Port Tunnel and (d) showing revegetation after completion of tunnel works (OSI, 2020).....	5-6
Figure 5-4: Natura 2000 sites within 15km of the proposed development (NPWS, 2021).....	5-7
Figure 5-5: pNHA sites within 15km of the proposed development (NPWS, 2021).....	5-8
Figure 5-6: River network (EPA, 2021).....	5-8
Figure 5-7: Aquifer vulnerability of the proposed site and surrounding (EPA, 2021).....	5-9
Figure 5-8: Habitat Map.....	5-9
Figure 5-9: Grassland within the site.....	5-10
Figure 5-10: Entrance to mammal hole (left) and mammal tracks in vegetation (right).....	5-11
Figure 5-11: Ash and Sycamore trees at site entrance, just outside site boundary.....	5-11
Figure 5-12: Proposed development site (a) and GAA pitch north of site (b).....	5-13

Figure 5-13: Winter Heliotrope (left) and Cotoneaster with Privet (right).....	5-14
Figure 5-14: Proposed location of dark corridor and how it connects with the wider landscape. (ref. landscape architect).....	5-19

Chapter 6 Land Soil and Geology

Figure 6-1 Quaternary Sediments (www.gsi.ie).....	6-2
Figure 6-2 GSI Bedrock Map (www.gsi.ie)	6-3
Figure 6-3 Subsurface ground profile along northbound tunnel within site from AGL Consulting Geotechnical Engineer’s Tunnel Impact Assessment	6-3
Figure 6-4: National Vulnerability Map (www.gsi.ie)	6-4

Chapter 7 Hydrology and Water Services

Figure 7-1: Existing Surface Water Drainage in the Vicinity of the Swords Road site (Irish Water Records)	7-1
Figure 7-2: Existing Foul Drainage in the Vicinity of the Swords Road site (Irish Water Records)	7-2
Figure 7-3: Existing Water Mains in the Vicinity of the Swords Road site (Irish Water Records).....	7-2
Figure 7-4 Location of adjacent watercourse - River Tolka (EPA maps)	7-2

Chapter 9 Air and Climate

Figure 9-1 Dublin Airport Windrose 2009-2017	9-5
Figure 9-2 PM10 Monitoring Locations	9-6
Figure 9-3 PM2.5 Monitoring Locations	9-8
Figure 9-4 Link Roads	9-10
Figure 9-5 Approximate Sensitive Receptor Locations used in Modelling Assessment	9-11

Chapter 10 Landscape and Visual

Figure 10.1 Building elevations from the original (2010) permitted development.....	10-1
Figure 10.2 3D view of the modified Block F from the permitted 2019 amendment application	10-1
Figure 10.3 Oblique view (looking north) of the 1km radius Study area for the proposed development	10-5
Figure 10.4: Extract of Map B of the Dublin CDP, showing how the site is contained within ‘Z12’ designation .	10-6
Figure 10.5: Viewpoint Selection Map (Source - Model Works).....	10-7
Figure 10.6: VP1 Outline comparison with permitted development	10-9
Figure 10.7: VP2 Outline comparison with permitted development	10-9
Figure 10.8: VP2a Outline comparison with permitted development.....	10-10
Figure 10.9: VP3 Outline comparison with permitted development	10-11
Figure 10.10: VP3a Outline comparison with permitted development	10-12
Figure 10.11: VP4 Outline comparison with permitted development	10-12
Figure 10.12: VP5 Outline comparison with permitted development	10-13
Figure 10.13: VP6 Outline comparison with permitted development	10-14
Figure 10.14: VP7 Outline comparison with permitted development	10-14

Chapter 11 Traffic and Transport

Figure 11-1 Application Site Location	11-1
Figure 11-2 Site Context.....	11-2
Figure 11.3 Land Use Zoning.....	11-2
Figure 11-4 N1 Northbound at site Access	11-3
Figure 11-5 Iveragh Road Existing Arrangement	11-3
Figure 11-6 Existing Cycling Facilities.....	11-3
Figure 11-7 Public Transport Infrastructure	11-4

Figure 11-8 Road Collisions 11-4
Figure 11-9 Staff Trip Distribution 11-5
Figure 11-10 Delivery Vehicle Trip Distribution 11-6
Figure 11-11 Percentage Impact at Junctions – Construction of Proposed Development..... 11-6

Chapter 14 Cultural Heritage and Archaeology

Figure 14-1 2005 Aerial photograph of the site showing the level of disturbance 14-2
Figure 14-2 RMP Extract with the Location of the Study Area Marked..... 14-3
Figure 14-3 First edition OS map for the site 14-4
Figure 14-4 25" OS map for the site..... 14-4

LIST OF TABLES

Chapter 1 Introduction

Table 1-1 List of EIAR Chapters	1-4
Table 1-2 Description of Effects (Table 3.3 of the EPA 2017 Guidance)	1-5
Table 1-3 Competencies of Consultants	1-6

Chapter 2 Alternatives Considered

Table 2-1 Permissible Use and Open for Consideration Uses in Z12 zoning	2-2
Table 2-2 Comparison of Effects	2-10

Chapter 3 Description of Development

Table 3-1 Proposed Apartment Blocks - Unit Numbers and Heights.....	3-2
---	-----

Chapter 4 Population and Human Health

Table 4-1 Census Population Data for Electoral Divisions in chosen catchment area (1km Distance). Data Source: CSO	4-1
Table 4-2 2011 and 2016 Census Data for Ireland, Dublin and the Local Area. Data Source: CSO	4-2
Table 4-3 Estimated 2021 Population. Source: CSO	4-2
Table 4-4 Census Population Data for Electoral Divisions in a 500m Distance of the Subject Site. Data Source: CSO	4-2
Table 4-5 CSO Local Area Population Change based on census data	4-2
Table 4-6 CSO Census Data – Local Area Population age groups	4-2
Table 4-7 Labour Force Survey Q3 2019, 2020 and 2021 (Standard methodology).....	4-3
Table 4-8 Comparison between Standard and Covid Adjusted figures	4-3
Table 4-9 Neighbourhood Centres as shown in Figure 4-5.....	4-4
Table 4-10 Health Facilities as shown in figure 4-6.....	4-5
Table 4-11 Parks, Recreational and Sports Facilities as shown in Figure 4-9	4-6
Table 4-12 List of existing facilities within 1km of subject site.....	4-6
Table 4-13 Childcare Facilities within 1km of the subject site.....	4-7
Table 4-14 Schools within 1km Catchment of Subject Site.....	4-9
Table 4-15 Projected Childcare Demand from Proposed Development	4-11
Table 4-16 Breakdown of 2016 Local Population	4-11
Table 4-17 Projected School Aged Population of Development.....	4-11

Chapter 5 Biodiversity

Table 5-1: Examples of criteria used to define the value of ecological features (NRA, 2009a).....	5-3
Table 5-2: Examples of criteria used to define the value of ecological features of local importance.....	5-3
Table 5-3: Categories of Effects (derived EPA, 2017).	5-3
Table 5-4: Definition of magnitude.....	5-3
Table 5-5: Significance of impacts matrix.	5-4
Table 5-6: Surveys carried out on the site.	5-5
Table 5-7 Natura 2000 sites within 15 km of the proposed site.....	5-7
Table 5-8: pNHA sites within 10 km of the proposed site.	5-7
Table 5-9: Fossitt (2000) habitats recorded during ecological walkover survey.	5-9
Table 5-10: Bats recorded during the transect survey carried out on the 7th September 2021.	5-12
Table 5-11: Bat species and counts recorded by the static detector installed within the proposed site during the nights between 7th and 14th September 2021.....	5-12

Table 5-12: Evaluation of parameters based on the guidance "Valuing Bats in Ecological Impact Assessment" (Wray et al., 2010).	5-12
Table 5-13: Summary of results of Brent Goose flight line survey with observations of in-flight over the proposed site.....	5-13
Table 5-14: Invasive Non-native Species within 2 km ² grid squares of the proposed site.	5-14
Table 5-15: Screening of ecological features.	5-14
Table 5-16: Projects granted planning permission since February 2019 in vicinity of the proposed site.....	5-17
Table 5-17: Summary of construction impacts, mitigations and significance of residual impacts.....	5-21
Table 5-18: Summary of operational impacts, mitigations and significance of residual impacts.	5-21

Chapter 8 Noise and Vibration

Table 8.1 Indoor ambient noise levels in dwellings.....	8-1
Table 8.2 Indoor ambient noise levels in non-domestic buildings	8-1
Table 8.3 NRA Maximum Permissible Noise Levels at the Facade of Dwellings during Construction	8-2
Table 8.4 Typical Allowable Vibration during Road Construction in Order to Minimise the Risk of Building Damage	8-3
Table 8.5 Road Traffic Noise – Magnitude of Impact	8-3
Table 8.6 Summary of measured noise levels around the development (free-field data).....	8-3
Table 8.7 Site Suitability Assessment Glazing Requirements	8-4
Table 8.8 Construction Noise Assessment.....	8-5
Table 8.9 Operational Noise Assessment	8-5

Chapter 9 Air and Climate

Table 9-1 Air Quality Standards Regulations 2011 (based on EU Council Directive 2008/50/EC).....	9-3
Table 9-2 Meteorological Data for Dublin Airport 2018-2020.....	9-4
Table 9-3 Trends in Zone A Air Quality - Nitrogen Dioxide (NO ₂)	9-6
Table 9- 4 Trends in Zone A Air Quality – PM ₁₀	9-6
Table 9-5 PM ₁₀ Monitoring Locations.....	9-7
Table 9-6 Trends in Zone A Air Quality - Nitrogen oxide (NO _x)	9-7
Table 9-7 Trends in Zone A Air Quality - (PM 2.5)	9-8
Table 9-8 PM _{2.5} Monitoring Locations.....	9-8
Table 9-9 Trends in Zone A Air Quality - Benzene	9-8
Table 9-10 Trends in Zone A Air Quality - Carbon Monoxide (CO)	9-8
Table 9-11 Assessment Criteria for the Impact of Dust from Construction, with Standard Mitigation in Place....	9-9
Table 9-12 ADDT - Traffic Data used in Air Modelling Assessment	9-10
Table 9-13 Description of Sensitive Receptors	9-11
Table 9-14 Annual Mean NO ₂ Concentrations (µg/m ³).....	9-12
Table 9-15 Daily maximum 1-hour for NO ₂ concentrations (µg/m ³).....	9-12
Table 9-16 Annual Mean PM ₁₀ Concentrations (µg/m ³).....	9-12
Table 9-17 Number of days with PM ₁₀ concentration > 50 µg/m ³	9-12
Table 9-18 Annual Mean NO _x Concentrations (µg/m ³)	9-12
Table 9-19 Annual Mean Benzene Concentrations (µg/m ³)	9-12
Table 9-20 Maximum 8-hour CO Concentrations (mg/m ³).....	9-13
Table 9-21 Regional Air Quality & Climate Assessment.....	9-13
Table 9-22 Summary of Dust Control Techniques	9-15

Chapter 10 Landscape and Visual

Table 10.1: Landscape/Townscape Value and Sensitivity	10-2
---	------

Table 10.2: Magnitude of Landscape/Townscape Impacts 10-3
Table 10.3: Impact Significance Matrix..... 10-3
Table 10.4: Magnitude of Visual Impacts..... 10-4
Table 10.5: Outline Description of Selected Viewshed Reference Points (VRPs) 10-7

Chapter 11 Traffic and Transport

Table 11-1 Statement of Competency 11-1
Table 11-2 Bus Timetables and Routes 11-4
Table 11-3 Percentage Impact Analysis – Construction of Proposed Development 11-6
Table 11-4 Percentage Impact Analysis – Operation of Proposed Development..... 11-7
Table 11-5 Percentage Impact Analysis– 2026 With Development LinSig Analysis 11-7
Table 11-6 Percentage Impact Analysis– 2031 With Development LinSig Analysis 11-7
Table 11-7 Percentage Impact Analysis– 2041 With Development LinSig Analysis 11-7

Chapter 13 Waste

Table 13-1 Estimated on and off-site reuse, recycle and disposal rates for construction waste13-3
Table 13-2 Estimated Waste Generation for the Proposed Development for the Main Waste Types13-4

Chapter 14 Cultural Heritage and Archaeology

Table 14-1 Archaeological features in the vicinity of the study area 14-3

Chapter 15 Interactions

Table 15-1 Interaction Matrix 15-1

LIST OF PLATES

Chapter 14 Cultural Heritage and Archaeology

Plate 14-1 Aerial photograph of the site.....	14-3
Plate 14-2 Looking north over the site with the Swords Rd. visible	14-3
Plate 14-3 Looking east over the site.....	14-4
Plate 14-4 Looking east over the site.....	14-4

1 INTRODUCTION AND METHODOLOGY

1.1 INTRODUCTION

This Environmental Impact Assessment Report (EIAR) has been prepared on behalf of Eastwise Construction Swords Limited to accompany a Strategic Housing Development application to An Bord Pleanála for a new residential development on lands located at 'Hartfield Place', Swords Road, Whitehall, Dublin 9.

The subject site is located within Dublin City Council administrative area. The development site is located along the Swords Road (R132), Dublin 9. The western side of the site fronts onto the Swords Road and the site is accessed from this location. Highfield Hospital is to the immediate south, also fronting onto the Swords Road. There are vacant lands owned by Dublin City Council and Whitehall GAA pitches to the north of the site, facing onto the Swords Road and Collins Avenue. Beech Lawn Nursing home is located to the rear (east) of the site, accessed from Grace Park Road via High Park. The application site includes works to the public road along Swords Road to the west and Grace Park Road to the east.

Ellenfield Park, a 9.34ha/23 acre public park is 400m north of the site. This park consists of a variety of recreational facilities for football, Gaelic football, camogie, and tennis, as well as a children's playground. It is used by a variety of sports clubs such as St. Kevin's Boys Club, and Whitehall Colmcille GAA club and by Holy Child National School for sports.

On the western boundary of the site is the Swords Road, a wide north-south artery into Dublin City which features Quality Bus corridors and part-segregated cycle lanes. Directly across the Swords Road from the subject site is a strip of neighbourhood level mixed-use activities. Similarly, to the north of the site on Collins Avenue, a 5-minute walk, is another neighbourhood level centre for the Whitehall area.

The subject site is located a 15-minute walk from the main campus of Dublin City University, a major centre of higher education and employment in the area. The nearest large-scale retail and services is 20 minutes walking distance to the north west in Santry. The Omni Park Shopping Centre and the neighbouring industrial estate are large scale employers in the area. There was formerly a gatehouse to the south west of the site which was associated with the Manor house that once tied the surrounding lands together but both have since been demolished.

The development will comprise 472 no. residential units within seven urban blocks ranging in height from up to 8 storeys. The development will also include residential amenity facilities, creche, cafe unit, car and cycle parking, private, communal and public open spaces, all associated site development, landscape and boundary works, and services provision. The proposed development is described in the statutory notices as follows:

Eastwise Construction Swords Ltd intend to apply to An Bord Pleanála for permission for a strategic housing development at 'Hartfield Place', Swords Road, Whitehall, Dublin 9. The site is bound to the west by Swords Road, to the south by Highfield Hospital, to the north by vacant land and GAA pitches, and to the east by Beechlawn Nursing Home. To facilitate water services and road infrastructure connections/upgrades the application site red line extends to include a portion of Swords Road (including junctions with Iveragh Road and Collins Avenue), High Park and Grace Park Road (including junctions with Grace Park Heights and Sion Hill Road).

The proposed development will consist of the construction of 7 no. apartment blocks, ranging in height up to 8 storeys (over single level basement). This will provide 472 no. residential units (comprising 32 no. studios, 198 no. 1 beds, 233 no. 2 beds, and 9 no. 3 beds). All with associated private

balconies/terraces to the north/south/east/west elevations. A creche (c.445.76sqm), a café unit (c.99sqm), and internal residential amenity space (c.511sqm), providing a sun lounge, gym, screening room, lounge, and meeting rooms, will also be provided.

The proposed development will include 337 no. car parking spaces, 982 no. cycle parking spaces, and 14 no. motorcycle spaces at basement/surface levels, public open space, and communal open spaces at ground and roof levels.

Vehicular access from Swords Road will be provided with associated works/upgrades to the existing public road layout, junctions, bus lane and footpath network to facilitate same. Two pedestrian/ cyclist only access are provided from the Swords Road as well as a separate pedestrian and cyclist access to the southwest which also facilitates emergency vehicular access.

The application will include for all development works, landscaping, ESB substations, plant areas, bin storage, surface water attenuation, and site services required to facilitate the proposed development. Upgrades to the Irish Water network to facilitate the development are also proposed.

A detailed description of the proposed development is provided in Chapter 3 of this EIAR.

1.2 LEGISLATIVE CONTEXT

Certain public and private projects that are likely to have significant effects on the environment are subject to EIA requirements derived from EIA Directive 85/337/EC (as amended by Council Directive 97/11/EC, Directive 2003/35/EC, Directive 2009/31/EC, Directive 2011/92/EU and Directive 2014/52/EU).

The EIA Directives have been transposed into the Irish land use planning consent system by way of the Planning & Development Acts 2000 (as amended), and the Planning & Development Regulations 2001, as amended.

The most recent amendment to the Regulations - the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018) – transposed Directive 2014/52/EU into Irish law.

Complementary to the legislation is a range of guidelines produced by the EU and government agencies to inform the carrying out of EIA:

- EU Guidance on EIA Screening (DG Environment 2001).
- Guidance on EIA Scoping (DG Environment 2001).
- EIA Review Checklist (DG Environment 2001).
- Guidelines on Information to be Contained in an Environmental Impact Statement (EPA 2002).
- Study on the Assessment of Indirect & Cumulative Impacts as well as Impact Interaction (DG Environment 2002).
- Environmental Impact Assessment (EIA), Guidance for Consent Authorities Regarding Sub-Threshold Development (DoEHLG 2003).
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003).
- Development Management Guidelines (DoEHLG, 2007).
- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2017)
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing

- Systems - Key Issues Consultation Paper (Department of Environment, Community and Local Government, 2017).
- Circular letter PL 1/2017 - Advice on Administrative Provisions in Advance of Transposition (Department of Housing, Planning and Local Government, 2017).
- Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission 2017)
- Environmental Impact Assessment of Projects – Guidance on Screening (European Commission 2017)
- Environmental Impact Assessment of Projects – Guidance on Scoping (European Commission 2017)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018).

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

1.3 DEFINITION OF EIA

Article 1(1)(g) of Directive 2014/52/EU , defines “*Environmental Impact Assessment*” (EIA) as a “*process*” consisting of:

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

Article 171A of the 2018 Regulations defines ‘*environmental impact assessment*’ as “... a process

- (a) consisting of:*
 - (i) the preparation of an environmental impact assessment report by the applicant in accordance with this act and regulations made thereunder,*
 - (ii) the carrying out of consultations in accordance with this Act and regulations made thereunder,*
 - (iii) the examination by the planning authority or the Board, as the case may be, of-*
 - i. the information contained in the environmental impact assessment report,*
 - ii. any supplementary information provided, where necessary, by the applicant in accordance with section 172(1D) and (1E), and*
 - iii. any relevant information received through the consultations carried out pursuant to subparagraph (ii),*
 - (iv) the reasoned conclusion by the planning authority or the Board, as the case may be, on the significant effects on the environment of the proposed development, taking into account the results of the examination carried out pursuant to subparagraph (iii) and, where appropriate, its own supplementary examination, and*
 - (v) the integration of the reasoned conclusion of the planning authority or the Board, as the case may be, into the decision on the proposed development, and*

(b) which includes:

1.4 EIA SCREENING

Section 176(A) of the Act defines ‘screening for environmental impact assessment’ as

- “.. a determination—*
 - (a) as to whether a proposed development would be likely to have significant effects on the environment, and*
 - (b) if the development would be likely to have such effects, that an environmental impact assessment is required.”*

Section 172 of the Act states that an EIA shall be carried out in respect of an application for consent for proposed development where either of the following are relevant:

- (a) the proposed development would be of a class specified in—*
 - (i) Part 1 of Schedule 5 of the Planning and Development Regulations 2001, and either—*
 - I) such development would exceed any relevant quantity, area or other limit specified in that Part, or*
 - II) no quantity, area or other limit is specified in that Part in respect of the development concerned,*
 - or*
 - (ii) Part 2 of Schedule 5 of the Planning and Development Regulations 2001 and either—*
 - I) such development would exceed any relevant quantity, area or other limit specified in that Part, or*
 - II) no quantity, area or other limit is specified in that Part in respect of the development concerned,*
 - or*
 - (b) (i) the proposed development would be of a class specified in Part 2 of Schedule 5 of the Planning and Development Regulations 2001 but does not exceed the relevant quantity, area or other limit specified in that Part, and*
 - (ii) the planning authority or the Board, as the case may be, determines that the proposed development would be likely to have significant effects on the environment*

The subject site does not fall within any development classes set out in Part 1 of Schedule 5.

The following development classes set out in Part 2 of Schedule 5 are noted:

- 10(b)(i) Construction of more than 500 dwellings
- 10(b)(iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere. (In this paragraph, "business district" means a district within a city or town in which the predominant land use is retail or commercial use.)

The gross area of the application site is c. 3.889 ha (including works to public road and infrastructure connection), which is below the 10ha threshold for a built-up area.

The proposed development for 472 no. residential units, which is below the 500 no. units threshold.

Development Class 15 in Part 2 of Schedule 5 is also noted:

- 15 Any project listed in this Part which does not exceed a quantity, area or other limit specified in this Part in respect of the relevant class of development, but which would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7.

Schedule 7 of the Regulations lists the criteria for determining whether Development listed in Part 2 of Schedule 5 should be subject to an EIA. These are:

1. Characteristics of proposed development

The characteristics of proposed development, in particular—

- (a) the size and design of the whole of the proposed development,
- (b) cumulation with other existing development and/or development the subject of a consent for proposed development for the purposes of section 172(1A) (b) of the Act and/or development the subject of any development consent for the purposes of the Environmental Impact Assessment Directive by or under any other enactment,
- (c) the nature of any associated demolition works,
- (d) the use of natural resources, in particular land, soil, water and biodiversity,
- (e) the production of waste,
- (f) pollution and nuisances,
- (g) the risk of major accidents, and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge, and
- (h) the risks to human health (for example, due to water contamination or air pollution).

2. Location of proposed development

The environmental sensitivity of geographical areas likely to be affected by the proposed development, with particular regard to—

- (a) the existing and approved land use,
- (b) the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground,
- (c) the absorption capacity of the natural environment, paying particular attention to the following areas:
 - (i) wetlands, riparian areas, river mouths;
 - (ii) coastal zones and the marine environment;
 - (iii) mountain and forest areas;
 - (iv) nature reserves and parks;
 - (v) areas classified or protected under legislation, including Natura 2000 areas designated pursuant to the Habitats Directive and the Birds Directive and;

(vi) areas in which there has already been a failure to meet the environmental quality standards laid down in legislation of the European Union and relevant to the project, or in which it is considered that there is such a failure

(vii) densely populated areas;

(viii) landscapes and sites of historical, cultural or archaeological significance.

3. Types and characteristics of potential impacts

The likely significant effects on the environment of proposed development in relation to criteria set out under paragraphs 1 and 2, with regard to the impact of the project on the factors specified in paragraph (b)(i)(I) to (V) of the definition of 'environmental impact assessment report' in section 171A of the Act, taking into account—

- (a) the magnitude and spatial extent of the impact (for example, geographical area and size of the population likely to be affected),
- (b) the nature of the impact,
- (c) the transboundary nature of the impact,
- (d) the intensity and complexity of the impact,
- (e) the probability of the impact,
- (f) the expected onset, duration, frequency and reversibility of the impact,
- (g) the cumulation of the impact with the impact of other existing and/or development the subject of a consent for proposed development for the purposes of section 172(1A) (b) of the Act and/or development the subject of any development consent for the purposes of the Environmental Impact Assessment Directive by or under any other enactment, and
- (h) the possibility of effectively reducing the impact.

Notwithstanding that the size of the site and the proposed number of residential units in this instance are below the thresholds set out in Development Class 10 of Part 2 of Schedule 5 of the Planning & Development Regulations; having regard to Development Class 15 and Schedule 7 of the Regulations and to Section 172 of the Act, it was deemed prudent to prepare an EIAR due to the cumulation with other existing development and/or development the subject of a consent for proposed development within the immediate area.

Furthermore, it is noted that under Article 299A of the Regulations, where a planning application for a sub-threshold development is accompanied by an EIAR and a request for a determination under section 7(1)(a)(i)(I) of the Act of 2016 was not made, the application shall be dealt with as if the EIAR had been submitted in accordance with section 172(1) of the Act.

1.5 EIA SCOPING

Section 173(2) (a) of the Planning and Development Act 2000 (as amended) provides that a formal request for scoping may be submitted to the planning authority. However, the 'Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2017), confirm that this is not mandatory.

The EIAR team carried out a scoping exercise to identify the key issues that may be considered likely to have a significant effect on the environment.

In accordance with the draft EPA Guidelines (2017), those issues that do not meet the threshold of significance have been 'scoped out'. The following issues have been identified in the context of the proposed development:

- Population & Human Health
- Biodiversity
- Lands, Soils & Geology

- Hydrology & Water Services
- Noise & Vibration
- Air & Climate
- Landscape & Visual
- Traffic & Transportation
- Material Assets
- Waste Management

1.6 EIAR OBJECTIVES

The EIA process is based on the following four principles:

- *Pursuing Preventative Action*

An assessment of anticipated likely and significant impacts was undertaken during the screening and the considerations of alternatives stages of the EIA process. This involved forming a preliminary opinion with respect to the approximate magnitude and character of the likely environmental impacts. This assessment was based on the knowledge, experience and expertise of the EIA team with reference to EIA guidance material and local information.

- *Maintaining Environmental Focus and Scope*

The EIA process has focussed on those issues where environmental impact is likely to occur and have significant effects.

- *Informing the Decision*

The EIAR has been developed and is presented in such a way as to facilitate the authority decision on the acceptability of the proposed development in the full knowledge of the project's likely significant impacts on the environment, if any.

- *Public & Stakeholder Participation*

Participation is provided through the statutory planning process which allows for public participation and consultation while receiving advice from other key stakeholders and statutory authorities with specific environmental responsibilities.

1.7 EIAR FORMAT & CONTENT

This EIAR is sub divided as follows:

- Environmental Impact Assessment Report
- Appendices to Environmental Impact Assessment Report
- Non-Technical Summary.

The EIAR has been prepared in the Grouped Format as set down in the EPA "Guidelines on Information to be contained in an EIS" (2002) and the 'Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2017). In general, the EIAR follows the framework presented in the EPA "Advice Notes on Current Practice in the Preparation of Environmental Impact Statements" (September 2003).

The structure and responsibility of the EIAR chapters is outlined below:

Chapter	Title	Consultant
1.	Introduction & Methodology	McGill Planning Ltd.
2.	Alternatives	McGill Planning Ltd.

3.	Description of Development	McGill Planning Ltd.
4.	Population & Human Health	McGill Planning Ltd.
5.	Biodiversity	JBA Consulting
6.	Lands, Soils & Geology	Punch Consulting Engineers
7.	Hydrology	Punch Consulting Engineers
8.	Noise & Vibration	Aecom
9.	Air & Climate	Traynor Environmental
10.	Landscape & Visual	Macroworks
11.	Traffic & Transportation	Aecom
12.	Material Assets	McGill Planning Ltd.
13.	Waste Management	Punch Consulting Engineers
14.	Cultural Heritage	John Purcell Archaeology Consultancy
15.	Interactions	McGill Planning Ltd.
16.	Summary of Mitigation Measures	McGill Planning Ltd.

Table 1-1 List of EIAR Chapters

1.8 METHODOLOGY

The preparation of this EIAR requires the co-ordination and synthesis of associated yet diverse elements of the overall assessment. To facilitate this process, a schematic structure is proposed in order to provide a coherent documentation of the varied aspects of the environment considered. The grouped format structure of the Environmental Impact Statement is listed below with a brief outline of each specific stage.

Methodology

The specific approach or techniques used to analyse impacts or describe environments. The terminology set out in Table 3.3 of the EPA 2017 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' will be used where appropriate. This terminology is set out in the table below. The EPA 2017 Guidelines note 'all categories of terms do not need to be used for every effect'.

Quality of Effects It is important to inform the non specialist reader whether an effect is positive, negative or neutral	Positive Effects 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).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/adverse Effects 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).
Describing the Significance of Effects "Significance" is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful	Imperceptible An effect capable of measurement but without significant consequences.
	Not significant An effect which causes noticeable 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

(also see Determining Significance below.).	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 Effects An effect which obliterates sensitive characteristics
Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	Extent Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Describing the Probability of Effects Descriptions of effects should establish how likely it is that the predicted effects will occur – so that the CA can take a view of the balance of risk over advantage when making a decision.	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.
Describing the Duration and Frequency of Effects 'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	Momentary Effects Effects lasting from seconds to minutes
	Brief Effects Effects lasting less than a day
	Temporary Effects Effects lasting less than a year
	Short-term Effects Effects lasting one to seven years.
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years
	Reversible Effects Effects that can be undone, for example through remediation or restoration
	Frequency of Effects Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually

Table 1-2 Description of Effects (Table 3.3 of the EPA 2017 Guidance)

Receiving Environment (Baseline Situation)

Dynamic description of the specific environment into which the proposal will fit, taking account of other developments likely to occur. The context, character, significance and sensitivity of the baseline is described. The likely evolution of baseline environmental characteristics without implementation of the proposed project.

Characteristics of the Proposed Development

Description of the physical characteristics of a project having regard to

- the site location
- the size, design and appearance of the proposed project
- the cumulation with other proposed projects
- the use of natural resources
- the production of waste
- emissions and nuisances
- the potential risk of accidents.

The description of the development should take account of the full 'life-cycle' including construction, commissioning (if relevant), operation, changes to the project and potential decommission.

Potential Impacts

The potential impact of the proposal comprises a general description of the possible types of impacts which proposals of this kind would be likely to produce. Impact assessment addresses direct, indirect, secondary, cumulative, transboundary, short, medium and long term, permanent, temporary, positive and negative effects as well as impact interactions. This includes consideration of a 'Do Nothing' impact which describes the environment as it would be in the future if the development is not carried out.

Mitigation Measures

A description of any specific remedial or reductive measures considered necessary and practicable resulting from the assessment of potential impacts described above.

Predicted Impacts

An assessment of the net specific impact of the proposal, noting the direct, indirect, secondary, cumulative, transboundary, short, medium and long term, permanent, temporary, positive and negative effects as well as impact interactions which the proposed development may have. The predicted impact assumes all mitigation measures are fully and successfully applied. A 'Worst Case' impact is also considered. A 'Worst Case' impact is an impact arising where a development or its mitigation measures substantially fail.

Monitoring

A description of any post development monitoring of effects of the environment which might be necessary.

Reinstatement

A description of any post development reinstatement measures which might be necessary.

1.9 COMPETENCY

For the preparation of this EIAR, the applicant engaged McGill Planning Ltd. to project manage and coordinate the preparation of the EIAR with a team of qualified specialists engaged to prepare individual chapters, as listed in the table below. Details of the competency, qualifications and experience of the authors is also outlined:

Chapter	Consultant	Lead Consultant	Qualifications
Introduction & Methodology	McGill Planning Ltd.	Trevor Sadler	Master of Regional & Urban Planning
Examination of Alternatives			
Description of Development			

Populations & Human Health			
Interactions			
Material Assets			
Summary of Mitigations Measures			
Biodiversity	JBA	Malin Lundberg Patricia Byrne	BSc, MSc BSc (Hons), PhD, MCIEEM
Lands, Soils & Geology	PUNCH Consulting Engineers	Paul Casey	BE (Hons) Bachelor of Civil Engineering from UCD, 2006 CEng – Chartered Engineer with Engineers Ireland, 2016 MIEI – Member of Engineers Ireland
Hydrology and Water Services			
Waste Management			
Traffic & Transportation	AECOM	Patrick McGeough Tim Robinson	MEng, MICE ¹ BSc(Hons), MSc (Engineering), MCIHT ²
Noise and Vibration		Dr. Yuyou Liu	BSc Mechanical Engineering MEng Noise Control Engineering PhD Acoustics Fellow of the Institute of Acoustics (FIOA) Chartered Engineer (CEng)
Air & Climate	Traynor Environmental	Nevin Traynor	BSc. Env, H.Dip I.T, Cert SHWW
Landscape and Visual	Macroworks	Richard Barker	MLA, PGDip Forestry, BA Environmental, Corporate Member ILI
Cultural Heritage	John Purcell Archaeology Consultancy	John Purcell	BA (Hons)

Table 1-3 Competencies of Consultants

Trevor Sadler, who is the director of McGill Planning Limited, has worked for 20 years as a Town Planner in Ireland. He has a masters in Urban and Regional Planning from University College Dublin. McGill Planning Limited, has carried out numerous EIAR's, EIA Screenings and S299B and C assessments. They have also been involved multiple Strategic Housing Developments as well as Strategic Development Zones and regular planning applications over the years. We offer specialist advice on planning and environmental issues.

Malin Lundberg (BSc, MSc), an experienced field ecologist with JBA. Malin has six years' experience of which four are within consultancy. She has prepared Ecological Impact Assessments (EIA) and biodiversity chapters for EIAR for private developers and local authority, including Sandford Living Limited, Kilcock Car Dismantlers and South Dublin County Council.

Patricia Byrne (BSc (Hons), PhD, MCIEEM). Patricia is a Senior Ecologist with 20 years' experience of environmental and ecological work, with the last six years as an ecologist with JBA. She has authored and reviewed numerous

1 MICEI – Member of the Institute of Civil Engineers
2 CIHT – Chartered Institution of Highways and Transportation

ecological assessments under the Habitats Directive; and prepared numerous EIAs for residential developments, biodiversity chapters for EIARs including King's Island Flood Relief Scheme for Limerick County Council.

Paul Casey is a Civil/Structural Engineer with 15 years' experience in civil/structural engineering with significant experience in project and design management. Paul has extensive experience in leading project delivery from concept through planning and construction both in Ireland and abroad. Paul has experience in the design and delivery of multiple highway and bridge projects throughout Ireland including A2 Maydown to City of Derry Airport, M17 Tuam Bypass, N18 Oranmore to Gort and N7 Nenagh to Limerick. Prior to joining PUNCH Consulting Engineers, Paul worked in Sydney, Australia. Some of Paul's high profile international projects include Sydney Trains Network Maintenance Bases (project value €70 million), the Major Works Regional Bases (project value €20 million) and the Sydney Trains new Engineering & Maintenance Hub in Clyde (project value €40 million). Paul joined PUNCH Consulting Engineers in 2016 and was promoted to Technical Director in 2017, followed by his subsequent appointment as Director in 2019. His extensive residential experience (including EIAR Chapter preparation) includes the following successfully granted developments:

- Marmalade Lane, Dundrum (SHD)
- RB Central, Rockbrook, Sandyford (SHD)
- Beach Road Residential Development (SHD)
- Cross Avenue, Blackrock (SHD)
- Abingdon, Shankill (SHD)
- Duleek Housing Development (SHD)
- Ashford Residential Development (SHD)
- Waterford North Quay (SDZ)

Patrick McGeough has been working in the development planning sector for over Four years. His experience is supported by a MEng (Hons) in Civil Engineering. Patrick is involved with all aspects of traffic and transportation projects, including communications with the client and wider design teams, preparation of traffic data (AADT³) for use by other disciplines, undertaking detailed junction modelling analysis using Junctions 9 and LinSig software and preparation and checking of final reports to be issued for planning applications. Relevant project experience includes: Two Oaks Scholarstown SHD, Dublin; Clonburrish SDZ, Dublin; Capdoo SHD, Kildare.

Tim Robinson is a Transport Planner with over 35 years' experience. His experience is supported by a MSc (Engineering) degree in Transport from Imperial College, London. Tim's focus of work has always been in the development planning space, seeking consents for a variety of public and private sector clients. The majority of Tim's work involves transport assessment and traffic & transport input to EIA's. Tim prepares input to numerous such deliverables every year across the island of Ireland. Relevant project experience includes: North South Interconnector, various windfarm projects, as well retail development and mixed use residential development schemes. Tim has lectured to peers on transportation and has been chair of his local branch of CIHT. Tim is an AECOM approved Lead Verifier for Transport Assessment and appraisal projects.

Yuyou Liu is a Chartered Acoustic Engineer with 18 years' consulting and research experience working in UK, Europe and South East Asia. He is a specialist in undertaking environmental noise impact assessments and leads the AECOM acoustics team for London and the South. He has a track record of delivering high quality reports in tight time scales and has undertaken a number of high-profile Environmental Impact Assessments covering construction noise and vibration, industrial noise, road traffic noise and aviation noise.

Nevin Traynor, BSc. Env, H. Dip I.T, Cert SHWW of Traynor Environmental Ltd, is a Senior Environmental consultant and director of the company established in 2004. Traynor Environmental have 17 years' experience as environmental consultants, offering specialist advice in respect of a wide range of environmental disciplines. The

3 AADT – Average Annual Daily Traffic

company are approved environmental noise assessor and have been involved in numerous Strategic housing projects and EIA preparation over the last number of Years.

Richard Barker has spent the last 16 years working as a Landscape Architect in Ireland and has considerable experience in the fields of both Landscape and Visual Impact Assessment (LVIA) and landscape design, covering all stages from project feasibility through to construction. Richard is the Managing Director of Macro Works, a company that specialises in LVIA for over 23 years. Macro Works undertake a broad spectrum of projects from wind and solar energy, to roads and large scale industrial, commercial and infrastructural development. The vast majority of these projects require EIAR and many are also SID projects.

John Purcell graduated with an BA Honours, from UCC in 1997. He has been excavation licence eligible with the DHHG since 2002 and has worked consistently since then in the area of archaeology. Recent Cultural Heritage assessments as part of an EIAR include Howth Demesne (Application currently being finalised). An assessment was undertaken as part of an EIAR for Kilcock Car Dismantlers, Laragh, Co. Kildare (Ref 19/1377). A Cultural Heritage chapter was undertaken for an SHD at Lissywollen, Athlone, Co. Westmeath (Bord Pleanala Ref 305726).

1.10 DIFFICULTIES IN COMPILING THE SPECIFIED INFORMATION

There were no significant difficulties in completing the Environmental Impact Statement. (Any minor difficulties are presented in each of the respective chapters).

While every effort has been made to ensure that the content of this EIAR is consistent there may be instances where typographical errors and/or minor inconsistencies do occur. These are unlikely to have any material impact on the overall findings and assessment contained in this EIAR.

Please note that any red line site boundary shown in this document is for illustrative purposes only. The architect's drawings should be consulted for an accurate red boundary line.

1.11 AVAILABILITY OF THE EIAR

A copy of this EIAR document and Non-Technical Summary of the EIAR document is available for purchase at the offices of Dublin City Council at a fee not exceeding the reasonable cost of reproducing the document.

Additionally, prior to lodging this application, the required information has been issued for the Department of Housing, Planning and Local Government's EIA Portal.

2 ALTERNATIVES CONSIDERED

2.1 TERMS OF REFERENCE

This section of the EIA has been prepared by McGill Planning Ltd and provides a description of the proposed development and also explains the evolution of the scheme design through the reasonable alternatives examined.

It is a requirement of the EIA Directive (as amended) to present a description of the reasonable alternatives considered and a justification of the final proposed development.

2.2 INTRODUCTION

The Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment (2018) state the following:

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

Reasonable alternatives may relate to matters such as project design, technology, location, size and scale.”

This section of the EIA document provides an outline of the main alternatives examined throughout the design and consultation process under the following headings:

- Alternative Locations
- Alternative Uses
- Alternative Designs and Layouts
- Alternative Processes

This serves to indicate the main reasons for choosing the development proposed, taking into account and providing a comparison of the environmental effects. The type of alternatives depends on the nature of the project proposed and the characteristics of the receiving environment.

The 2018 Guidelines also note that it is generally sufficient for the developer to provide a broad description of each main alternative studied and the key environmental issues. Furthermore, a ‘mini- EIA’ is not required for each alternative studied.

2.3 ALTERNATIVE LOCATIONS

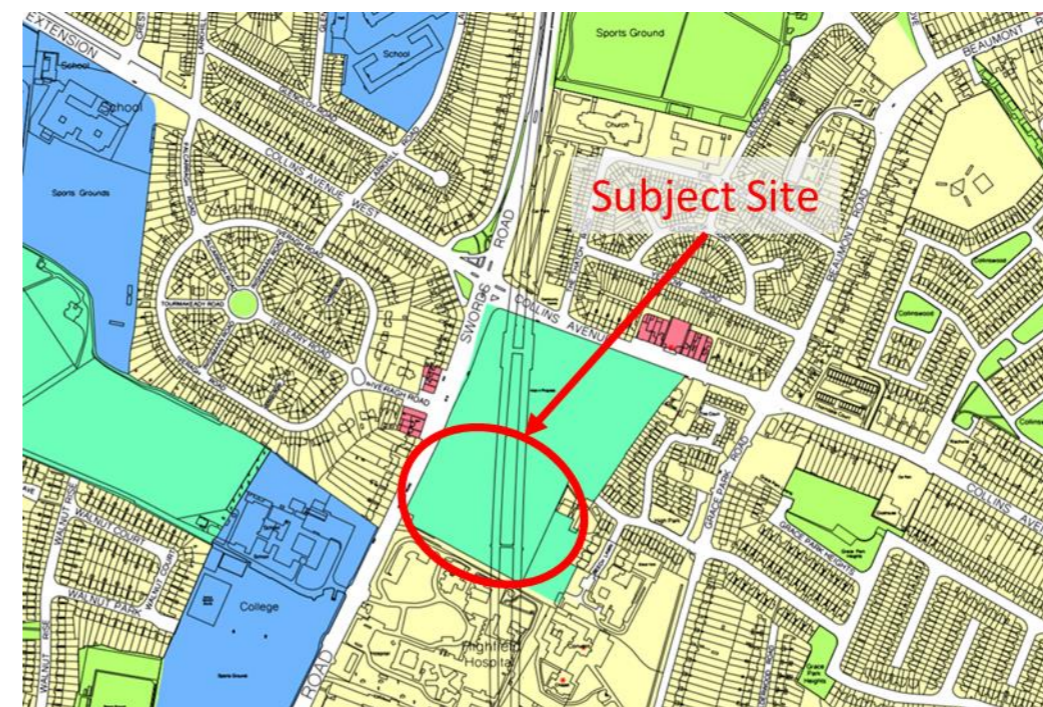
The 2018 Guidelines note that some projects may be “site specific” so the consideration of alternative sites may not be relevant or warranted.

This point is also stated in the Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2017), which states that in some instances alternative locations may not be applicable or available for a specific project which is identified for a specific location. Regarding locations, the consideration

of alternatives in many cases have been addressed and decided at strategic planning level during the adoption of the Dublin City Development Plan 2016-2022.

In this regard, we note that the subject site is located within Dublin City Council administrative area and is zoned Z12 ‘To ensure that existing environmental amenities are protected in the predominantly residential future use of these lands’ in the Dublin City Development Plan 2016-2022. Residential, childcare facility, and shop (local) are all permissible uses on this land use zoning..

The proposed development is therefore considered in accordance with the zoning and other relevant policies and objectives of the Development Plan. As this site is zoned for development within an existing residential area, it was not considered necessary to consider other sites.



Zone Z1	To protect, provide and improve residential amenities	-----	
Zone Z3	To provide for and improve neighbourhood facilities	-----	
Zone Z9	To preserve, provide and improve recreational amenity and open space and green networks	-----	
Zone Z12	To ensure that existing environmental amenities are protected in the predominantly residential future use of these lands	-----	
Zone Z15	To protect and provide for institutional and community uses	---	

Figure 2.1 Site location on Dublin City Development Plan 2016-2022 Zoning Map B

2.4 ALTERNATIVE USES

The proposed development is zoned Z12 in the current City Development Plan (*Dublin City Development Plan 2016-2022*). This zoning permits a range of uses, as listed in the table below. However, we note that the section 14.8.12 of the Development Plan notes that the predominant land-use on Z12 lands to be redeveloped *will be residential and this will be actively encouraged*. Therefore, the proposed residential development with a retail unit and creche is considered the most appropriate land use for the subject site to ensure its development in line with the Development Plan.

Zoning Objective Z12
Permissible Uses
Bed and breakfast, buildings for the health, safety and welfare of the public; caravan park/camp site (holiday), childcare facility , community facility, conference centre, cultural/recreational building and uses, education, embassy residential, enterprise centre, garden centre, golf course and clubhouse, guest house, halting site, home-based economic activity, hostel, hotel, live-work units, media associated uses, medical and related consultants, open space, place of public worship, public service installation, residential institution, residential , restaurant, science and technology-based industry, shop (local) , training centre.
Open for Consideration Uses
Boarding kennel, car park, civic and amenity/ recycling centre, funeral home, industry (light), municipal golf course, nightclub, office, outdoor poster advertising, part off-licence, public house, shop (neighbourhood).

Table 2-1 Permissible Use and Open for Consideration Uses in Z12 zoning

2.5 DO-NOTHING ALTERNATIVE

The subject site has been zoned Z12 since the adoption of the previous *Dublin City Development Plan 2011 – 2017*. Although this zoning permits several uses, as listed in the table above, the only proposals that have come forward for the site have been for residential development. DCC granted permission in 2010 for a residential development comprising 7 no. apartment blocks in heights up to 7 no. storeys. An extension of duration for this permission was subsequently granted until February 2022, which was extended until April 2022 due to Covid-19. Site clearance associated with this permitted development has occurred but as the timeframe for this permission has expired the development cannot be completed.

Therefore, a ‘do-nothing’ alternative would likely result in the subject site remaining vacant and undeveloped. This would mean that these zoned lands would not be developed in accordance with the objectives of the City Development Plan. This in turn would have the knock-on impact of the development plan not being implemented in an appropriate planned manner, creating pressures to develop unzoned, unserved or remote sites that would not support sustainable development. This is not in line with National, Regional or Local plan policies which require the efficient use of zoned land such as these. Furthermore, these lands are considered highly sustainable and suitable for development due to its proximity to a wide range of existing public transport facilities, services and community facilities within the area which are key considerations for the development of any site

2.6 ALTERNATIVE DESIGNS AND LAYOUTS

A key site constraint for the subject site is the location of the Dublin Port Tunnel under the subject site.

Transport Infrastructure Ireland (TII) is responsible for all aspects of operation and safety in Irish Tunnels and are therefore consulted on any development that may impact tunnels. The Dublin Tunnel website notes that no matter the scale of development, ‘The Assessment of Surface and Sub-surface Developments in the Vicinity of the Dublin Port Tunnel’ must be applied to any applications for development. Development on, or near, the port tunnel is constrained by the potential impact to the integrity of the structure of the tunnel.

As a result, any development on the subject site must be carefully designed to ensure there is not a significant impact on the tunnel. The potential for large scale development over the port tunnel route is therefore limited.

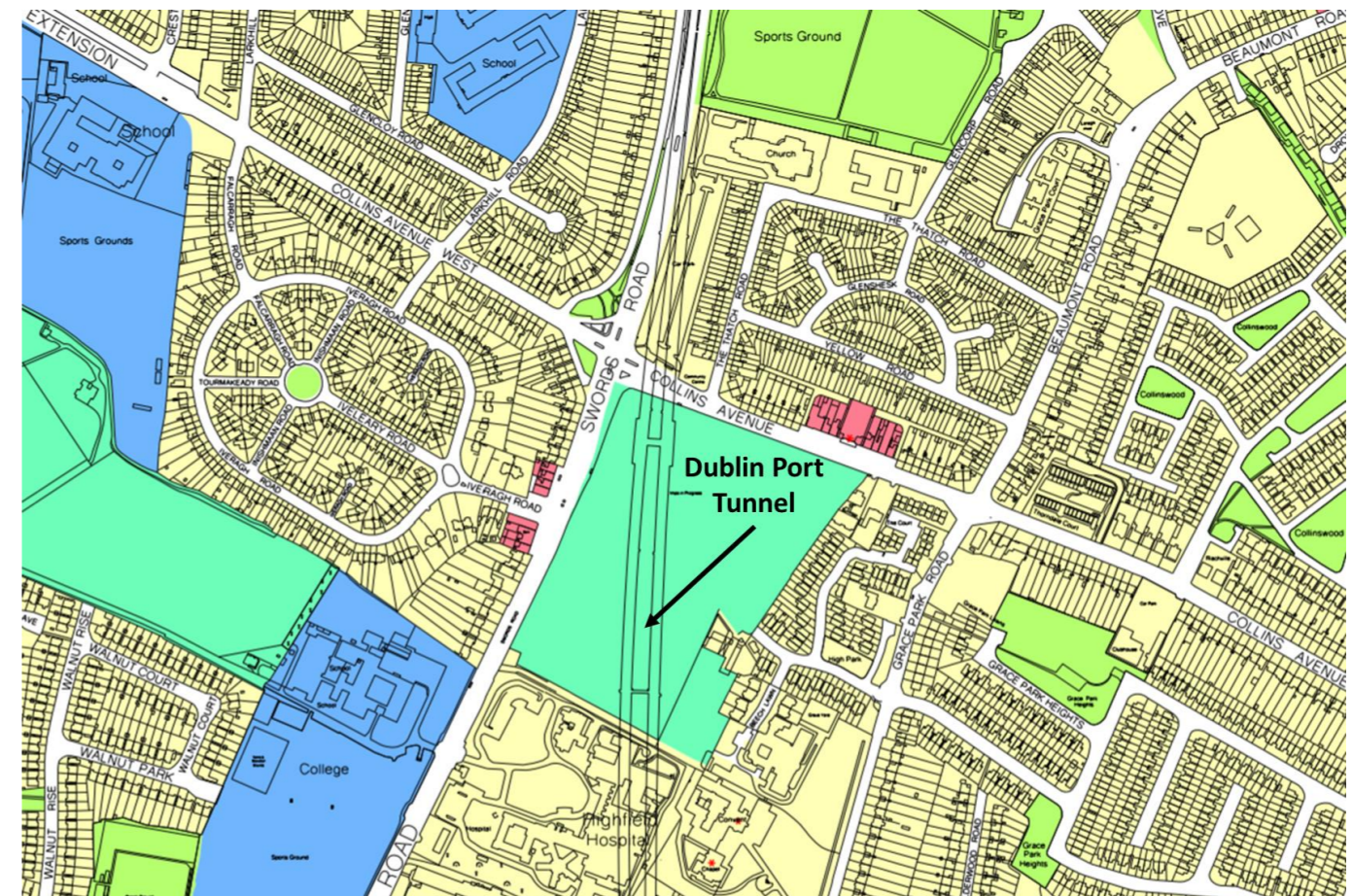


Figure 2.2 Route of Dublin Port Tunnel through subject site (as shown on Development Plan Map B)

The alternative layouts considered have also been guided by the Whitehall Framework Plan for the subject site and the site to the north.

The Whitehall Framework Plan (WFP) was published in 2008 and included a detailed plan and site brief for a site of c. 6.28ha along Swords Road and Collins Avenue, as identified in the figure below. The subject site comprises the southern portion of this WFP site.



Figure 2.3 Whitehall Framework Plan Site Area

The WFP sets out a vision for the site to be a 21st Century Gateway to Dublin City, as a vibrant mixed-use urban development structured by views/vistas and connectivity, highlighted by a series of landmark building. It envisions that the site will provide a new neighbourhood focus within the city with high quality public open space and strong active frontage onto main streets and public domain.

The WFP sets out a strategic layout with urban blocks and public open space positioned through the site to provide a vista which expands through the site from north-west to south-east. The strategic layout provides a strong frontage to Swords Road, Collins Avenue and the open spaces within the site. It also includes for a GAA pitch to the north-east of the site. This GAA pitch is now complete and in operation as part of Whitehall GAA.

The strategic layout set out in this WFP has been designed to take account of the Port Tunnel under the subject site with open spaces provided over the tunnel and the buildings located to either side.

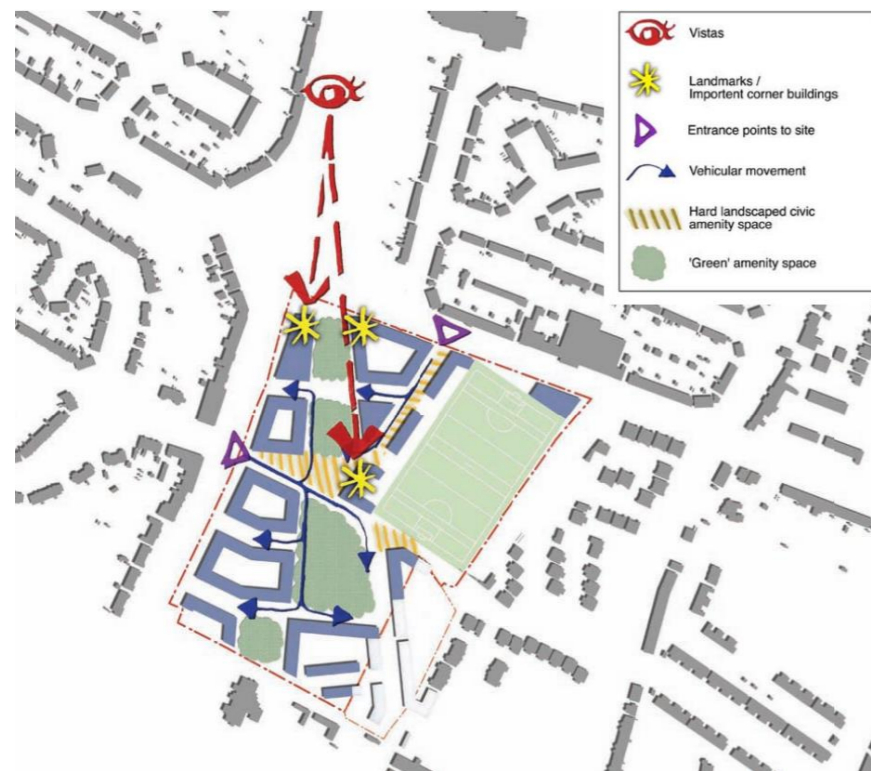


Figure 2.4 Whitehall Framework Plan Vision Layout

The WFP includes a strategic open space provision plan which includes a sensory garden, skateboard park, a MUGA, a playground, and the GAA pitch. In addition, the open spaces consist of green open spaces, shared surfaces and civic spaces. Within the subject site, the WFP includes for a MUGA, playground, and skateboard park.



- Key
- 1 Linear / Sensory Garden: gathering, relaxing, lunch break ...
 - 2 4 Play: Boule, table tennis, Golf / putting ...
 - 3 Skateboard park
 - 5 MUGA, Astro Pitch
 - 6 Playground
 - Civic space / pedestrian strip (hard, landscaped)
 - Shared surface
 - Green open space

Figure 2.5 Whitehall Framework Plan Open Space Strategy

The WFP also outlines a building height strategy which includes heights ranging from 3 to 8+ storeys with the majority of the buildings at 5+ storeys. A landmark building of 8+ storeys is providing in the centre of the site (north of the subject site).



Figure 2.6 Whitehall Plan Height Strategy

Having regard to the Dublin Port Tunnel, the Whitehall Framework Plan, and the context of the surrounding area, each alternative layout examined includes

- Open space provided centrally on the site with the proposed buildings to either side.
- Strong frontages to Swords Road

Alternative Layout A – 2008 Layout (never submitted)

Alternative Layout A consists of a layout that was developed in 2008. This layout comprises 4 no. apartment blocks with 2 no. blocks of duplexes and a creche, to the east of the site.

The layout was developed broadly in accordance with the Whitehall Framework Plan with the public open space provided over the Dublin Port Tunnel to the east of the site.

The four apartment blocks are orientated perpendicular to Swords Road. The two blocks of duplexes are located to the rear of the site, perpendicular to the apartment blocks.

This layout provided vehicular access through the centre of the site with a large circular turning head provided in the eastern corner of the site. It also included pedestrian only routes perpendicular to Swords Road. This layout included an underground car park, accessed from the northern boundary of the site.

This layout provided three areas of public open space – one to the east of the site and then two strips of open space between the apartment blocks. These areas provided a total of c. 0.6ha of public open space, which equates to approximately 21% of the net site area.

This alternative layout included building heights of approximately 2 to 8 storeys.

Environmental Impacts of Alternative A

Alternative A would have an overall have positive impact in terms of providing a high density residential scheme on this accessible site. However, there were several negative impacts which resulted in the movement away from this layout.

The inclusion of the road through the site, adjacent to the public open space, and around to the creche would create a strong presence of cars within the scheme. This is not in line with current national policy which seeks to reduce the dominance of cars within developments and cities and would work against the modal shift towards more sustainable modes of transport.

The inclusion of gates along Swords Road into the paths between the apartment blocks would create a sense of a gated community which would reduce general permeability through the site for pedestrians and cyclists. Again, this would work against the modal shift towards more sustainable modes of transport and would result in a continued over-dependence on cars on this highly accessible site.

The orientation of the apartment blocks results in a broken frontage to Swords Road which reduce the presence of the scheme along this key route into the city centre.

Despite the provision of c. 21% open space on the site, the locations of the open spaces in this layout would result in unusable spaces with the road dissecting the open spaces and the narrow strips between the apartment blocks functioning more as communal open spaces. This would reduce the opportunity for residents and locals to use the open spaces for recreational purposes. The presence of excessive paths and roads through the open spaces would also reduce the landscaping potential for the areas.



Figure 2.7 Alternative Layout A – 2008 Layout

Alternative Layout B – Previously Permitted

Alternative Layout B consists of the previously permitted scheme (DCC Reg. Ref.: 3269/10; ABP Ref: PL 29N.238685) and the associated amendments (DCC Reg. Ref.: 3405/19)

Barina Construction Ltd applied for permission in 2010 for 402 no. apartments within 7 no. apartment blocks in heights up to 8 storeys. The application also included a creche and retail/commercial units. Dublin City Council granted permission for this development in March 2011 subject to 40 no. conditions. The application was subject to a third-party appeal to An Bord Pleanála who subsequently granted permission subject to 26 no. conditions.

The development as initially proposed was amended during the planning process with reduced heights, reduced unit numbers, and improved open spaces. As a result, the granted permission consisted of 358 no. residential units in 7 no. blocks ranging in heights from 4 to 7 storeys and a two-storey self-contained creche building.

The layout of this permitted development was designed broadly in accordance with the Whitehall Framework Plan with the public open space, including a MUGA, provided to the east of the site, over the Port Tunnel, with the buildings provided on either side. The proposal also provides a strong frontage to Swords Road.

This proposal included over 500 no. car parking spaces and just over 400 no. cycle parking spaces. Vehicular access to the site was provided from Swords Road with access to the underground car park provided half way down the public open space.

There are three further applications associated with this permitted development.

- An extension of duration was granted for this development in August 2016 which will expire in April 2022 (DCC Reg. Ref: 3269/10x1).
- An amendment to Block F was permitted in March 2020 (DCC Reg. Ref.: 3405/19) which expires in August 2025.
- An amendment to Block A was applied for by Eastwise Construction Limited. At the time of writing this application was undecided.

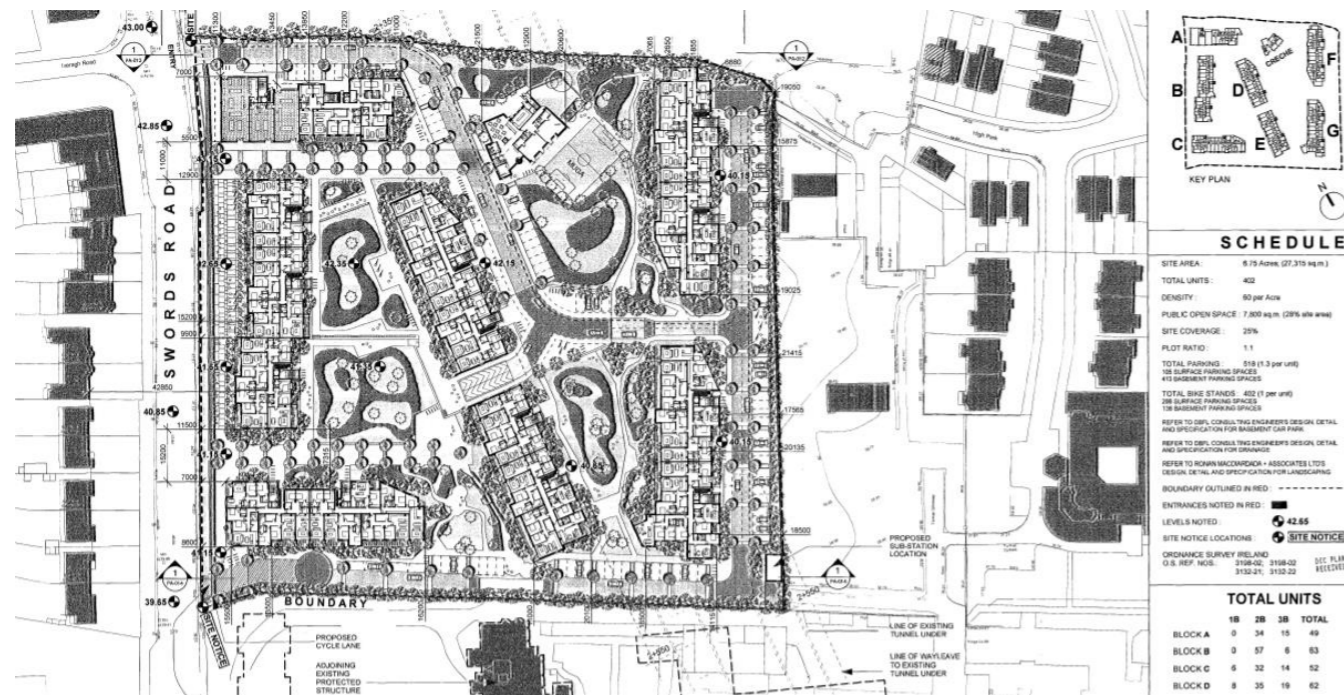


Figure 2.8 Alternative B Layout (DCC Reg Ref 3269/10)

Environmental Impacts of Alternative Layout B

Alternative Layout B would be expected to have an overall positive impact with the provision of a high-density residential development on this sustainable site within Dublin City, in close proximity to existing services and amenities, and located on a key route into the city centre.

However, it is noted that this alternative included a relatively high car parking ratio with c. 1.4 no. car parking spaces provided per unit. This car parking ratio is not in line with current national policy and would contribute to an increased dependency on private cars as a main mode of transport, which would lead to increased greenhouse gas emission, reduced air quality, increased noise pollution, and would promote the sedentary lifestyle associated with car dependency. This is considered unsustainable and unnecessary in this highly accessible site and would have a negative impact on the local environment and population and human health.

In addition, the vehicular access to the basement car parks cuts through the large open space reducing the usability of the public open space for leisure and recreation and therefore reducing the positive impact of providing a public open space. The location of the two storey creche building further reduces the public open space provided.

Alternative Layout C – 2019 Layout (never submitted)

Alternative Layout C comprises a layout developed in 2019 which was never submitted.

This layout includes 6 no. apartment blocks and a central public open space. 5 no. of the apartment blocks are located in positions broadly similar to the previously permitted scheme (alternative B). However, two of the central blocks have been removed to provide one tall, cross-shaped, apartment block which extended up to c. 20 storeys.

This layout includes heights of c. 5 storeys to c. 20 no. storeys, and includes a large public open space to the east of the site over the Port Tunnel. A large public plaza is also provided as part of the public open space.

This layout included vehicular access around the site boundaries with access to an underground car park provided to the north-east of the site.

Environmental Impacts of Alternative C

As with the alternatives A and B, alternative C would have a positive impact in terms of providing a high density residential development on this highly accessible site.

However, the proposed tall apartment block would result in an overly dominant feature in the landscape and would not have a positive visual impact. In addition, an apartment block of up to c. 20 no. storeys would be expensive to build and may result in the development never being completed. As a result, this layout was not pursued or developed further.

It is also noted that the proposed plaza in this alternative reduces the permeable surface area and associated surface water drainage area.



Figure 2.9 Alternative Layout C - 2019 Layout



Figure 2.10 Alternative Layout C – Context Sketch

Alternative Layout D – Previous SHD Scheme (refused)

Alternative Layout D consists of the recent strategic housing development (SHD) application on the site which was refused by An Bord Pleanála in June 2021 (ABP 309608).

Eastwise Construction Limited applied for the SHD application on the site in March 2021. This SHD included 475 no. apartments and one café unit in 7 no. blocks ranging in height from 4 – 8 storeys with a separate two-storey creche building.

The proposed layout of this SHD scheme was similar to the previously permitted scheme on the site (Alternative B) but proposed a relocation of the creche to the west with an additional storey provided on some of the apartment blocks.

This scheme included 348 no. car parking spaces and 527 no. cycle parking spaces. Vehicular access to the site was proposed from Swords Road with the access to the underground car park provided sooner than in Alternative B.

An Bord Pleanála refused planning permission for this scheme due to the requirement for development on lands zoned Z12 to maintain 20% of the site as accessible open space. An Bord Pleanála determined that the design and quantum of the proposed open space was not in line with the development plan.

Environmental Impacts of Alternative Layout D

As with Alternative Layouts A, B and C, Alternative Layout D would be expected to have an overall positive impact with the provision of a high-density residential development on this sustainable site within Dublin City, in close proximity to existing services and amenities, and located on a key route into the city centre

Alternative Layout D includes an improvement on Alternative Layout B with a reduced car parking ratio of c. 0.73 no. car spaces provided per residential unit. This is a more sustainable car parking ratio for this highly accessible site, and would have a reduced impact on air and noise pollution, traffic levels, and human health when compared to Alternative B.



Figure 2.11 Alternative D Layout (ABP 309608 - Previous SHD Submitted and Refused)

Alternative Layout E – Chosen Layout

Alternative Layout E consists of the chosen layout as submitted to An Bord Pleanála for this strategic housing development application.

This chosen layout includes 472 no. units in 7 no. blocks in building heights ranging from up to 8 storeys. This alternative also included a creche, café unit, and residential amenity space. The layout is broadly similar to both the previously permitted scheme (alternative B) and the refused SHD layout (alternative D). However, the creche has been incorporated into Block A which allows the provision of a larger public open space to the east of the site. The locations of the proposed apartment blocks have been slightly adjusted with Blocks F and G provided with a slimmer footprint. In addition, the landscaping of the public open space has been altered to provide larger spaces of uninterrupted open spaces with minimal pathways and hard landscaping provided. This ensures that the requirement for 20% open space on Z12 lands is provided.

This chosen layout provides 337 no. car parking spaces and 982 no. cycle parking spaces (including 14 no. cargo bike spaces).

Environmental Impacts of Alternative Layout C

This alternative provides a car parking ratio of c. 0.66 no. spaces per unit which is a slight decrease on the car parking ratio provided in alternative D and would therefore likely have a slightly increased positive impact on the air quality, noise, traffic, and human health when compared to alternative D. In addition, this alternative provides increased cycle parking spaces which will help encourage a modal shift to cycling as a form of transport, further decreasing air and noise pollution and improving human health.

The redesigned public open space includes increased areas of soft landscaping, a MUGA, and play areas which will have a positive impact on biodiversity, and the population and human health. The open space and play areas will provide high quality recreational space for both the future residents of the proposed development and the existing residents in the wider area. In addition, the reduced quantum of hard landscaping will provide increased habitats for flora and fauna.



Figure 2.12 Alternative E Layout (Chosen Layout)

Criteria/Justification for Selecting Chosen Layout and Design

It is evident from the above that there has been a progressive evolution of design alternatives, in the context of the site constraints, the Whitehall Framework Plan, and the previously approved scheme, to arrive at the current proposal.

- The chosen layout is an efficient use of space, providing a high-density residential development with large areas of public and communal open spaces.
- The provision of a reduced car parking ratio reflects the site's well-connected location
- The provision of the retail unit and creche will help to create a sustainable development with services and amenities provided within the scheme.
- The layout will provide a strong frontage to Swords Road, the proposed public open space and the communal open spaces.

Overall, the chosen layout provides a high-quality scheme that will add to the housing supply in the area.

2.7 ALTERNATIVE PROCESSES

The subject site is zoned Z12 which includes a range of permissible uses, as outlined in section 2.4. Many of these permissible uses would result in alternative processes on the site, such as enterprise centre, place of public worship, education, and public service installation. However, as discussed in section 2.4, the proposed residential, retail and childcare uses are considered the most appropriate uses for the subject site. This residential use is in line with the Development Plan and the previous permitted development on the site. The inclusion of the retail unit and childcare facility are complementary uses to the residential element and are therefore also in accordance with the Development Plan. Therefore, it is not considered appropriate to assess other processes in the context of the EIAR.

2.8 SUMMARY TABLE OF ALTERNATIVE DESIGNS AND ENVIRONMENTAL IMPACTS

A comparison of the environmental effects of each of these alternative layouts is shown in table 2.1 below. This table compares the operational effects of each alternative on a variety of environmental factors. Each option is compared to the others and are assessed as follows:

- ✓ Is for those that are considered to have a more positive impact than others
- = Where the impact is considered similar for all options
- X Where a particular option is considered to have a more negative impact on a particular aspect of the environment compared to the majority of the others.

It is considered that the chosen design as per this planning application and EIAR in general achieves a better result in terms of impact on the environment than the other design options previously considered.

	A	B	C	D	E (Chosen Layout)
Population and Human Health	X	X	X	X	✓
Biodiversity	X	=	X	=	✓

Soils and Geology	=	=	=	=	=
Hydrology	X	=	X	=	✓
Air and Climate	X	X	=	=	✓
Noise and Vibration	X	X	=	=	✓
Traffic	X	X	=	=	✓
Waste	=	=	=	=	=
Material Assets	=	=	=	=	=

Table 2-2 Comparison of Effects

The subject site and the proposed development have been subject to a long and detailed design process that has evolved from the initial proposal in the 2010 to the current proposal. The alternative layouts examined here have had regard to the location of the Port Tunnel under the site, the Whitehall Framework Plan and the urban context of the site within Dublin City. As a result, each alternative layout included

- Seven apartment blocks
- A large public open space located over the Port Tunnel
- Vehicular access from Swords Road

This has resulted in a relatively similar environmental impact from each of the alternative layouts. However, the overall environmental impact of each alternative is positive. Each alternative would result in the development of this zoned, serviced site, within Dublin City, within close proximity to existing public transport options, services, and amenity areas.

The chosen layout provides a strong urban edge to Swords Road, the proposed public and communal open spaces. This chosen layout will create a strong sense of place, improve legibility and permeability, and create a new landmark public open space including a MUGA at this key site in the area. The higher density achieved in the chosen layout ensures that the proposed development is in accordance with the most recent national and regional policies for compact growth.

In terms of traffic, noise and vibration, air and climate, it is noted that the key benefit of the chosen layout is the reduced car parking ratio proposed when compared to the previously permitted scheme. This will have a positive knock-on impact with reduced emissions, noise pollution, and vehicular traffic when compared to the permitted scheme with a higher car parking ratio.

In terms of population and human health, it is noted that the key benefit is the increased recreational spaces which will help contribute to the creation of a community within the development, and the reduced emissions and pollutions associated with the reduced car parking ratio. This will have a positive impact on population and human health.

In terms of biodiversity, it is noted that the key benefit of the chosen layout is the increased areas of soft landscaping with reduced areas of hard landscaping.

2.9 REFERENCES

Dublin Tunnel (2022), *Development (Construction) over Dublin Tunnel*. Available at: <https://dublintunnel.ie/planning-above-tunnel/>

3 DESCRIPTION OF DEVELOPMENT

3.1 INTRODUCTION

This section of the EIAR has been prepared by McGill Planning Ltd. with input from the project design team. The section describes the nature of the proposed development in accordance with the requirements of the relevant EIA legislation and guidance on preparation and content of EIAR.

3.2 CHARACTERISTICS OF THE SITE

The subject site has a gross site area of c. 3.889ha which includes works along Swords Road. The net site area is c. 2.734ha. The main site is a rectangular shape which is currently vacant. Permission for a housing development was granted in 2010 (DCC Reg. Ref.: 3269/10). Some site clearance and initial construction works have taken place on site for this permission. However, the permission will expire in April 2022.

There is very little vegetation on site. The development site is located along the Swords Road (R132), Dublin 9. The western side of the site fronts onto the Swords Road and the site is accessed from this location. Highfield Hospital is to the immediate south, also fronting onto the Swords Road. There are vacant lands owned by Dublin City Council and Whitehall GAA pitches to the north of the site, facing onto the Swords Road and Collins Avenue. Beech Lawn Nursing home is located to the rear (east) of the site, accessed from Grace Park Road via High Park.

The site is free from any protected structures or monuments, and it is not located within a Conservation Area or an Architectural Conversation Area. The site is not within a Special Area of Conservation (SAC) or a Special Protection Area (SPA). The site is not designated for any nature conservation purposes and there are no habitats of conservation importance recorded within the site. There are no Natura 2000 sites located either within or directly adjacent to the lands. The AA Screening notes that there are six Natura 2000 sites within 15km that are potentially at risk from pollution via a hydrological connection and nine Natura 2000 sites within 10km that are potentially at risk from air pollution.

The Dublin Port Tunnel runs beneath a portion of the subject site. The site formed part of the accommodation works for the construction of the Dublin Port Tunnel and the tunnel is located beneath the site on a line north/south.

The subject site is located within Dublin City Council administrative area and is zoned Z12 which has the objective *"To ensure that existing environmental amenities are protected in the predominantly residential future use of these lands."*



Figure 3-1: Site Location (Source: Google Maps, 2022)

3.3 PROPOSED DEVELOPMENT

The proposed development consists of a strategic housing development which is described in the statutory notices as follows:

Eastwise Construction Swords Ltd intend to apply to An Bord Pleanála for permission for a strategic housing development at 'Hartfield Place', Swords Road, Whitehall, Dublin 9. The site is bound to the west by Swords Road, to the south by Highfield Hospital, to the north by vacant land and GAA pitches, and to the east by Beechlawn Nursing Home. To facilitate water services and road infrastructure connections/upgrades the application site red line extends to include a portion of Swords Road (including junctions with Iveragh Road and Collins Avenue), High Park and Grace Park Road (including junctions with Grace Park Heights and Sion Hill Road).

The proposed development will consist of the construction of 7 no. apartment blocks, ranging in height up to 8 storeys (over single level basement). This will provide 472 no. residential units (comprising 32 no. studios, 198 no. 1 beds, 233 no. 2 beds, and 9 no. 3 beds). All with associated private balconies/terraces to the north/south/east/west elevations. A creche (c.445.76sqm), a café unit (c.99sqm), and internal residential amenity space (c.511sqm), providing a sun lounge, gym, screening room, lounge, and meeting rooms, will also be provided.

The proposed development will include 337 no. car parking spaces, 982 no. cycle parking spaces, and 14 no. motorcycle spaces at basement/surface levels, public open space, and communal open spaces at ground and roof levels.

Vehicular access from Swords Road will be provided with associated works/upgrades to the existing public road layout, junctions, bus lane and footpath network to facilitate same. Two pedestrian/ cyclist only access are provided from the Swords Road as well as a separate pedestrian and cyclist access to the southwest which also facilitates emergency vehicular access.

The application will include for all development works, landscaping, ESB substations, plant areas, bin storage, surface water attenuation, and site services required to facilitate the proposed development. Upgrades to the Irish Water network to facilitate the development are also proposed.

Residential

The proposed development provides 472 no. residential units as follows:

- 32 no. studios
- 198 no. 1 beds
- 233 no. 2 beds
- 9 no. 3 beds

The 472 no. units provide a residential density of 162.64 uph. The units will be provided in seven urban blocks, comprising of seven apartment blocks ranging in height up to 8 storeys over a single level basement. The table below provides an overview of the units provided in each block and the building heights proposed. All of these units will have associated private open space in the form of terraces or balconies which will look east/ west/ north/ south. 55.6% of the proposed units are dual aspect.

Block	Total Units	Height
Block A	56 no.	5-8 no. storeys
Block B	78 no.	5-6 no. storeys
Block C	54 no.	4-6 no. storeys
Block D	76 no.	7-8 no. storeys
Block E	58 no.	1-8 no. storeys
Block F	76 no.	5-6 no. storeys
Block G	74 no.	4-6 no. storeys

Table 3-1 Proposed Apartment Blocks - Unit Numbers and Heights

Additional Facilities

In addition to residential units, the proposed development also provides a café (c. 99sqm) and a creche (c. 445.76sqm) which are located on the ground floor of Block A. An outdoor play area of c. 118sqm is provided for the creche. These will serve both the proposed development and the wider area.

Communal Facilities

The proposal includes a total of c. 511sqm indoor communal amenity space for the all future residents of the development within Block A:

- The amenity space on the ground floor will provide a reception, meeting rooms, resident’s lounge, and a screening rom.
- A residents gym is provided at basement level.
- An amenity space on the sixth floor provides a sun lounge.

The proposal also includes three communal roof terraces – on Block A, Block F and Block G – and a large communal open space at surface level west of Blocks D and E.

Site Development Works

All other associated site development works, drainage and infrastructural works, servicing (including substations, plant, bin stores), landscaping, open spaces, and boundary treatment works.

Layout and Design

The proposed development consists of seven apartment blocks.

Block A is located in the northern corner of the site and provides frontage to both Swords Road and the northern access road into the site. The block is orientated in a broadly west-east direction. The block steps up from 5 no. storeys at the western elevation along Swords Road to 8 no. storeys at the south-eastern elevation. The ground floor of this blocks provides communal amenity space and a creche and as such will provide activity to the streets and public open spaces. An indoor sun lounge and a roof terrace are provided at sixth floor level for the residents. A residents gym is provided in the basement.

Block B is located south of block A, along Swords Road, and continues the frontage along Swords Road. It is orientated in a northeast-southwest direction, perpendicular to Block A. The block helps frame the communal open space to the east of the block. The block steps up from 5 storeys at either end of the block to 6 storeys and steps down again to 5 storeys in the centre of the block. This variation in height provides a strong frontage to Swords Road to the west and the communal open space to the east while also ensuring the elevation does not become monotonous.

Block C is located to the south of the site, south of Block B, and continues the frontage along Swords Road. It also provides frontage to the southern access road to the site. The block is orientated in a northwest-southeast direction, perpendicular to Block B, and provides frames the communal open space north of the block. The block steps up from 5 storeys along Swords Road to six storeys and steps down to 4 storeys on the eastern elevation.

Block D and Block E are located centrally within the site and are orientated in a north-south direction. The blocks provide frontage and passive surveillance to the communal open space to the west and the public open space to the east. Block D is generally 8 storeys in height and steps down to 7 storeys at the northern and southern elevations. Block E steps up from 4 storeys at its southern elevation to 8 storeys and then down to 7 storeys at its northern elevation. There is stair core and lift located adjacent to the southern elevation of Block E which provides access to the basement car park.

Block F and G are located along the south-eastern boundary of the site and are orientated in a northeast-southwest direction. They provide frontage and passive surveillance to the public open space to the west of the blocks. Block F steps up from 4 storeys at the northern elevation to 5 storeys. Block G steps up from 4 no. storeys at its southern elevation to 6 no. storeys. A roof terrace providing communal open space for the apartment blocks is located in the south-western corner of both blocks (at fifth floor level in Block F and at fourth floor level in Block G).

The proposal includes one basement located under Blocks A, B, C, D and E and under the communal open space.

A total of c. 9,445sqm open space is provided within the development as public/communal open space. This equates to c. 34.54% the net site area.

The proposal includes a total of c. 6,165sqm public open space. This equates to c. 22.55%.

- A large public open space is provided to the west of the site, framed by Blocks D, E, F, and G. This public open space provides large kick about areas, a multi-use games area (MUGA), gym equipment, and children’s play equipment.
- A public plaza is provided in the northern corner of the site, adjacent to Block A.

The proposal includes a total of c. 3,279.86sqm of communal outdoor amenity space for the residents.

- Roof terraces on Block A, Block F, and Block G.
- A large communal open space at ground floor level, framed by Blocks B, C, D and E. This communal open space provides a play area, seating, and passive amenity areas.

The communal open spaces will be clearly defined and distinguishable from private and public open space.

Each apartment/duplex is also provided with a private balcony or terrace in accordance with current standards. The terraces are clearly defined as private spaces through hard and soft landscaping.

Access and Parking

There are four access points into the site from Swords Road. One main vehicular access at the northern corner, two pedestrian accesses between the blocks, and a cyclist/pedestrian access at the southern corner which will also serve as an emergency/maintenance vehicular access when required.

The access at the southern corner of the site will be generally pedestrian and cyclist access only. This will be managed by the use of bollards which can be removed to provide fire tender/maintenance access if required. A fire tender access route is provided along the site boundaries and through the public open space. The landscaping in the public open spaces has been carefully designed to ensure it is accessible for fire tender without detracting from the quality of the public open space.

The access at the northern corner of the site provides vehicular access to the site. The basement access is provided on the eastern side of Block A which ensures that most vehicles have immediate access to the basement. This limits the presence of cars on the remainder of the site resulting in a predominately pedestrianised site. Vehicles can continue along the street proposed around the site boundaries which provides access to surface car parking and for bin collections. Turning heads are provided along this street to allow vehicles, including refuse trucks, to manoeuvre and turn around to exit at the access point Swords Road at the northern corner of the site.

It is intended that the internal street along the site boundaries will operate as a shared surface/homezone to provide priority for pedestrians through the site which will be aided by the lack of a through route and the limited surface car parking provided along the street. The shared surface/homezone will be distinguished by the surface treatment and a narrowed width.

The proposed development includes a total of 337 no. car parking spaces. Car parking is provided primarily at basement level with 277 no. spaces at basement level and 60 no. spaces at surface level. 279 no. spaces are allocated for residents in the basement and 5 no. spaces are allocated for the creche staff in the basement. The proposal includes 10% electric vehicle charging spaces and 22 no. accessible parking spaces (18 no. at basement and 4 no. at surface). 14 no. motorcycle spaces are provided at basement level.

The proposal includes a total of 982 no. cycle parking spaces. 732 no. are provided at basement level and 236 no. are provided at surface level. In addition, 14 no. cargo bike spaces are provided.

3.4 CONSTRUCTION STAGE

This section of the EIAR summarises the construction of the proposed development. The Construction and Environmental Management Plan submitted separately in the planning application, and the Resource and Waste Management Plan should also be consulted.

Hoarding, Site Set-Up and Formation of Site Access/Egress

The site area will be enclosed with hoarding, details of which will be agreed with Dublin City Council. This will involve erecting hoarding around the proposed site perimeter in line with the finished development extents. Hoarding panels will be maintained and kept clean for the duration of the works.

The available site footprint will allow the site compound to be set up within the site boundary. The site compound will be used for the main offices and welfare facilities. Further details of the parking and compound are provided in the CEMP. The exact location of the construction compound will be confirmed in advance of commencement of the works (and agreed with Dublin City Council).

The Contractor will be responsible for the security of the site. The Contractor will be required to:

- Install adequate site hoarding to the site boundary;
- Maintain site security at all times;
- Separate public pedestrian access from construction vehicular traffic.

As with the other construction activities that are being carried out within the Dublin City Council local authority area, activities associated with the construction compounds will be subject to restrictions to the nature and timing of operations so that they do not cause undue disturbance to neighbouring areas and communities.

Site Clearance

Site clearance works associated with the permitted development (DCC Reg. Ref.: 3269/10) have already occurred on site.

The construction of the proposed basement will require the removal of existing soil and any remaining vegetation on site. It is noted there is minimal vegetation on site.

A Construction and Environmental Management Plan has been prepared and submitted with this application and will guide the site clearance.

Car Parking Arrangements

Parking of construction workers vehicles will be limited to the site. To minimise congestion, a Construction Traffic Management Plan has been prepared by AECOM and submitted with this application. The CTMP incorporates the mitigation measures outlined in Chapter 11 of this EIAR.

Working Hours

The proposed hours of work on site will typically be 08:00 hrs to 19:00 hrs Monday to Friday and 08:00 hrs to 14:00 on Saturdays unless otherwise specified by planning conditions. No working will be allowed on Sundays and Public Holidays. Certain tasks may need to be undertaken outside of these hours. All outside of hours work will first be agreed in writing with the Local Authority.

Lighting

Appropriate lighting will be provided as necessary at construction compounds. All lighting will be installed so as to minimise light spillage from the site. All construction lighting will be turned off each evening and at weekends to reduce the potential impact on local bat populations.

Delivery and Storage

The Contractor will ensure that the delivery of materials is coordinated to minimise impacts to adjacent properties. The Contractor will ensure that all materials are adequately stored and secured in the site compound and in the two areas identified for material storage in the CEMP. The Contractor will ensure the roads adjacent to the site are kept clean and free of debris. The contractor will ensure that all mitigation measures in relation to delivery and storage outlined in the CEMP and this EIAR will be adhered to.

Traffic Management Procedures/Generation

A Construction Traffic Management Plan (CTMP) has been prepared and is submitted with this application. The contractor will be responsible for the implementation of all mitigation measures as outlined in the CTMP and Chapter 11 of this EIAR, and for all agreements between the developer and City Council with the objective that the transportation needs for the proposed development will have a minimal impact on the road network and local communities.

Disposal of Water, Wastewater and Sewage

All site facilities during construction will be located entirely within the site. The construction compound will include adequate welfare facilities including foul drainage and potable water supply.

Throughout the works, all surface water (water from excavations etc.) 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.

Air Quality

There is the potential for a number of emissions to the atmosphere during the construction stage of the project. In particular, activities may generate quantities of dust. Construction vehicles, generators etc., will also give rise to some exhaust emissions. Vehicular movements to and from the site will make use of existing roads.

The potential for dust to be emitted depends on the type of activity being carried out in conjunction with environmental factors including levels of rainfall, wind speeds and wind direction. The potential for impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. The majority of any dust produced will be deposited close to the potential source and any impacts from dust deposition will typically be within several hundred metres of the construction area.

In order to ensure that no dust nuisance occurs, a series of measures are proposed under the Chapter 9, the Dust Management Plan in Appendix 9.3 and the CEMP accompanying the application. Hard surface roads shall be swept to remove mud and aggregate materials from their surface. Furthermore, where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser. Vehicles delivering material with dust potential both on and off the site shall be covered with tarpaulin to ensure minimise dust emissions.

All vehicles exiting the site shall make use of a wheel wash facility, if required, prior to entering onto public roads, to ensure mud and other wastes are not tracked onto public roads. Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.

The dust management plan shall be implemented as outlined in Chapter 9 and Appendix 9.3 of this EIAR and reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust.

Further information on the dust minimisation plan is included in Chapter 9.

3.5 OPERATIONAL STAGE

The proposed development is a residential development on appropriately zoned lands at Swords Road, Whitehall, Dublin 9. The development will provide residential units, a creche, café unit, residential amenity spaces, and associated infrastructural works, connections and open spaces.

It is anticipated that the primary direct significant environmental effects will arise during the construction stage. Once the development is completed, and mitigation measures employed, it is expected to operate without creating any significant additional environmental impacts. The range of anticipated activities, materials/natural resources used, effects/emissions are not expected to result in a significant impact on the constituent environmental factors.

The primary likely and significant environmental impacts of the operation of the proposed development are fully addressed in the EIAR document; and relate to Population and Human Health, Landscape and Visual Impact and Noise and Air impacts associated with the traffic generated. There is potential for limited cumulative, secondary and indirect impacts (for instance traffic). However, any identified cumulative impacts are unlikely to be significant and have been addressed in the EIAR.

The proposed development at operational stage will be predominantly a residential development with a small local shop and a creche. The expected use of energy and water would be in line with normal household uses. This is the same situation for smaller local/ neighbourhood shop facilities and creche operation. There is no single use proposed that has an excessive or unusual demand in terms of energy and water as a result of this development. Once the development is completed and is operational there will be no additional uses of the material or natural resources such as land or soil. The biodiversity of the site will be improved due to the new landscaping proposed as part of the development.

3.6 CHANGES, SECONDARY DEVELOPMENTS, CUMULATIVE IMPACTS

The potential for the specific proposed development as described to grow is considered to be limited within the residential area. The potential for the apartments to expand or increase in scale is limited to the confines of the permission sought and new planning permission will be required for further extensions to the blocks. The potential for increased retail, commercial or community uses within the blocks would be subject to further planning permissions.

The subject site is located within the Whitehall Framework Plan (2008) area which contains the subject site and the site to the immediate north. Part of the site to the north has been developed as a GAA pitch, as outlined in the Framework Plan. It is understood that the remainder of the site to the north is under the ownership of Dublin City Council and that the design process for an application on the site is underway. There will be potential for cumulative impact with any development on this site to the north and the proposed development. This will be assessed as necessary throughout the EIAR.



Figure 3-2 Whitehall Framework Plan site area

The wider area is a well-established neighbourhood in Dublin, with limited potential for redevelopment. As a result, there have been no significant applications for residential development granted within 1km of the subject site. It is noted that An Bord Pleanála granted permission in 2019, under ABP 303358, for 110 no. residential units located c. 1.7km north of the subject site. However, it is considered that any cumulative impact resulting from the proposed development with this permitted SHD scheme will be imperceptible. It is also noted that any future planning applications relating to the proposed development, the site to the north, or the surrounding area will be assessed separately and are outside the scope of this EIAR.

4 POPULATION AND HUMAN HEALTH

4.1 INTRODUCTION

This chapter, prepared by McGill Planning Ltd., addresses the impacts of the proposed strategic housing development on population and human health.

4.2 METHODOLOGY

To establish the existing receiving environment/baseline for the subject site, the methodology included site visits to evaluate the location and likely significant potential impact upon the human sources in the area. Desk based study included an analysis of the Central Statistics Office Census (CSO) data, the ESRI Quarterly Economic Commentary, and national, regional and local planning policy, school and creche enrolment figures.

Different local catchment areas were established for analysing population data, creche demand and capacity, and school demand and capacity. These areas were chosen to gather the most relevant data for each factor. A general local catchment area of 1km from the subject site forms the basis of most areas of analysis.

4.3 RECEIVING ENVIRONMENT

Population

For the purpose of this population analysis a local catchment area was selected to include the Electoral Divisions (EDs) within 1km of the subject site. This area is shown in *figure 4-1* and will be referred to as the Local Area. The EDs were chosen as a basis of analysis as, unlike the Small Area boundaries, the ED boundaries have remained unchanged and therefore can be used to compare population changes over time.

The subject site is located within the Whitehall D Electoral Division (ED). Seven ED's border Whitehall D ED which are Whitehall A and Whitehall B to the west of the subject site, Beaumont F and Grace Park to the east, Beaumont A to the north and Drumcondra South A and Drumcondra South C to the south. The total study area for this population analysis includes eight electoral divisions, which will be referred to throughout this section as the Local Area.

Electoral Divisions	2011 Population	2016 Population	Percentage Change
Whitehall D	2,885	3,456	19.79% increase
Whitehall A	3,545	3,286	7.31% decrease
Whitehall B	3,892	4,128	6.06% increase
Beaumont F	3,437	3,590	4.45% increase
Grace Park	5,670	5,806	2.40% increase
Beaumont A	2,467	2,463	0.16% decrease
Drumcondra South A	4,571	5,064	10.79% increase
Drumcondra South C	3,191	3,517	10.22% increase
Total	29,658	31,310	5.57% increase

Table 4-1 Census Population Data for Electoral Divisions in chosen catchment area (1km Distance). Data Source: CSO



Figure 4-1 Electoral Divisions within 1km and 500m of Subject Site

Combined these eight EDs had a population of 31,310 in 2016, an increase of 5.6% on the 2011 population. This is a similar population increase compared to the national average, Leinster and Dublin. The census data shows that the population of Ireland increased by 3.8% from 2011 and 2016 to a total population of 4,761,865. Leinster and Dublin both experienced a higher population growth than the national average (5.2% and 5.8% respectively).

These statistics are somewhat outdated, and a new census is due to take place in February to May of this year (2022). The CSO provided an estimation of the population in April 2021. This indicated that the country's total population was likely c. 5,011,500 and that the Dublin population was c. 1,426,000 which accounts for 28.5% of the total population of the country. This CSO data estimates that the population of Ireland in 2021 is the highest it has been since 1851. The 2016 population for the local area was 2.3% of the total census 2016 Dublin population figure. Assuming this proportion remained the same in 2021, the local area's population in 2021 was likely c. 32,798 which was calculated by retrieving 2.3% of the estimated CSO 2021 population figure for Dublin. These estimations indicate that the state, county and local area populations are continuing to increase. For further analysis we have estimated the local area population by observing local area trends. The local area population has increased by 5.6% from 2011 to 2016. Assuming this trend remains the same it can be estimated that the population of the local area is c. 32,969 in 2021.

Area	2011	2016	% Change 2011-2016
Ireland	4,588,252	4,761,865	3.8%
Leinster	2,504,814	2,634,403	5.2%
Dublin	1,273,069	1,347,359	5.8%
Local Area	29,658	31,310	5.6%

Table 4-2 2011 and 2016 Census Data for Ireland, Dublin and the Local Area. Data Source: CSO

Area	Estimated 2021 Pop	% Change 2016-2021
Ireland	5,011,500	5.2%
Dublin	1,426,000	5.8%
Local Area (2.3% of Dublin's estimated population) *Calculated by finding 2.3% of Dublin's estimated 2021 population (1,426,000*0.023)	32,798*	4.8%
Local Area within 1km (5.6% increase on 2016)	32,969	5.6%
Local Area within 500m (4.3% increase on 2016)	21,138	4.3%

Table 4-3 Estimated 2021 Population. Source: CSO

To ensure data is not skewed by outliers a 500-metre buffer distance from the subject site was observed in relation to EDs. This 500m distance included five EDs, Whitehall D, Grace park, Beaumont F, Whitehall A and Whitehall B. This Local Area excludes Beaumont A, Drumcondra South A and Drumcondra South C which were accounted for within the 1km buffer distance. Drumcondra South A (10.79% increase) and Drumcondra South C (10.22% increase) demonstrate the second and third highest increase in population percentage change from 2011-2016 by ED. There is potential for these two EDs to skew data results within the 1km buffer distance therefore a 500m Local Area Population is also observed. The Local Area Population within 500m had a population of 19,429 in 2011 and 20,266 in 2016 which results in a population growth of 4.31%. As previously stated, the CSO census data shows that the population of Ireland increased by 3.8% from 2011 and 2016. Comparing the 1km Local Area population with the 500m Local Area population indicates that the 500m Local Area population is more accurate in relation to national trends between the years 2011-2016. However, this subject site is located within Dublin and the average population growth rate from 2011-2016 for Dublin was 5.8% therefore it can be concluded that the 1km Local Area Population (growth rate of 5.6%) represents a more accurate percentage growth for the region in which it is located compared to the 500m Local Area population (growth rate of 4.3%).

Electoral Divisions	2011 Population	2016 Population	% Change 2011-2016
Whitehall D	2,885	3,456	19.79% increase
Whitehall A	3,545	3,286	7.31% decrease
Whitehall B	3,892	4,128	6.06% increase
Beaumont F	3,437	3,590	4.45% increase
Grace Park	5,670	5,806	2.40% increase
Total	19,429	20,266	4.31% increase

Table 4-4 Census Population Data for Electoral Divisions in a 500m Distance of the Subject Site. Data Source: CSO

Age Profile

Approximately 31,310 no. people were living within the Local Area at a 1km distance of the subject site at the time of the 2016 Census, an 5.6% increase on the 2011 population.

The Local Area (1km) has seen an 15.13% increase in Pre-School population aged between 0-4 years, an increase of 8.12% in population of older adults and elderly (65+ years old) and a decrease of 4.58% for school children (5-19 years old). Age groups 20-34 years (26.80%) and 35-65 years (34.99%) are age groups linked to employment and working professionals. These age groups dominate the Local Areas population in 2016 as it accounts for 61.79%. Within the employment section of this chapter, it is evident that large employment bodies are present in

the area and would justify this dominance. The areas strong representation (61.79%) of working age people (20-64) living in the area in 2016 is in line with the national average of 59.1% people aged 20-64.

The area is performing below the national average in relation to young people, the state's population averages at 27.5% under 20 years. The Local Area in question consists of 19.77% of people under 20, this is a stark contrast when compared to the national average.

The 5-19 age group saw a percentage decrease of 4.58% from 2011 to 2016. Comparing this statistic against the increasing typical working people age groups provides evidence to suggest that the population are work orientated. Further analysis should be considered against the employment section of this chapter.

The Local Area predominantly consists of an older population in 2016 as 53.44% of the population are over 35 despite the large increase in the pre-school age group. The large increase in pre-school children is determined due to the low starting figure in 2011.

Considering the analysed data, it can be expected that the age profile for the local area will be altered with new individuals, couples, and small families moving into the new development. This may result in a younger age profile overall compared to the existing age profile, but this would depend on the demographic of the new residents.

2011 Population	2016 Population	Population Change 2011-2016	Percentage Change 2011-2016
29,658	31,310	1,652	5.57%

Table 4-5 CSO Local Area Population Change based on census data

Age	2011	2016	Change	Percentage Change
0-4 Pre-school	1375	1583	+208	15.13% increase
5-19 School Children	4827	4606	-221	4.58% decrease
20-34 Adults	7966	8390	+424	5.32% increase
35-64 Adults	10148	10955	+807	7.95% increase
65+ Adults	5342	5776	+434	8.12% increase

Table 4-6 CSO Census Data – Local Area Population age groups

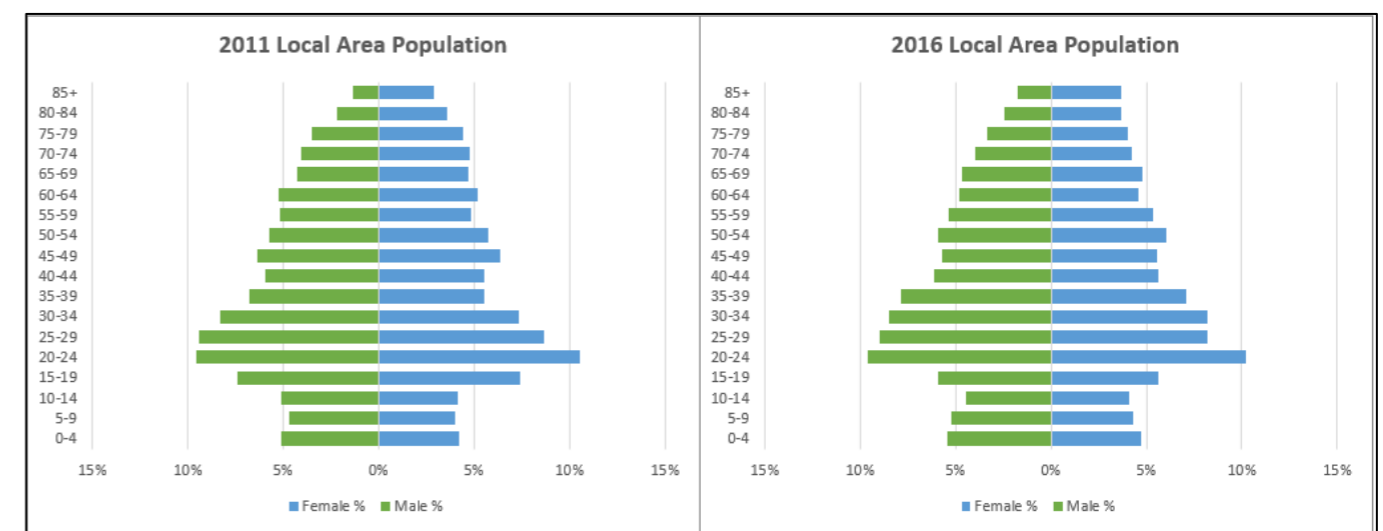


Figure 4-2 Local Area 2011 and 2016 Population Pyramids. Data Source: CSO

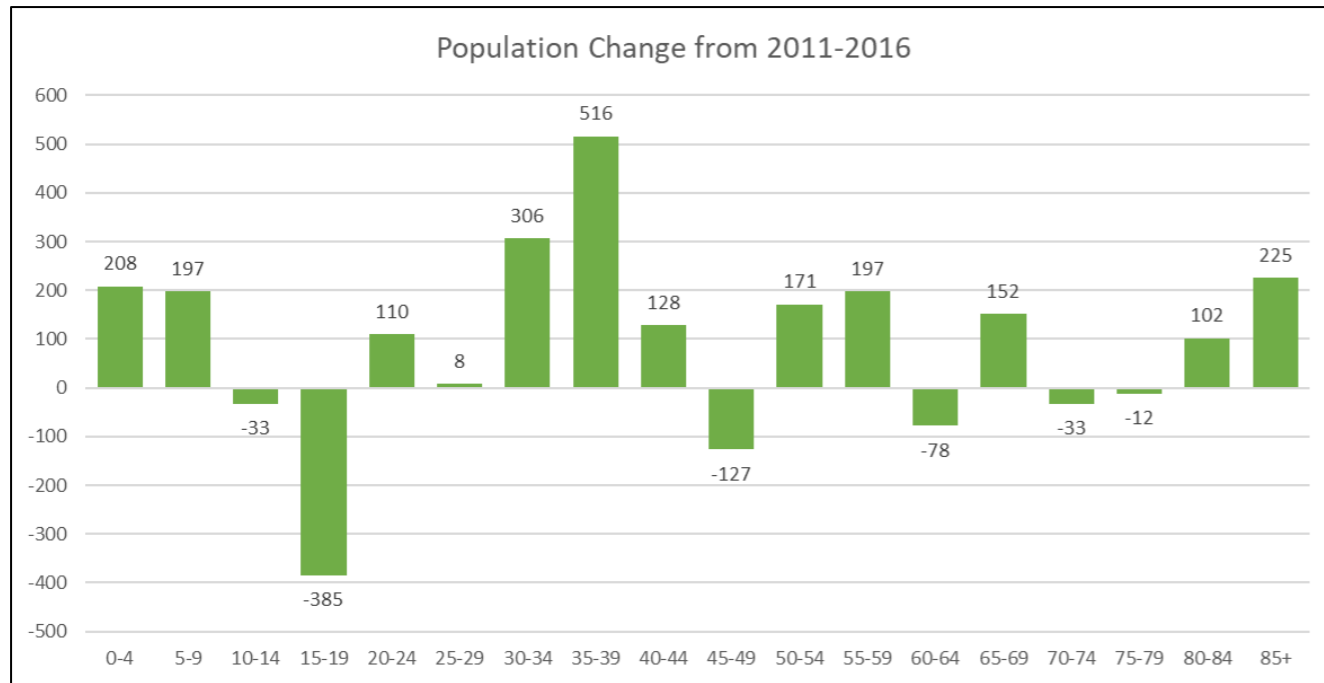


Figure 4-3 Raw Change in Local Area Population from 2011-2016 by Age Group. Data Source: CSO

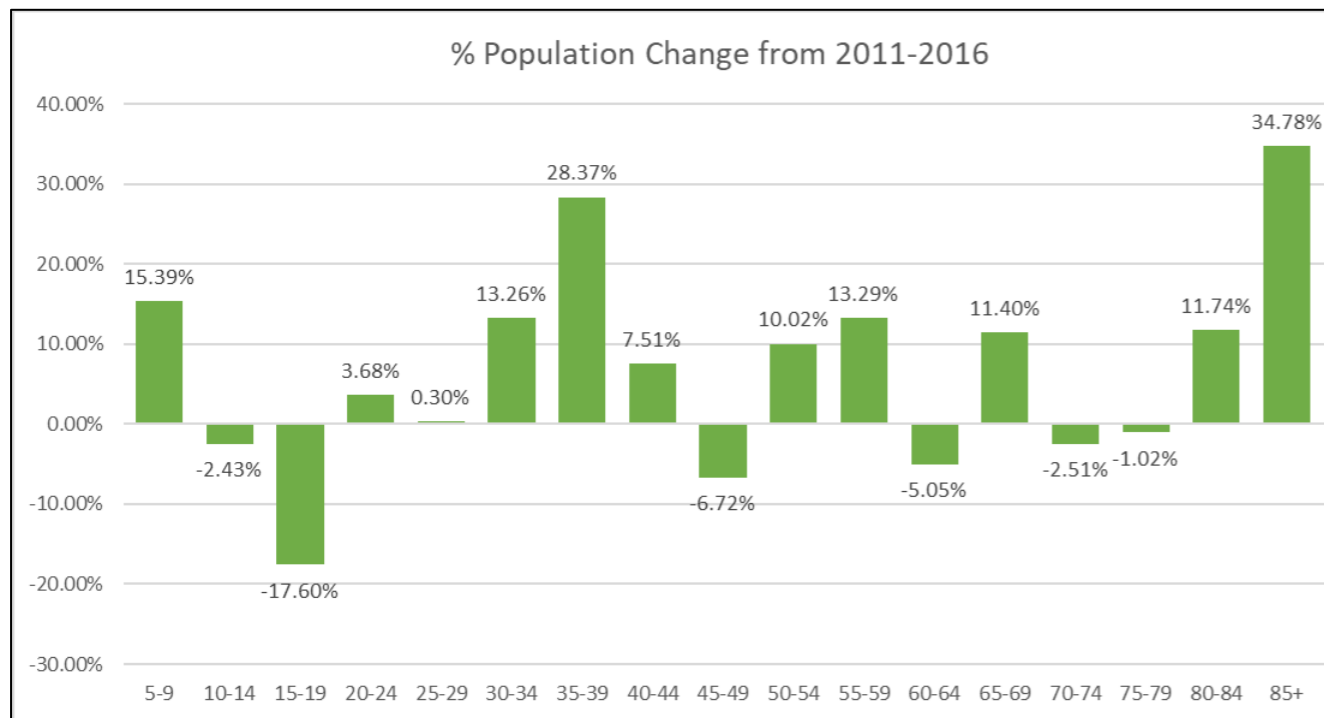


Figure 4-4 % Change in Population from 2011-2016 by Age Group. Data Source: CSO

Employment

The CSO's Quarterly Labour Force Survey (LFS) provides information in relation to national employment levels, unemployment levels and current labour force participation rates. The Covid-19 pandemic has significantly impacted the employment and unemployment levels since March 2020. Therefore, slightly adjusted measures are now produced to ensure transparency around the impact of Covid-19 on the labour market.

- Since March 2020 the CSO has produced an extra COVID-19 Adjusted Measure of Monthly Unemployment. This measure adds people who receive the Pandemic Unemployment Payment (PUP) to the monthly estimate of unemployed persons.
- Since Q1 2020, the CSO has provide a Covid-19 Adjusted Measure of Employment as part of the LFS. The measure subtracts people receiving the PUP at the end of each quarter from the numbers in employment as measured by the LFS.

The CSO notes that, given the uncertainty regarding the official labour market status for those individuals receiving the PUP, the COVID-19 Adjusted Measure of Unemployment can be seen as the upper bound or highest possible value for unemployment, while the COVID-19 Adjusted Measure of Employment can be seen as the lower bound or the lowest possible value for employment.

The unadjusted data for Q3 of 2021 shows an increase in employment of 6.20% compared to Q3 of 2019, while unemployment increased by 16.48% over the same period. The unadjusted percentage change in standard employment for Q3 2020 to Q3 2021 is 7.67% and the Covid adjusted unemployment percentage change from Q3 2020 to Q3 2021 is -40.98% which outlines people slowly returning back to work from the global pandemic.

ILO Economic Status Ireland	Q3 2019	Q3 2020	Q3 2021	Annual Change	
All Persons				2019-2020	%
In Labour Force	2,454,900	2,469,800	2,620,300	165,400	6.74%
In Employment	2,326,900	2,295,200	2,471,200	144,300	6.20%
Unemployed	128,000	174,700	149,100	21,100	16.48%
Not in Labour Force	1,470,700	1,514,300	1,407,700	-63,000	-4.28%
Total Persons aged 15 or over	3,925,600	3,984,100	4,028,000	102,400	2.61%
Unemployment Rate %	4.90%	7.10%	5.7%	-	-

Table 4-7 Labour Force Survey Q3 2019, 2020 and 2021 (Standard methodology)

	Standard In Employment	Covid Adjusted In Employment	Standard Unemployment	Covid Adjusted Unemployment
Q3 2020	2,295,200	2,078,058	174,700	394,538
Q3 2021	2,471,200	2,369,731	149,100	232,866
Change	176,000	291,673	-25,600	-161,672
% Change	7.67%	14.04%	-14.65%	-40.98%

Table 4-8 Comparison between Standard and Covid Adjusted figures

Retail and Community Facilities

A desktop survey of the existing retail and community services within a 1km buffer of the site was carried out. The key retail areas are identified in blue in figure 4-6

These retail areas are identified in both the existing Dublin City Development Plan 2016-2022 and the draft Dublin City Development Plan 2022-2028 as neighbourhood centres.

The neighbourhood centres at Swords Road (Whitehall) and Collins Avenue (Whitehall) provide a range of services adjacent to the subject site. These wide range of services are listed throughout *Table 4-10* below.

In addition to these neighbourhood centres within 1km of the site, Omni Shopping Centre is c. 1.2km north of the subject site, just outside the 1km buffer area. This shopping centre is just an 18-minute walk and consists of high street retail shops as well as convenience stores such as Lidl and an 11 screen Cinema.

Neighbourhood Centres	Facilities
Swords Road (Whitehall)	Food & Beverages, Health and Beauty, Local Services
Collins Avenue (Whitehall)	Convenience Retail, Local Services, Food & Beverages, Health & Beauty
Beaumont Road	Convenience Retail, Food & Beverages, Health & Beauty, Local Services
Swords Road (Santry)	Convenience Retail, local Services, Health & Beauty, Food & Beverages

Table 4-9 Neighbourhood Centres as shown in Figure 4-5

The three maps below show other facilities, amenities, and employment areas outside of the neighbourhood centres.

- There are two parks within a 30 minute walk of the site – Ellenfield Park and Courtlands Park.
- There are numerous GPs, Pharmacies and Health Centres within 1km of the subject site.

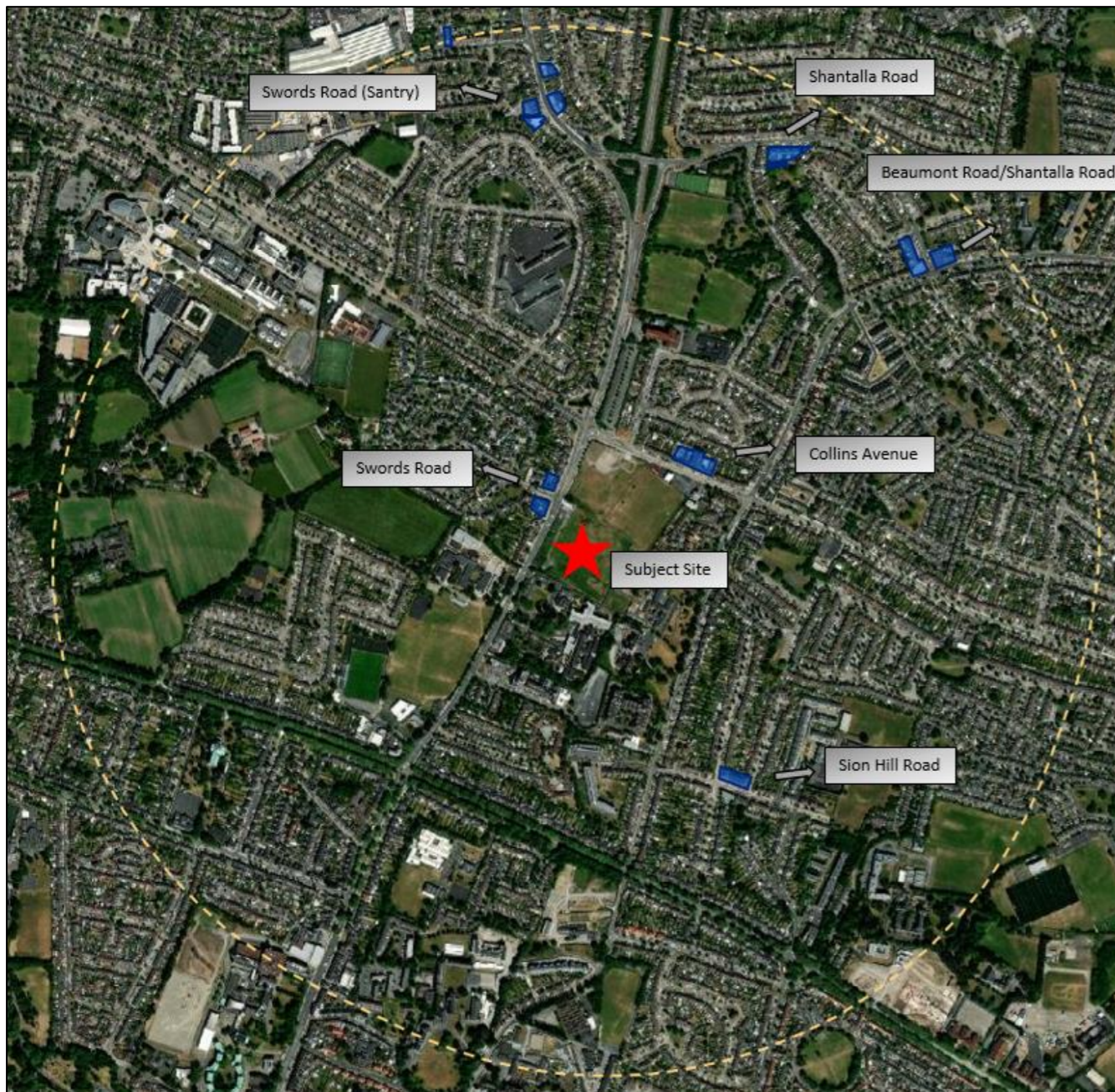


Figure 4-5 Neighbourhood centres surrounding the subject site within a 1km buffer distance

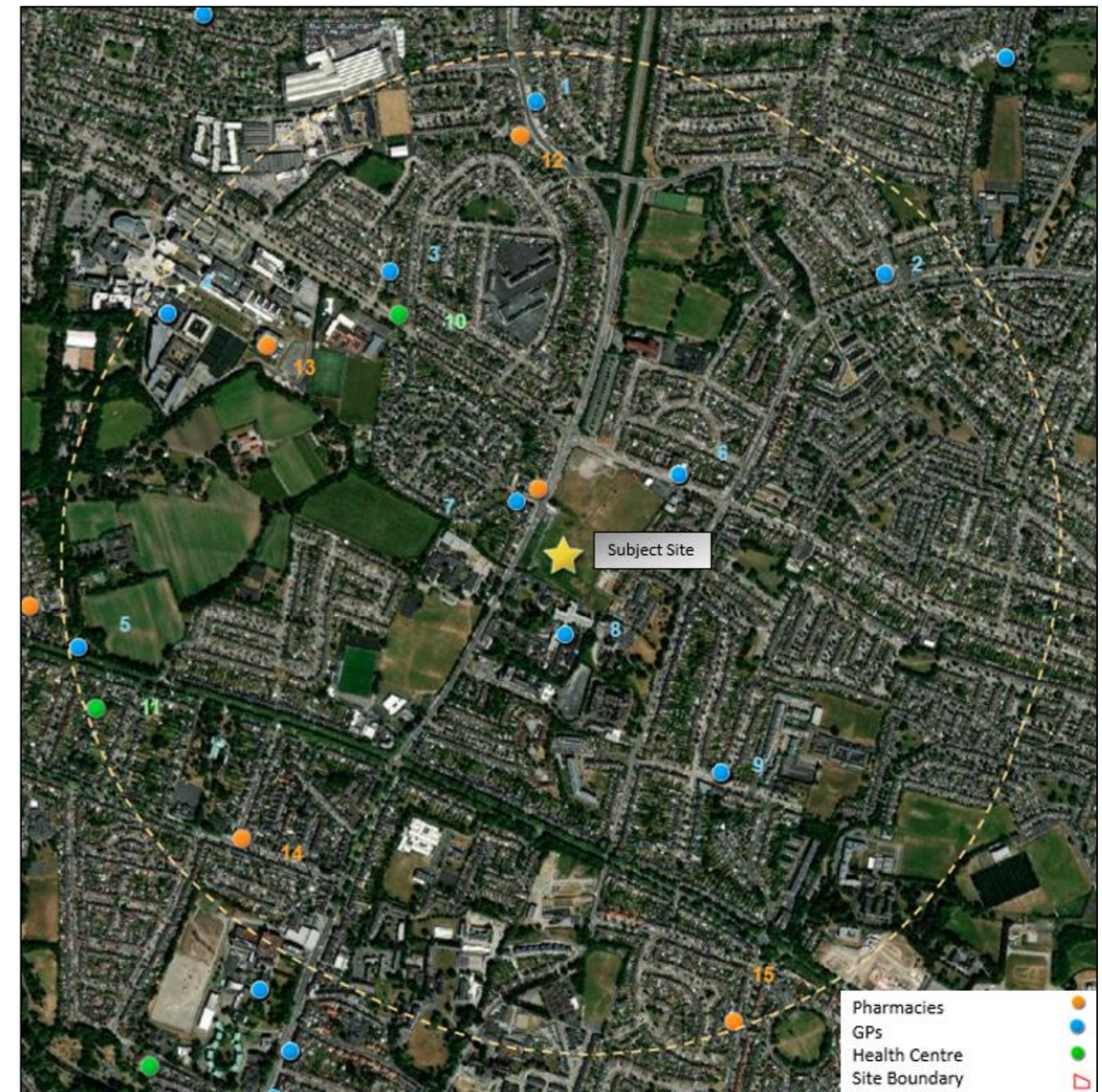


Figure 4-6 Health Facilities in relation to subject site within a 1km buffer distance.

Map Ref	Health Facilities	Location
No. 1	Swords Road Medical Practice	Swords Road
No. 2	Doherty's Pharmacy Ltd	Shantalla Road
No. 3	Crestfield Medical Practice	Crestfield Drive
No. 4	Student Health Service – DCU	Glasnevin Campus
No. 5	Griffith Avenue Practice	Griffith Avenue
No. 6	Devines Pharmacy Limited	Collins Avenue
No. 7	Dr. Cox General Practitioner	Iveragh Road
No. 8	Highfield Healthcare	Swords Road
No. 9	Calderwood Family Clinic	Sion Hill Road
No. 10	Larkhill Health Centre	Collins Avenue
No. 11	Marino Heath Centre	Griffith Avenue
No. 12	Life Pharmacy	Swords Road
No. 13	Pharmhealth Integrative Pharmacy	Henry Grattan Building (DCU)
No. 14	Homepharm Limited	Homefarm Road
No. 15	Bank's Pharmacy	Philipsburgh Avenue

Table 4-10 Health Facilities as shown in figure 4-6



Figure 4-7 Park, recreational and sports facilities within 1km distance of the Subject site

Map Ref	Open Space	Location
No. 1	Ellenfield Park	Glencorp Road
No. 2	Courtlands Park	Walnut Avenue
Map Ref	Sports Grounds and Facilities	Location
No. 1	DCU Sports Grounds (Chesterfield Avenue)	Glasnevin
No. 2	St Kevin's Boys Football Club	Shanowen Road
No. 3	Marino College of Education and St Vincent's GAA Club	Gracepark
No. 4 (a)(b)	Whitehall Colmcille GAA (Pitch and Clubhouse)	Collins Avenue
No. 5	Plunket College/Rosmini Gaels GAA	Swords Road
No. 6	Home Farm Football Club	Swords Road

Map Ref	Cultural and Recreational Facilities	Location
No. 1	The Helix Theatre DCU	Collins Avenue
No. 2	The Church of the Holy Child (Whitehall)	The Thatch Road
No. 3	Corpus Christi Roman Catholic Church	Home Farm Road
No. 4	Bonnington Hotel (Leisure Club and Conference Centre)	Swords Road
No. 5	The Goose Tavern (Public House)	Sion Hill Road
No. 6	The Viscount (Public House)	Swords Road
No. 7	The Comet (Public House)	Swords Road
No. 8	Beaumont House (Public House)	Beaumont Road

Table 4-11 Parks, Recreational and Sports Facilities as shown in Figure 4-9

We note that there are further facilities, including supermarkets, cafes, restaurants, hairdressers, located within 1km of the subject site which are listed in the table below.

Existing Facilities with 1km of Subject Site	Location
Supermarket/Food Shop	
Centra	Swords Road (Santry)
Centra (Regency Hotel)	Swords Road (Whitehall)
Shay's Costcutter	Collins Avenue
Gala	Collins Avenue
Mace	Beaumont Road
Circle K	Beaumont Road
Mace	Drumcondra Road Upper
Lidl	Drumcondra Road Upper
Cafés/Restaurants/Beverages	
Gourmet Kitchen	Collins Avenue
Ramini Take Away	Collins Avenue
Alex's Take Away	Beaumont Road
India Link Take Away	Beaumont Road
Delight City	Beaumont Road
San Marino	Swords Road (Santry)
Sans	Swords Road (Santry)
Carry Out	Swords Road (Santry)
Airport Take Away	Swords Road (Whitehall)
Golden Palace	Swords Road (Whitehall)
Magic Work	Swords Road (Whitehall)
Kruz Diner Gastropub Dining	Swords Road (Whitehall)
McGettigan's D9	Swords Road (Whitehall)
The Ivy House	Drumcondra Road Upper
Il Corvo	Drumcondra Road Upper
San Sab Thai Restaurant	Drumcondra Road Upper
Cat and Cage	Drumcondra Road Upper
Health and Wellbeing	
Pat's Barbers	Collins Avenue
Adrian Dunne/The Salon	Collins Avenue
Haircandy	Beaumont Road
Orchid's Hair & Beauty	Swords Road (Santry)
Linda's Hair & Beauty Salon	Swords Road (Santry)
Pamper Time Hair & Beauty	Swords Road (Santry)

Pelo Hairdressing & Scalp Specialists	Swords Road (Whitehall)
Other Facilities	
JR Fireplaces	Beaumont Road
Ladbrokees	Beaumont Road
Smith & Butler Property Management	Swords Road (Santry)
Larkhill & District Credit Union	Swords Road (Santry)
Solicitors	Swords Road (Santry)
Paddy Power	Swords Road (Santry)
Boyle Sports	Swords Road (Whitehall)
Aideens Florist	Collins Avenue
Rafael Slovinski Wedding Photography	Swords Road (Whitehall)
Flyfit Drumcondra	Drumcondra Road Upper

Table 4-12 List of existing facilities within 1km of subject site

Childcare

Desktop research was carried out analysing information provided by Pobal and Dublin City Childcare Committee. A catchment area comprising of a 1km buffer from the subject site was chosen as the basis for analysing the childcare provision in the area.

Pobal, the government agency, maintains an up to date map of registered childcare facilities within Ireland, enabling an objective analysis of childcare provision and the targeting of areas where facilities may be needed in the future. McGill Planning Ltd also liaised with Dublin City Childcare Committee (DCCC) who completed a survey of the existing facilities. The survey took place in January 2022. The results of the conducted survey are shown in the table below. The survey allowed for an up to date analysis of the existing facilities in the area and demonstrates the requirement of this scheme to provide a creche. However, it is worth noting that the survey took place while loose restrictions may have been in place from the Covid-19 pandemic which may have impacted the number of children attending the childcare facilities. Although restrictions have eased since the beginning of the pandemic it is still worth noting that childcare facilities may have decreased capacities resulting from the pandemic and associated staff changes.

There are 7 no. existing childcare facilities within 1km of the subject site. Based on the surveys completed by DCCC, there are c. 322 no. childcare spaces and 40 no. vacancies within 1km of the site

We note that the number of vacancies within a childcare facility are often in flux so the 40 no. vacancies in the childcare facilities surveyed by DCCC within 1km is a rough estimate. It is likely that the childcare facilities which were surveyed within January 2022 were returning to full capacity due to the ease of restrictions from the global pandemic.

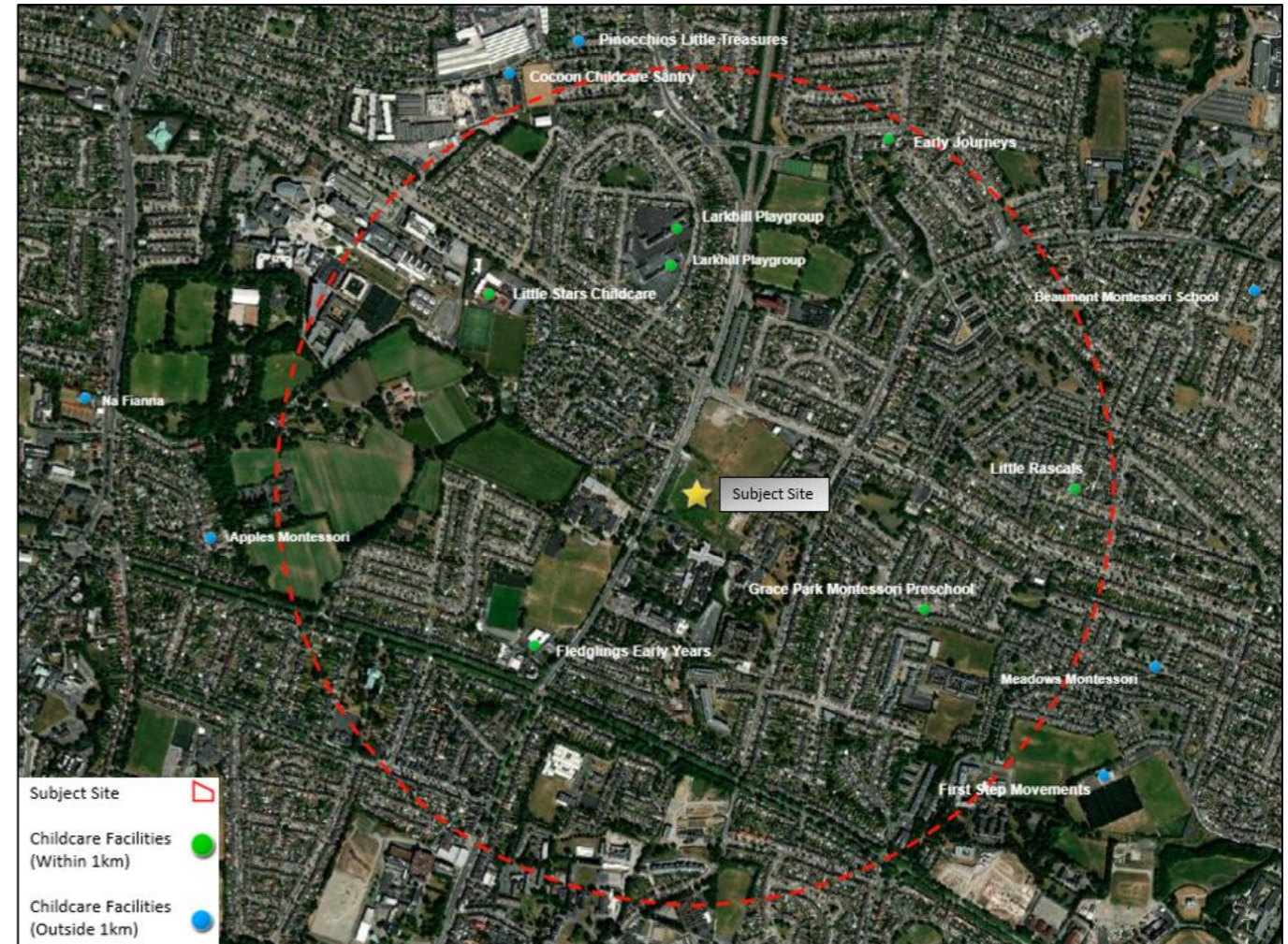


Figure 4-8 Locations of Childcare Facilities within 1km of the Subject Site

Crèche/Childcare Facility	Total no. Children	Current Availability	Services Offered
Within 1km of the subject site			
1. Larkhill Playgroup	32	0	ECCE, Sessional, PT
2. Larkhill Playgroup	22	0	ECCE, Sessional
3. Early Journeys	SAC 33 ECCE 30	SAC 10 ECCE 15	ECCE, Sessional/SAC
4. Little Stars Montessori	22	4	Sessional
5. Little Rascals – Clever Cloggs	100	0	ECCE, FDC
6. Grace Park Montessori	44	6	ECCE, Sessional
7. Fledgings Early Years Whitehall College Creche	39	5	FDC/PT
Total	322	40	
<i>(Note: Many of the Full Time Care also provide sessional/part time/afterschool care in conjunction with the Full Time Care.)</i>			

Table 4-13 Childcare Facilities within 1km of the subject site

Schools

Desktop research of the schools in the area was carried out using the available information from The Department of Education and Google Maps. A 1km Catchment Area was chosen as the basis for examining the schools in relation to the subject site. Within this catchment, there are four primary schools and seven post-primary schools. There is also one special school and 5 third level education facilities, 3 of which are departments connected to Dublin City University. The locations of these schools are shown in figure 4-11 below.

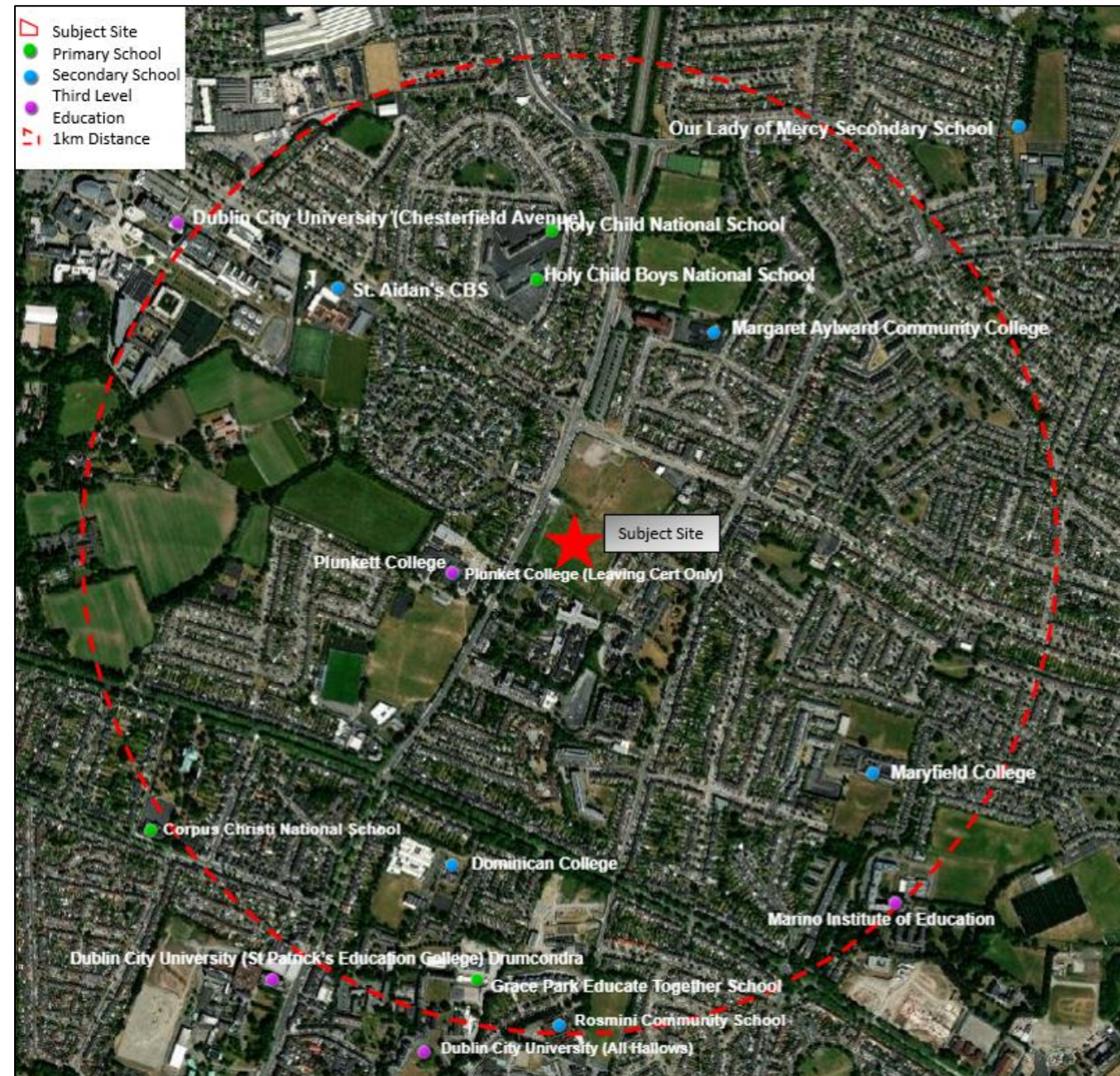


Figure 4-9 Schools within 1km of subject site

The Department of Education provides enrolment information for all primary and post primary schools in the country. The 2021/2022 enrolment figures for the schools within 1km of the subject site are shown in the table below. The capacity of each of the schools has been estimated based on average classroom sizes at primary school level and the teacher to student ratio for post-primary level. The Houses of the Oireachtas illustrate information in relation to education in Ireland up until 2020. This research outlines that the average class size in 2018 is 24.3.

in terms of pupil to teacher ratios in 2018 this ratio for primary school was 15.2:1 and 12.7:1 for post primary schools. The National Council for Special Education in Ireland published a research report in 2014 which revealed that the average size of a mixed ASD/Special Needs class is 6 students within primary schools. Within mixed post primary schools the average size of an ASD/Special Needs class is 10. For boys only primary schools this average is 6 whereas the average for all girls primary schools was undetermined. With regards to all boys post primary schools the average is 6.3 and 9.9 in all girls schools.

Holy Child National School consists of 17 general classrooms and two ASD classrooms. Holy Child Boys National School contains 12 general classrooms and 2 ASD classrooms. Grace Park Educate Together School contains 16 general classrooms. Corpus Christi National School consists of 17 general classrooms and 3 ASD classrooms. Based on an average 24.3 no. primary school children per classroom and 6 no. children per ASD/Special Needs classroom, it is estimated that there are 205 no. spaces available between these four primary schools.

At post primary level, teachers are currently averaging at a ratio of 12.7:1 according to the Houses of the Oireachtas research report in 2020. However, in 2021 the Department of Education created a document which outlines guidance on PTR allocation, this guidance concludes that the average PTR allocation is 19:1 and should be considered. The capacity of the post-primary schools in the area was estimated by assuming there is one teacher per classroom. From determining the provision of classrooms by each school it is then calculated against the PTR allocation by the Department of Education. Our Lady of Mercy Secondary School has 25 general classrooms, Maryfield College has 30 general classrooms and Rosmini Community school consists of 10 general classrooms. St. Aidan's CBS employs 55 general teaching staff; therefore, an assumption has been made that there is 1 teacher per classrooms therefore it is assumed there is 55 classrooms. It was unclear how many classrooms is provided within the Margaret Aylward Community College, Plunkett College and Dominican College and therefore the capacity of these schools has not been estimated. Nonetheless, between the other listed schools there is c. 538 no. school places available in the vicinity.

Roll No.	Primary Schools	Ethos	Gender	2021/22 Enrolment	Approx. Capacity
20338C	Holy Child National School	Catholic	Mixed	409 (Boys 92/ Girls 317)	16
17318C	Holy Child Boys National School	Catholic	Boys	250	54
20486R	Grace Park Educate Together School	Multi Denominational	Mixed	282 (Boys 155/Girls 127)	107
16860Q	Corpus Christi National School	Catholic	Girls	403	28
Total				1,344	205
Roll No.	Post-Primary Schools	Ethos	Gender	2021/22 Enrolment	Approx. Capacity following 19:1 PTR
60870T	Our Lady of Mercy Secondary College	Catholic	Girls	365	110
70321P	Margaret Aylward Community College	Inter Denominational	Mixed	113 (Boys 15/ Girls 98)	-
60840K	Maryfield College	Catholic	Girls	572	-2
60690R	Dominican College	Catholic	Girls	763	-

70310K	Plunket College (Leaving Certificate Only)	Inter Denominational	Mixed	(Boys 24/ Girls 16)	-
91344V	Rosmini Community School	Inter Denominational	Mixed	101 (Boys 73/ Girls 28)	89
60481I	St. Aidan's CBS	Catholic	Boys	704	341
Total				2,658	538

Table 4-14 Schools within 1km Catchment of Subject Site

Health

Human Health is a very broad factor and is interrelated with climate and air quality, water quality, the noise environment, access to nature, mobility and accessibility, and human connections.

The surrounding context of the site consists of a mix of residential, community and amenity related land uses. The maturely developed surrounding area of Whitehall has resulted in a permeable and well-connected layout with more direct routes for people to walk and cycle through the subject site as well as to surrounding areas.

The surrounding area does not include any man-made industrial sites or processes (including SEVESO II Directive sites) that would be likely to result in a risk to human health and safety.

Chapter 9 Climate and Air Quality identified domestic and commercial heating sources and road traffic as the dominant contributors of hydrocarbon, combustion gases and particulate emissions to ambient air quality, which is typical of an urban environment. This chapter outlines the baseline concentration of Nitrogen Dioxide, Nitrogen Oxide, Particulate Matter, Benzene, and Carbon Monoxide.

Chapter 8 Noise and Vibration notes that the dominate noise source at the subject site is passing traffic on the adjacent streets.

Access to nature has biological, mental, and social benefits to people. There are numerous parks within the vicinity of the subject site. Ellenfield Park is located c. 400m north of the subject site and provides a large public open space with playing fields and green spaces.

4.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will consist of the construction of 7 no. blocks in heights up to 8 storeys (over single level basement) comprising 472 no. apartment units, a creche, café unit, and internal residential amenity space. The proposal also includes car, cycle, and motorcycle parking, public and communal open spaces, landscaping, bin stores, plant areas, substations, switch rooms, and all associated site development works and services provision. Access is provided from the development from Swords Road with associated upgrades to the existing public road and footpaths. A full description of the development is provided in the statutory notices and in Chapter 3 of the EIAR submitted with the application.

4.5 POTENTIAL IMPACTS

Impacts on Businesses and Residences

Construction Phase

The construction of the proposed development is likely to have a positive effect on the local employment and economic activity. The development in the short term (5 years maximum) will provide for construction related employment during the different stages of development, with additional spend in the local shops, restaurants etc.

Businesses directly involved in the construction phase of the development will generate value and secure direct employment which in turn will contribute to the overall GDP of the economy and tax revenues.

Operational Phase

The proposed development will provide 472 no. residential units and considering the national average household size of 2.75 people this development will likely generate a population of c.1,298 when fully occupied.

Considering the number of people in employment in the local area (61.79%), it can be expected that c.803 of the population generated will be working. This increase in the local employment population will contribute positively to local businesses and amenities, while also improving the vibrancy and vitality of the area and the community.

The proposed retail unit and creche will bring new employment and economic activity to the area and will support the existing and future residential populations.

Impacts on Air Quality and Climate

Construction Phase

The construction associated with the development will cause disturbance to the site and the locality to a certain extent. The likely impacts from the disturbance includes dust emissions from moving heavy machinery and construction traffic. If not properly mitigated this has the potential to impact the surrounding population and human health.

Due to the extent of works on the site the increase in exhaust emissions will be a short-term effect and will not have any significant detrimental impacts to the air quality. The potential for an increase in exhaust emissions and dust release into the atmosphere will be managed through the Dust Management Plan in Appendix 9.3 and the mitigation measures set out in the Construction and Environmental Management Plan accompanying the planning application.

Operational Phase

During the operational phase of the development, it is expected that air quality impacts will predominantly occur as a result of the change in traffic flows in the local areas associated with the proposed development. Chapter 9 of this EIAR states that the operational phase results conclude that *“emissions as a result of the proposed development are compliant with all National and EU ambient air quality limit values and, therefore, will not result in a significant impact on human health.”*

Impacts on Retail and Community Services

Construction Phase

During the construction phase, the local retail and community services will be temporarily negatively impacted by construction noise, traffic and dust. Although negative, this impact will be minor and will only continue for the construction period. The local retail and community services will also be positively impacted by increased spending in the area by construction workers.

Operational Phase

The local population increase that will be generated by the proposed development will support the existing and retail and community facilities in the area. The proposed retail unit will serve both the proposed development and the surrounding area. It will complement the existing retail in the area.

Impacts on Human Health

The European Commission's *Guidance on the preparation of the Environmental Impact Assessment Report* states at footnote no. 2

'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.'

It is clear from this broad definition that human health is interrelated with many factors which are addressed in separate EIAR Chapters. The relevant potential impacts from those chapters are summarised below.

Construction Phase

The construction phase of the proposed development may give rise to short term (less than 5 years) impacts to the locality such as

- increased construction traffic including the hauling of building materials to and from the proposed development site
- increased surface contaminants,
- increased exposure to dust and exhaust emissions,
- increased exposure to traffic and construction noise, and
- increased littering.

Chapter 11 Traffic and Transportation notes that the potential impact of the construction period is anticipated to generate an increase in vehicle movements during the morning and evening peak periods. Chapter 11 concludes that *"In practice, it is expected that only 45 no. construction staff trips are made on a daily basis and the day to day impact would be significantly lower than that of the worst case scenario."*

Chapter 9 Climate and Air Quality notes that the greatest potential impact on air quality is from construction dust emissions and the potential for nuisance dust and PM₁₀/PM_{2.5} emissions. It also notes that there is potential for a number of greenhouse gas emissions to the atmosphere during the construction of the development.

Chapter 8 Noise and Vibration notes that the construction phase will potentially result in short-term noise and vibration impacts due to site clearance, groundworks and subsequent construction works.

Chapter 7 Hydrology and Water Services notes that the connection of watermain on site will require the public water network to be suspended for a period to allow connection into the existing network.

Chapter 12 Material Assets notes that there is potential for contamination of potable water supply, gas leaks or explosions, loss of supply of services which would impact on the local population.

Operational Phase

The operational stage of the development is unlikely to cause any adverse impacts on the existing and future residents of the locality in terms of human health. The design of the development has been formulated to provide for a safe environment for the future residents and visitors alike. The paths, roadways and public realm have been designed in accordance with the best practice and applicable guidelines. All open areas have been designed to be inviting, safe and conveniently located.

When complete the proposed development will increase the permeability and walkability of the area by providing safe and inviting pedestrian connections between the existing Whitehall GAA pitches and to Ellenfield Park to the north of the proposed development. The provision of improved cycle lanes along Swords Road will be implanted to ensure walking and cycling are an attractive transport mode and will encourage people to walk and cycle, which will in turn increase daily physical activity and improve people's health.

Chapter 11 Traffic and Transportation outlines the introduction of a signalised junction at the Swords Road will formalise the road network and provide a net benefit to pedestrians, cyclists and motorists by providing a dedicated crossing facilities on all arms of the Swords Road/ Iveragh Road/ Site Access junction.

Chapter 9 Climate and Air Quality notes that 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_x, CO, C and PM₁₀.

Chapter 8 Noise and Vibration identifies the following primary potential sources of noise during the operational phase: additional vehicular traffic on public roads, mechanical plant noise, residential, retail unit, gym and creche.

Impacts on Childcare

Construction Phase

During the construction phase, the childcare facilities within close vicinity of the subject site may be temporarily impacted by construction noise, traffic and dust. Although negative, this impact will be minor and will only continue for the construction period.

Operational Phase

The proposed developments projected need for childcare spaces has been based on the local demographics, the quarterly national household survey, and national guidelines.

The Childcare Facilities Guidelines for Planning Authorities (2001) provides a standard of one childcare facility with a minimum 20 childcare places per approximately 75 dwellings. This would require a childcare facility of c. 126 no. childcare spaces for the proposed development.

The 2020 Guidelines on Design Standards for New Apartments note that the threshold for the provision of childcare facilities *'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'*. It also notes that *'one-bedroom or studio type units should not generally be considered to contribute to a requirement for any childcare provision and subject to location, this may also apply in part or whole, to units with two or more bedrooms'*.

The national average household size was 2.75 no. people in the 2016 census (Source: CSO). Based on this, it is estimated that the proposed 472 no. units will have a population of c. 1,298 no. people (472*2.75). An analysis of the 2016 population data for the local area shows that c. 5.06% of the population is aged 0-4. It is therefore estimated that the proposed development will result in a 0-4 aged population of c. 66 no. children (5.06% of 1,298).

The proposed development includes 230 no. studio and 1 bed units. When these are excluded from the calculation, the proposed development would provide c. 32 no. children aged 0-4. When the two bed units are also excluded the proposal would result in just c. 2 children aged 0-4. Due to the scale of development, it is expected the proposal would result in more than c. 2 no. children aged 0-4 and therefore the exclusion of all 2 bed units represents an unrealistic projection.

This projected increase in the local area's 0-4 aged population will result in an increased demand for childcare facilities. However, not all children require childcare. The 2016 Quarterly National Household Survey Childcare Module notes that only c.25% of children in the Dublin area attend private childcare. It is possible that this percentage has been impacted by Covid-19, but in the absence of more recent data we will assess the proposed development in line with the 25%. We have also included a 'worst-case scenario' in which 50% of children may require childcare. Applying the 25% to the expected children, it can be assumed that just c. 17 children from the development will require childcare (25% of 66). When the studios and one beds are excluded it is projected just c. 9 no. children in the development would require childcare. It is therefore expected that the proposed development would require between c. 9 and c. 17 no. childcare spaces. Applying 50% of the expected children would suggest that up to c. 33 no, children would require childcare.

Type of childcare	Pre-school children								
	Border	Midland	West	Dublin	Mid-East	Mid-West	South-East	South-West	State
Parent / Partner	65	56	59	62	65	51	67	65	62
Unpaid relative or family friend	16	13	18	16	16	16	20	22	17
Paid relative or family friend	2	5	2	3	5	1	4	2	3
Childminder / Au Pair / Nanny	13	18	21	8	13	13	13	12	13
Creche / Montessori / Playgroup / After-school facility	15	14	15	25	14	28	17	16	19
Other	1	<1	<1	1	<1	1	1	1	1
Total pre-school children using non-parental childcare	45	47	49	46	45	53	45	45	46
Unweighted sample	198	136	234	525	244	189	230	316	2,072

Figure 4-10 Extract from Quarterly National Household Survey, 2016 Q4 Module on Childcare

The table below provides an overview of the expected childcare demand resulting from the Hartfield Place development, as calculated in line with the above guidelines and local demographics.

	2001 Childcare Guidelines	2020 Apartment Guidelines	
	Total Units	Without 1 beds and studios	Without 1 and 2 beds
No. of Proposed Units	472	242	9
2001 Guidelines 20 spaces/75 units	126	65	3
Population Analysis			
Total Population (2.75 per household)	1,298	666	25
Population 0-4 (5.06% of total pop)	66	34	2

Quarterly National Household Survey			
Total requiring childcare (25%)	17	9	1
Total requiring childcare (50%)	33	17	1

Table 4-15 Projected Childcare Demand from Proposed Development

It is noted that there are 7 no. childcare facilities within 1km of the subject site which had a total of 40 no. vacancies when surveyed. A creche is included with this proposed development to ensure existing residents and the future population of the development will not have to walk more than 10 minutes to a childcare facility.

The proposed development includes a creche which will provide c. 63 no. full time childcare spaces and 73 no. children during ECCE. This childcare facility will have sufficient space to cater for the expected demand of maximum c.66 no. children from Hartfield Place.

Impacts on Schools

Construction Phase

During the construction phase of development there will be minimal impact on the surrounding schools. The school will be temporarily negatively impacted by construction noise and dust. However, any negative impact will be of short duration and will be mitigated appropriately.

Operational Phase

The 2016 census indicates the share of population in the Primary School (4-11) and Post Primary School (12-18) years. This percentage share was used to estimate the number of primary and post-primary school children the proposed development would generate.

An analysis of the 2016 Census information shows that the total population for the Local Area Population was 31,310 people, of which 2,033 were of primary school age and 2,031 were of post-primary school age. This equates to approximately 6.49% of the population as primary school age and approximately 6.49% as post-primary school age.

Local Area Catchment	Number of People	% Total 2016 Population
Primary School Age (5-11)	2,033	6.49%
Post Primary School Age (12-18)	2,031	6.49%
Total 2016 Population	31,310	100%

Table 4-16 Breakdown of 2016 Local Population

The national household size, according to the 2016 census, is 2.75 people. The proposed residential development contains 472 no. units and will have an expected population of c. 1,298 when mature. Using the percentages explained above, the estimated maximum primary school going population that would be generated by the development is c. 85 and c. 85 students for post-primary.

Projected Population for Development when Mature	
	Hartfield Place
Total Population	1,298
Primary School Age (5-11)	85
Post Primary School Age (12-18)	85

Table 4-17 Projected School Aged Population of Development

Based on the assessment of the school capacity in the area, it is noted that there is c.205 no. spaces currently available at primary school level and at least 538 no. spaces at post-primary level. Therefore, it is considered that

there is sufficient capacity within the existing schools in the area to cater for the increased demand expected from the proposed Hartfield Place development.

We note that the expected demand of c. 85 no. primary school places at primary school level from the entire development does not exceed the number of spaces currently available within the primary schools.

The expected demand of c. 85 no. post-primary school places from the entire development will easily be catered for within the capacity of the existing post-primary schools within 1km of the site.

We note that enrolment levels in schools change over time and national enrolment projections estimate decreasing enrolment numbers first at primary school and 5 years later at post primary school. These national projections are carried out by the Department of Education.

The Department of Education published *Projections of Full-Time Enrolment Primary and Second Level 2020-2038* in November 2020 which outlined the results of 3 possible scenarios for the future enrolment in schools. Enrolment projections show that primary school enrolment numbers reached their peak in 2018 and that a continuous decline in enrolment until 2036 is expected. The projected enrolment for post-primary schools is not expected to peak until 2024 or 2025, which is then expected to be followed by a continuous decline until 2039.

Following these projections, it could be assumed that the increase in primary school aged children caused by the development may be lower than the c. 85 children as projected above. However, we note that these national projections may not be directly applicable to the local area.

Figure 1 Actual and projected enrolments in primary schools, 1989-2051

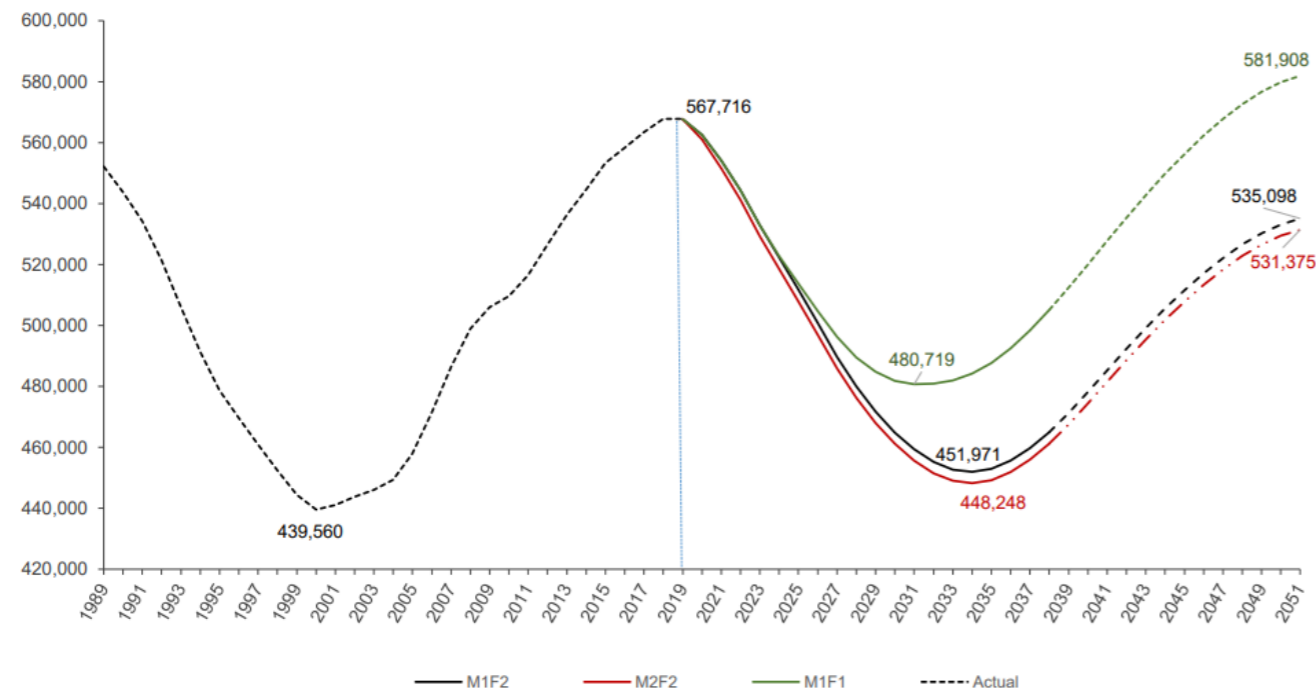


Figure 4-11 Projected Primary School Enrolment. Source: Dept. of Education

Figure 2 Actual and projected enrolments in post-primary schools, 1989-2051

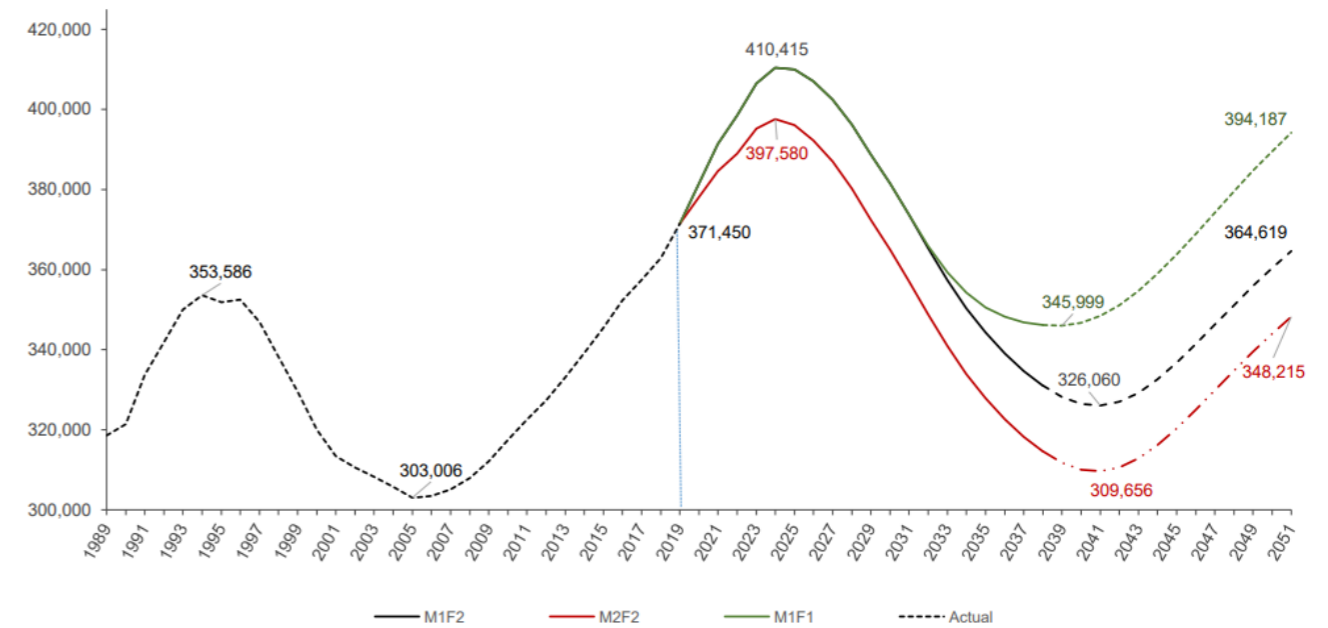


Figure 4-12 Projected Post-Primary Enrolment. Source: Dept. of Education

4.6 POTENTIAL CUMULATIVE IMPACTS

Overall, the cumulative impacts of the proposed development on the population and human health are envisaged to be positive. The significant new population will contribute to the economic viability of the area, increasing in spending and a range of new services and facilities and new open spaces will add to the viability and vibrancy of the area. The existing services and facilities will tap into the expanding population and invest more. Schools, Buses, shops etc. will benefit from the increase in population.

4.7 MITIGATION MEASURES

Construction Phase

A preliminary Construction and Environmental Management Plan (CEMP) has been prepared by Punch and will be implemented during the construction phase to reduce the detrimental effects of the construction phase on the environment and local population. A more detailed CEMP will be formally agreed in writing with the planning authority in writing prior to the commencement of the development (the preliminary CEMP, incorporating mitigation measures, is included with this application).

Chapter 8 notes that the application of Best Practicable Means (BPM) through the implementation of the CEMP will ensure construction noise and vibration impacts are minimised.

The Dust Management Plan included in Appendix 9.3 will minimize the impact of dust nuisance.

Chapter 11 Traffic and Transportation and the CEMP submitted with the application include traffic management measures to minimise the impact of construction traffic.

These measures are put forward to avoid any significant negative environmental impacts on the population and human health. No additional mitigation measures are considered necessary.

Operational Phase

The proposed development has been designed to avoid negative impacts on population and human health through the provision of various physical and social infrastructure as part of the development as are outlined in Chapter 3 of this EIAR.

Chapter 9 Climate and Air Quality notes the proposal includes operational phase mitigation by design measures to minimise the impact on air quality and climate. These include thermally efficient glazing, thermal insulation, natural gas heating, inclusion of electric car charging points.

Chapter 11 Traffic and Transportation notes that a Mobility Management Plan and Parking Strategy has been prepared for the proposed development with the aim of managing and mitigating the impacts of private vehicle usage and promote sustainable travel trends to and from the proposed development.

No additional mitigation measures are considered necessary.

4.8 PREDICTED IMPACTS

Construction Phase

Any adverse likely and significant environmental impacts will be avoided by the implementation of the remedial and mitigation measures proposed throughout this EIAR. Positive impacts are likely to arise due to an increase in employment and economic activity associated with the construction of the proposed development. The overall predicted likely and significant impact of the construction phase will be short-term, temporary and neutral.

Chapter 8 Noise and Vibration notes that with the incorporation of mitigation measures outline within chapter 8, construction noise are likely to be a Temporary Moderate Adverse effect, which is not considered to be significant. Construction vibration at nearby sensitive receptors are well below the limits and not significant. The construction traffic noise impacts are very low and also not significant.

the application of binding noise limits, hours of operation, along with implementation of the mitigation measures identified herein, will ensure that noise and vibration impact will have a negative, moderate, and short-term impact on the surrounding environment.

Chapter 9 Climate and Air Quality notes that the impact on the air quality and climate will be imperceptible once mitigation measures are implemented.

Chapter 11 Traffic and Transportation notes that the predicted impacts will generate a low level impact on the road network in comparison to the baseline traffic and with the preparation of a detailed CMP to manage construction traffic no residual impacts are anticipated.

Positive impacts are likely to arise due to an increase in employment and economic activity associated with the construction of the proposed development.

The overall predicted likely and significant impact of the construction phase will be short-term, temporary and neutral.

Operational Phase

The proposed development will contribute to further growth and expansion of the neighbourhood contributing to the existing and future populations. The predicted impacts of the Operational Phase are considered to be long term and positive to population and human health.

Chapter 8 Noise and Vibration notes that the predicted impact, once mitigation measures are implemented, of additional traffic, the mechanical plant, retail unit, gym and the creche will be of neutral, imperceptible, and long-term impact. With suitable external building fabric (including glazing and ventilation), the site is considered to be suitable for the proposed residential use.

Chapter 9 Climate and Air Quality notes that the likely overall magnitude of the changes on air quality and climate in the operational stage is imperceptible.

Chapter 11 Traffic and Transportation notes that the impact of the proposed development is anticipated to generate a low level impact on the road network in comparison to the baseline traffic and with the preparation of a Car Parking Strategy, Mobility Management Plan and Site Servicing and Operation Plan managing traffic and transportation impacts.

Overall, the predicted impacts of the Operational Phase are considered to be long term and positive to population and human health.

4.9 CONCLUSIONS

Do Nothing Scenario

A 'do nothing' scenario will result in the subject site remaining undeveloped.

Worst Case Scenario

The worst-case scenario for the development will be a situation where the development is only partially completed.

4.10 MONITORING AND REINSTATEMENT

The monitoring measures required for the aspects of water, air quality and climate, noise, landscape and visual impact, etc provides an appropriate response in this instance. There are no reinstatement works proposed for the proposed site.

4.11 DIFFICULTIES IN COMPILING INFORMATION

As outlined above, there were two minor limitations in compiling the population data.

- The census data that informed this chapter's analysis dates from 2016. Had the Covid pandemic not occurred then the 2021 Census would've been carried out and preliminary result from same could be incorporated into this assessment.
- This chapter was prepared during the Covid-19 pandemic which has impacted childcare capacity levels. It is not yet clear what the long-term effects of this pandemic will be. It is therefore not possible to estimate the current capacity of the childcare facilities in the area with high accuracy as circumstances are constantly changing. Although this challenge was encountered, an assessment was carried out to try and determine levels of childcare vacancy within the area. However, to conclude, a creche is proposed as part of the development to cater for the future population created by the scheme.

Despite these limitations to the data collection, every effort was made to ensure that the data collected and analysed was as accurate as possible.

4.12 REFERENCES

Central Statistics Office, 2021, *Labour Force Survey Quarter 3 2021*. Available at: <https://www.cso.ie/en/releasesandpublications/ep/p-lfs/labourforcesurveyquarter32021/>

Central Statistics Office, 2021, *Population and Migration Estimates, April 2021*. Available at: <https://www.cso.ie/en/releasesandpublications/ep/p-pme/populationandmigrationestimatesapril2021/>

Central Statistics Office, 2016, *Census 2016 Small Area Population Statistics*. Available at: <http://census.cso.ie/sapmap/>

Department of Education, 2022, *Primary schools enrolment figures*. Available at: <https://www.gov.ie/en/collection/primary-schools/#20212022>

Department of Education, 2022, *Post-primary schools enrolment figures*. Available at: <https://www.gov.ie/en/collection/post-primary-schools/#20212022>

Department of Education, 2020, *Projections of Full Time Enrolment Primary and Second Level 2020-2038*. Available online at: <https://www.gov.ie/en/collection/projections/>

Pobal, 2022, *Childcare Services Map*. Available at: <https://maps.pobal.ie/WebApps/ChildcareFacilities/index.html>

Department of Education, 2021, *Staffing arrangements in Education and Training Boards for the 2021/22 school year*. Available at: <https://www.gov.ie/pdf/?file=https://assets.gov.ie/128132/f022a08e-24a6-494d-8e2b-f67d5af94bf3.pdf#page=null>

National Council for Special Education, 2014, *Understanding Special Class Provision in Ireland Phase 1: Findings from a National Survey of Schools*. Available at: https://ncse.ie/wp-content/uploads/2014/10/Report_16_special_classes_30_04_14.pdf

Houses of the Oireachtas, 2020, *Education in Ireland Statistical Snapshot*. Available at: https://data.oireachtas.ie/ie/oireachtas/libraryResearch/2020/2020-04-03_I-rs-infographic-education-in-ireland-a-statistical-snapshot_en.pdf

5 BIODIVERSITY

5.1 INTRODUCTION

JBA Consulting Ireland Ltd. has been commissioned by Eastwise Construction Swords Limited to prepare the Biodiversity Chapter of this Environmental Impact Assessment (EIA) Report in relation to the proposed Strategic Housing Development (SHD) development at Hartfield Place, Swords Road, Dublin 9.

Expertise and Qualifications

This chapter of the EIA Report has been prepared Malin Lundberg (BSc, MSc), an experienced field ecologist with JBA. Malin has six years' experience of which four are within consultancy. She has prepared Ecological Impact Assessments (EclA) and biodiversity chapters for EIAR for private developers and local authorities, including Sandford Living Limited, Kilcock Car Dismantlers and South Dublin County Council.

The chapter has been reviewed by Patricia Byrne (JBA Consulting (BSc, PhD, MCIEEM)). Patricia is a Senior Ecologist with 20 years' experience of environmental and ecological work, with the last six years as an ecologist with JBA. She has authored and reviewed numerous ecological assessments under the Habitats Directive; and prepared numerous EclAs for residential developments, biodiversity chapters for EIARs including King's Island Flood Relief Scheme for Limerick County Council.

Aims

The aims of the Biodiversity Chapter are to:

- Establish baseline ecological conditions to enable identification of potentially important ecological features within the zone of influence of the project.
- Determine the ecological value of identified ecological features.
- Assess the significance of impacts of the proposed project on ecological features of value.
- Identify avoidance, mitigation or compensatory measures.
- Identify residual impacts after mitigation and the significance of their effects.
- Identify opportunities for ecological enhancement and net gain of biodiversity.

The Existing Site

The proposed development is located east of Swords Road in Whitehall, Co. Dublin. Dublin City University lies approximately 450m north-west of the development site and Clontarf Golf Club lies approximately 1.8km to the south-east. Tolka River runs approximately 1.35km south of the development site. The site is bounded to the west by Swords Road, to the south by Highfield Private Hospital, to the north by vacant lands and GAA pitches and to the east by Beechlawm Nursing Home with residential development beyond (Figure 5-1).



Figure 5-1: Site location

5.2 METHODOLOGY

The assessment considers the works related to the construction phase of the development and the operational phase of the development. The assessment methodology of this chapter is outlined in the sections below.

Relevant Policies and Plans

The policy documents to which this assessment has had regard include the following:

- National Biodiversity Action Plan 2017-2021
- Ireland's National Strategy for Plant Conservation – progress towards 2020
- Dublin City Biodiversity Action Plan 2015-2020 and Draft Dublin City Biodiversity Action Plan 2021-2025
- Dublin City Development Plan 2016-2022

Guidance

This assessment was conducted in accordance with the following guidance documents:

- OPR Practice Note PN02 Environmental Impact Assessment Screening (OPR, June 2021)
- Guidelines for planning authorities and An Board Pleanála on carrying out environmental impact assessment (Department of Housing, Planning and Local Governments, August 2018)
- Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management (CIEEM, 2018).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (Draft) Environmental Protection Agency (EPA, 2017).
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009a).

- Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2008).
- Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council. (Smith *et al.*, 2011).
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition) (Collins, 2016).
- Bat Mitigation Guidelines for Ireland (Kelleher and Marnell, 2006).
- Guidance Note 08/18. Bats and Artificial Lighting in the UK - Bats and the Built Environment series (ILP, 2018).
- Guidelines on The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (NRA, 2010)

Designated Nature Conservation Sites

Sites of international importance including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are collectively known as Natura 2000 sites. These sites contain examples of some of the most important natural and semi-natural ecosystems in Europe. Designated sites, which also include Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs), which are national designations, were also identified within the proposed development's area of influence. The Zone of Influence (ZoI) for designated sites is defined by the presence of pathways; surface water, groundwater and land & air pathways. For groundwater and land & air pathways a 15km distance from the development was used to identify Natura 2000 sites and a 10km distance was used to identify pNHAs/NHAs. The ultimate discharge location for foul water produced on site is at Ringsend Waste Water Treatment Plant's (WWTP) discharge location and a 15km search distance from this location as well as the proposed development location was used to identify all designated sites with potential surface water pathway.

Screening of Ecological Features

The ecological features identified during the walkover surveys and from desk-based assessments were reviewed.

An informal screening process is presented at the start of the results section to ensure that the assessment focuses only on features where the impact could have important consequences for biodiversity (valued ecological features). Any features which are important beyond the site level were identified for further evaluation. Ecological features with little or no value beyond the site level were screened out and a short statement explaining this is given in the screening section.

A separate Appropriate Assessment (AA) Screening Report has been produced (JBA, 2022), to assess the potential for effects on Designated Natura 2000 sites. The AA Screening Report concluded there will be no likely significant effects on any European Natura 2000 sites arising from the proposed development, either alone or in-combination with other plans or projects. Natura 2000 sites are therefore not considered further in this Chapter.

Assessment of the Effects on Features

Ecological features include nature conservation sites, habitats, species assemblages/ communities, populations or groups of species. The assessment of the significance of predicted impacts on ecological features is based on both the 'value' of a feature, and the nature and magnitude of the impact that the project will have on it. The impact is based on the project which includes a certain amount of designed-in mitigation, including construction best practice measures that will be implemented with a high degree of certainty.

Valuation of Receptors

The value of designated sites, habitats and species populations is assessed with reference to:

- Their importance in terms of 'biodiversity conservation' value (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations).

- Any social benefits that habitats and species deliver (e.g. relating to enjoyment of flora and fauna by the public).
- Any economic benefits that they provide.

The valuation of designated sites considers different levels of statutory and non-statutory protection. Assessment of habitat depends on several factors, including the size of the habitat, its conservation status and quality. The assessment also takes account of connected off-site habitat that has the potential to increase the value of the on-site habitat through association. Valuation of species depends on a number of factors including distribution, status, rarity, vulnerability, and the population size present.

Designated sites, habitats and species populations have been valued using the scale in *Table 5-1*.

Level of Value	Examples of Criteria
International	<p>An internationally important site e.g. Special Protection Area (SPA), Special Area of Conservation (SAC), Ramsar (or a site considered worthy of such designation).</p> <p>A regularly occurring substantial population of an internationally important species (listed on Annex IV of the Habitats Directive).</p> <p>Designated shellfish waters.</p> <p>Major fisheries area.</p>
National	<p>A nationally designated site e.g. Natural Heritage Area (NHA), a proposed Natural Heritage Area (pNHA), statutory Nature Reserve, or a site considered worthy of such designation.</p> <p>A viable area of a habitat type listed in Annex I of the Habitats Directive or of smaller areas of such habitat which are essential to maintain the viability of a larger whole.</p> <p>A regularly occurring substantial population of a nationally important species, e.g. listed on The Wildlife Act 1976 or The Wildlife (Amendment) Act 2000.</p> <p>A species included in the Irish Red Data Lists/Books.</p> <p>Significant populations of breeding birds.</p>
Regional/County (Co. Dublin)	<p>Species and habitats of special conservation significance within County Dublin, as identified in Dublin City Biodiversity Action Plan 2015-2020.</p> <p>An area subject to a project/initiative under the County's Biodiversity Action Plan.</p> <p>A regularly occurring substantial population of a nationally scarce species.</p>
Local (works site and its vicinity)	<p>Areas of internationally or nationally important habitats which are degraded and have little or no potential for restoration.</p> <p>A good example of a common or widespread habitat in the local area.</p> <p>Species of national or local importance, but which are only present very infrequently or in very low numbers within site area.</p>
Less than local	<p>Areas of heavily modified or managed vegetation of low species diversity or low value as habitat to species of nature conservation interest.</p>

Common and widespread species.

Table 5-1: Examples of criteria used to define the value of ecological features (NRA, 2009a).

Ecological Valuation may also be considered of Local Importance (higher value) or Local Importance (lower value) (Table 5-2).

Level of Value	Examples of Criteria
Local Importance (higher value)	<p>Locally important populations of priority species or habitats or natural heritage features identified in the Local Biodiversity Action Plan (BAP), if this has been prepared.</p> <p>Resident or regularly occurring populations (assessed to be important at the Local level) of the following:</p> <ul style="list-style-type: none"> Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data List. <p>Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality</p> <p>Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value</p>
Local Importance (lower value)	<p>Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;</p> <p>Sites or features containing non-native species that are of some importance in maintaining habitat links</p>

Table 5-2: Examples of criteria used to define the value of ecological features of local importance.

Descriptive Terminology

Ecological effects or impacts can be described and categorised in a number of ways. Examples of relevant terms are listed in Table 5-3 below.

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

Probability of Effects	<p>The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.</p> <p>Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.</p>
Duration and Frequency of Effects	<p>Temporary Effects Effects lasting less than a year</p> <p>Short-term Effects Effects lasting one to seven years</p> <p>Medium-term Effects lasting seven to fifteen years</p> <p>Long-term Effects Effects lasting fifteen to sixty years.</p>
Types of Effects	<p>Indirect Effects (a.k.a. Secondary Effects) Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.</p> <p>Cumulative Effects The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.</p> <p>'Do-Nothing Effects' The environment as it would be in the future should the subject project not be carried out.</p> <p>'Worst case' Effects The effects arising from a project in the case where mitigation measures substantially fail.</p> <p>Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.</p> <p>Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents,</p>

Table 5-3: Categories of Effects (derived EPA, 2017).

These effects are assessed together to determine the magnitude of the impact on the status of a habitat or species population, and on the integrity of the site that supports them. Professional expertise is then used to assign the impacts on the receptors to one of four classes of magnitude, detailed in Table 5-4.

Magnitude	Definition
High	An irreversible or long-term impact on the integrity of a site or conservation status of a habitat, species assemblage/community, population, or group. If adverse, this is likely to threaten its sustainability; if beneficial, this is likely to enhance its conservation status.
Medium	A medium to long-term impact on the integrity of a site or conservation status of a habitat, species assemblage/community, population, or group, which if adverse, is unlikely to threaten its sustainability (or if beneficial, is likely to be sustainable but is unlikely to enhance its conservation status).
Low	A short-term but temporary impact on the integrity of a site or conservation status of a habitat, species assemblage/community, population or group that is within the range of variation normally experienced between years.
Negligible	A short-term but temporary impact on the integrity of a site or conservation status of a habitat, species assemblage/community, population or group that is within the normal range of annual variation.

Table 5-4: Definition of magnitude.

Significance of impacts

The significance of an impact is a product of the value of the ecological feature and the magnitude of the impact on it, moderated by professional judgement. *Table 5-5* shows a matrix which is used for guidance in the assessment of significance, with impacts being considered to be of major, moderate or minor significance, or negligible. Impacts can also either be assessed as positive or negative using the same matrix.

Value of feature	Magnitude of impact			
	High	Medium	Low	Negligible
International	Major	Major	Moderate	Neutral
National	Major	Moderate	Minor	Neutral
Regional / County	Moderate	Minor	Minor	Neutral
Local	Minor	Minor	Negligible	Neutral
Less than local	Negligible	Negligible	Negligible	Neutral

Table 5-5: Significance of impacts matrix.

Residual Impact

The project is assessed including some designed-in mitigation. This is done where mitigation is proven to be effective and will be implemented effectively with a high certainty. Where significant residual impacts are still identified, further mitigation measures will be proposed as part of the Ecological Impact Assessment process to avoid, reduce or minimise them. Each impact assessment section assigns a final significance level to the impact described, which considers and includes the implementation of any stated mitigation measures; these are the residual impacts.

Baseline

To determine the baseline conditions at the site a review of all available information was made. When determining the pre-work conditions on-site, including the presence or absence of protected habitats and/or species, the precautionary principle was used where limited information was available. The review included the following elements:

- A desk-based assessment was carried out to collate information regarding protected/notable species and statutorily designated nature conservation sites in, or within close proximity to, the study area.
- A data search for protected and notable species was conducted using the National Biodiversity Data Centre (NBDC) Mapping System (NBDC, 2021). The two 2km grid squares (O13T, O13U) surrounding the site were used to encompass the study area and species records were extracted from the map at a 2km² resolution.
- Information for statutory designated sites including Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Ramsar Sites, Natural Heritage Areas (NHAs) and proposed NHAs (pNHA) was collected from the online resources provided by the National Parks and Wildlife Service (NPWS).

Other information on the local area was obtained, including information from the following sources:

- NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- NPWS (2019b). The Status of EU Protected Habitats and Species in Ireland. Habitats Assessment Volume 2. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- NPWS (2019c). The Status of EU Protected Habitats and Species in Ireland. Species Assessment Volume 3. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

- Environmental Protection Agency (EPA) online databases on water quality (Available online at <https://gis.epa.ie/EPAMaps/>).
- Aerial photography available from www.osi.ie and Google Maps <http://maps.google.com/>.
- All Ireland Red Data lists for vascular flora, mammals, butterflies, non-marine molluscs, dragonflies & damselflies, amphibians and fish.
- Water Framework Directive (WFD) water maps (available online at <http://www.wfdireland.ie/maps.html> and <https://www.catchments.ie/>); and
- International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species (available online at <http://www.iucnredlist.org>).

Zone of Influence

The Zone of Influence (Zoi) for the project is based on a determination of the likely extent of the ecological impacts. This will vary for different ecological features, depending on their sensitivities to environmental change. For the majority of the project, impacts will be limited to within the site boundary. However, for impacts relating to airborne emissions, surface and ground water and disturbance, the Zoi is extended. For groundwater and land & air pathways a 15km distance from the development was used to identify Natura 2000 sites and a 10km distance was used to identify pNHAs/NHAs. The ultimate discharge location for foul water produced on site is at Ringsend WWTP discharge location and an additional 15km search distance from this location, as well as the proposed development location, is used to identify all designated sites with potential surface water pathway. These are standard Zoi to apply.

Field Surveys

Ecological baseline surveys were carried out in the area within and directly adjacent to the proposed development site, and the presence or likely presence of protected species, and the presence of good potential habitats for those species. All sites visits, dates, survey team and field survey methodology is summarised in *Table 5-6* and details are given in the sections below.

Survey	Date	Survey method reference
Field survey and baseline ecology (habitats, protected species, invasive species)	28 February 2020 07 September 2021	Best Practise Guidance for Habitat Survey and Mapping, by the Heritage Council (Smith et al., 2011)); Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, 2009b).
Mammal survey	07 September 2021	Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, 2009b).
Bat surveys	28 February 2020 07 September 2021	Bat Surveys for Professional Ecologists (Collins, 2016).
Wintering bird surveys (flight lines)	01 December 2021 09 December 2021 15 December 2021 05 January 2022 18 January 2022 02 February 2022	Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, 2009b); Recommended bird survey methods to inform impact

Survey	Date	Survey method reference
	10 February 2022	assessment of onshore wind farms (Scottish Natural Heritage, 2017).
	23 February 2022	

Table 5-6: Surveys carried out on the site.

Habitat Survey and Baseline Ecology

A field survey was carried out on 28 February 2020 by Ecologists Malin Lundberg and Patricia Byrne of JBA Consulting to inform the ecological baseline of the site. The survey recorded habitats and flora in the area within the development site, and to detect the presence or likely presence of protected species (fauna and flora), and the presence of good potential habitat for those species. The study was also concerned with recording habitats suitable for protected habitats and species and identifying the need for further, more specialist surveys where necessary. Invasive species were also recorded during the baseline survey. Any changes in plant species composition or habitats were noted during the site visit on 7th September 2021. The habitats have been named and described following Fossitt (2000). Aerial photographs and site maps aided the habitat survey. Nomenclature for higher plants principally follows that given in Parnell and Curtis (2012).

Mammal Survey

A mammal survey was carried out on 07 September 2021. The mammal survey recorded any signs of mammal activity or habitation within the site. The survey followed guidelines outlined in 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes' (NRA, 2009b).

Bat Surveys

Preliminary Bat Roost Assessment

A survey for potential bat roosts was carried out on 28 February 2020 within the site and the suitability for bats to forage and commute within/along the site was assessed. Structures and trees were inspected to determine the potential for bat roosts to be present, using the methods specified in Collins (2016). Trees were reinspected on 07 September 2021 and no change since the 2020 survey was noted.

Buildings, structures and trees on the site were categorised as having either 'negligible', 'low', 'moderate' or 'high' roosting potential and this was determined by applying the definitions given within the BCT Guidelines (Collins, 2016). Evidence of bat activity associated with potential roost sites includes bat droppings, urine staining, feeding remains, scratch marks and dead/live bats.

Potential Roosting Features (PRF) on trees include cracks/splits, crevices, rot cavities, fluting, loose bark and areas of Ivy *Hedera hibernica*. Evidence indicating the existence of a bat roost may include dark stains running below holes or cracks, bat droppings, odours, or scratch marks. However, roosting bats may still be present without any external evidence being recorded.

Activity Transect Survey

A bat activity transect survey was carried out on the 07 September 2021. The survey started at sunset (20:00) and was carried out for two hours using heterodyne bat detectors as well as visual observations noted throughout the survey to identify usage of the site. Weather conditions, temperature and the location and nature of each survey were recorded on the Bat Survey Recording Form.

A static bat detector was installed and left for seven nights to record bat activity over a longer period. Data collected by the static detectors was analysed using AnalookW software. Bat surveys followed guidance provided in 'Bat Surveys for Professional Ecologists' (Collins, 2016).

Wintering Bird Surveys (flight lines)

Flight line surveys of the Light-bellied Brent Goose were carried out between December 2021 and February 2022 on the following dates: 01, 09 and 15 December 2021, 05 and 18 January 2022, 02, 10 and 23 February 2022. The survey was carried out to identify if the proposed site is within the flight line of the Light-bellied Brent Goose and to what extent they fly over the site and in close vicinity to the site. Each survey was 2 hours long. Six of the surveys were carried out at dawn and two of the surveys (18 January and 10 February) were carried out at dusk. The timings were chosen as the geese tend to roost at night in the bay at North Bull Island and fly inland during the day to feed on open grasslands in Dublin. The survey techniques were adapted from NRA (2009b) and Scottish Natural Heritage (2017).

Spot checks of two nearby grasslands known to have Light-bellied Brent Goose grazing were undertaken in combination with the flight line surveys, either after when survey was carried out at dawn or before if the survey was carried out at dusk. These sites are Clonturk Community College and St. Vincent's GAA Club, their locations in relation to the proposed site are shown in Figure 5-2.

The flight line surveys were carried out in tandem with wintering bird surveys at two other locations in north Dublin, namely DCU sports ground and Tolka Valley Park / Erin's Isle GAA, with a surveyor at each of these locations on the same dates as the surveys undertaken for the proposed development. Information from these surveys aided the current survey in understanding the movement of the Brent Goose between the Dublin Bay and inland feeding sites.

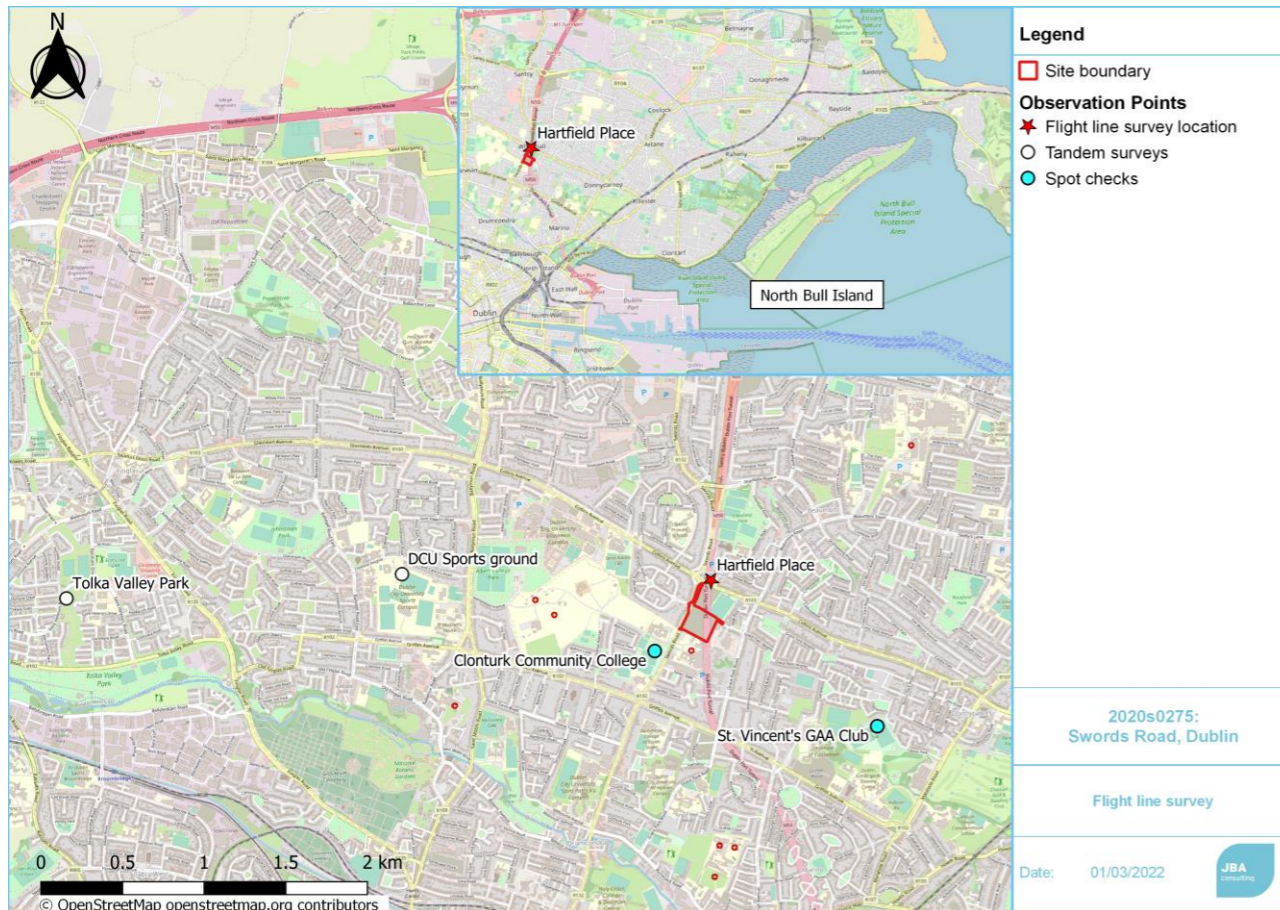


Figure 5-2: Observation location for flight line survey undertaken December 2021-February 2022, tandem surveys and location of spot checks carried out.

Limitations and Constraints

The conclusion of this report necessarily relies on some assumptions, and it is inevitably subject to some limitations. These would not affect the conclusion, but the following points should be taken into consideration during the assessment to ensure the basis of the assessment is clear:

- Data from biological records centres or online databases is historical information, and datasets might be incomplete, inaccurate or missing. It is important to note that even where data is held, a lack of records for a defined geographical area does not necessarily mean that the species is absent; the area may simply be under-recorded. The precautionary principle is used at all times and the suitability of a habitat to support a species is taken into consideration when assessing the likelihood of a species to be present and the ecological sensitivity.
- Changes to the site since surveys were undertaken cannot be accounted for, however the site surveys have followed the CIEEM guidance provided on suitable lifespan for surveys (CIEEM (2019) 'Advice note on the lifespan of ecological reports and surveys').

The impact assessment and design of mitigation measures will take all the above limitations into consideration.

5.3 RECEIVING ENVIRONMENT

Historical background

The proposed site off Sword's Road, Whitehall, Dublin, consists of an area of approx. 2.7ha. The site is bounded by walls on the east and west sides, with metal fencing and trees to the south, and wire fencing to the north, separating the site from a grassed football pitch (Whitehall Colmcille GAA) to the north east, and another open field area to the north west. A grassland field has existed at this site on the fringes of Dublin city since the 1830s (OSI, 2021), except for a period in the early 2000s when the site was used as a central construction site during the development of the 4.5km Dublin Port Tunnel between 2000 and 2006. Whitehall was the location for the final breakthrough of the tunnel into the 'reception pit' in 2004. Figure 5-3 shows the changes in land use of the site since 1995-2012. The site has since revegetated.

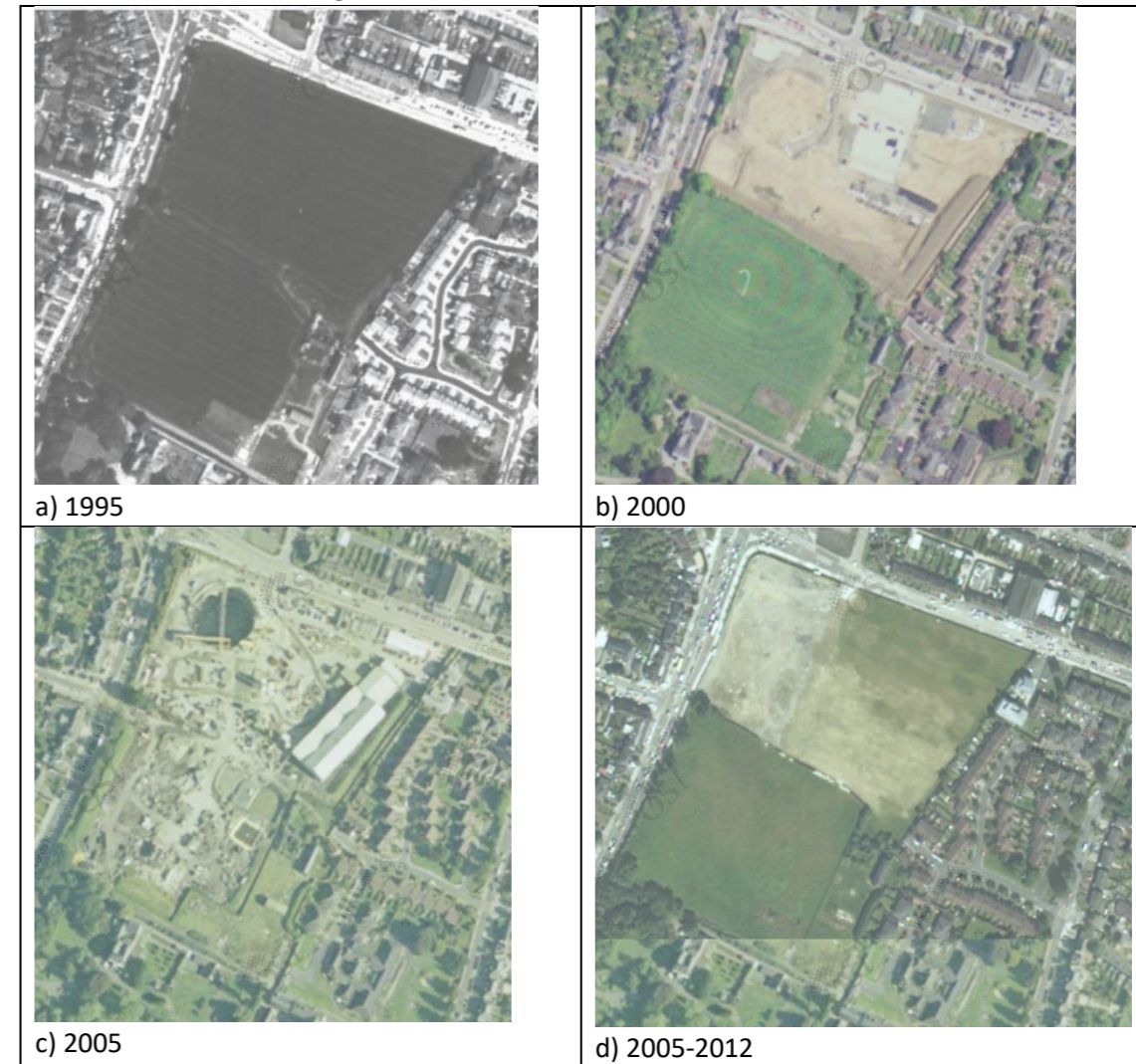


Figure 5-3: Changes in land use of site and surrounds: (a) prior to Dublin Port Tunnel works (b & c) during building of Port Tunnel and (d) showing revegetation after completion of tunnel works (OSI, 2020).

Designated Sites

Natura 2000 Sites

The desktop review identified 16 Natura 2000 sites as occurring within 15km of the project. These are listed in Table 5-7 and shown in Figure 5-4.

Natura 2000 site	Site Code	Approximate distance from site
South Dublin Bay and River Tolka Estuary SPA	004024	2.4 km
North Bull Island SPA	004006	4.6 km
North Dublin Bay SAC	000206	4.6 km
South Dublin Bay SAC	000210	5.2 km
Baldoyle Bay SAC	000199	7.3 km
Baldoyle Bay SPA	004016	7.9 km
Malahide Estuary SPA	004025	9.3 km
Malahide Estuary SAC	000205	9.3 km
Howth Head SAC	000202	9.7 km
Rockabill to Dalkey Island SAC	003000	10.4 km
Ireland's Eye SPA	004117	11.7 km
Ireland's Eye SAC	002193	12.0 km
Howth Head Coast SPA	004113	12.4 km
Rogerstown Estuary SAC	000208	13.5 km
Rogerstown Estuary SPA	004015	13.8 km
Dalkey Islands SPA	004172	14.9 km

Table 5-7 Natura 2000 sites within 15 km of the proposed site.

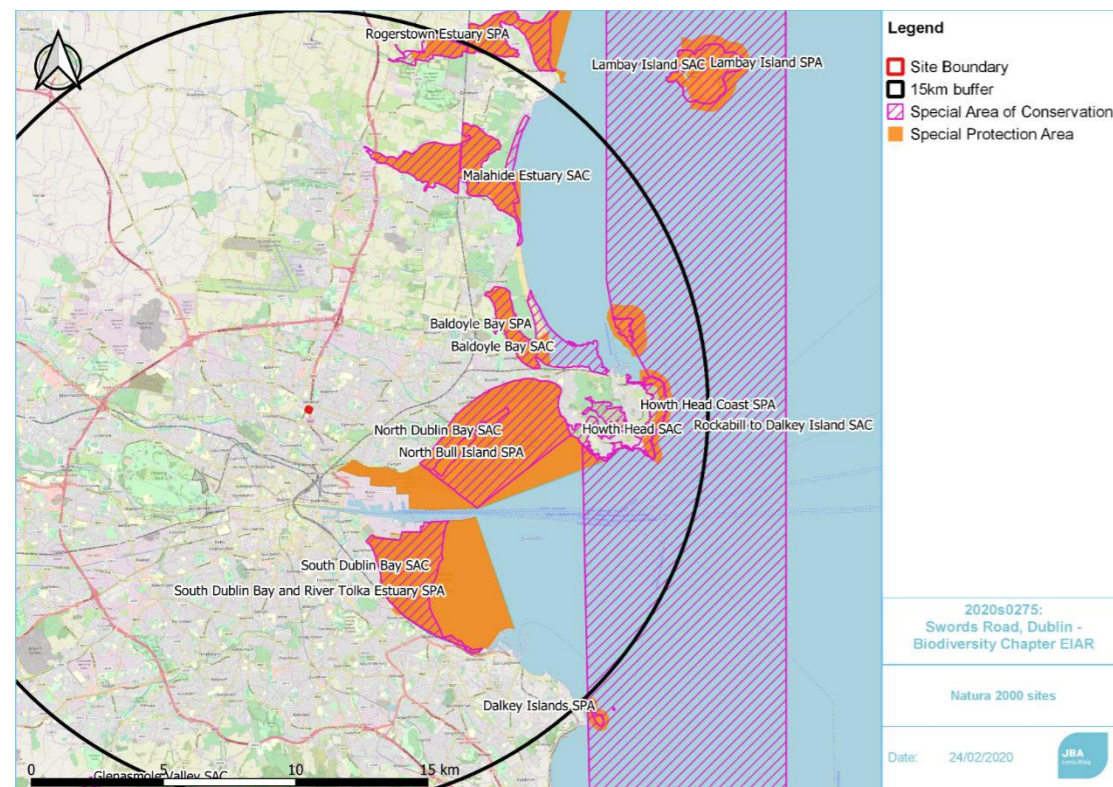


Figure 5-4: Natura 2000 sites within 15km of the proposed development (NPWS, 2021).

Four Natura 2000 sites could potentially be impacted by the proposed project. These are:

- South Dublin Bay and River Tolka Estuary SPA (004024)
- North Bull Island SPA (004006)
- North Dublin Bay SAC (000206)
- Rockabill to Dalkey Island SAC (003000)

A separate AA Screening report (JBA, 2022) is being produced which examines the likely pathways and impacts of the proposed works on these four Natura 2000 sites.

Natural Heritage Areas

There are 13 pNHAs located within 10 km of the site (Table 5-8 and Figure 5-5). Of these 13 sites, five are within Natura 2000 designated sites. These are North Dublin Bay, South Dublin Bay, Baldoyle Bay, Malahide Estuary and Howth Head. As these sites are within Natura 2000 sites, the assessment for these sites is covered within the AA Screening for the proposed site (JBA, 2022).

pNHA Site name	pNHA Site code	Distance from site (km)	Associated Natura 2000 site
Santry Demesne	000178	1.9	
Royal Canal	002103	2.2	
North Dublin Bay	000206	2.3	See above - North Dublin Bay SAC (000206)
Grand Canal	002104	3.9	
Dolphins, Dublin Docks	000201	5.1	
South Dublin Bay	000210	5.2	See above - South Dublin Bay SAC (000210)
Feltrim Hill	001208	6.8	
Baldoyle Bay	000199	7.3	See above - Baldoyle Bay SAC (000199) & Baldoyle Bay SPA (004016)
Liffey Valley	000128	7.5	
Sluice River Marsh	001763	7.7	
Boosterstown Marsh	001205	8.0	
Malahide Estuary	000205	9.3	See above - Malahide Estuary SAC (000205) Malahide Estuary SPA (004025)
Howth Head	000202	9.3	See above -Howth Head SAC (000202)

Table 5-8: pNHA sites within 10 km of the proposed site.

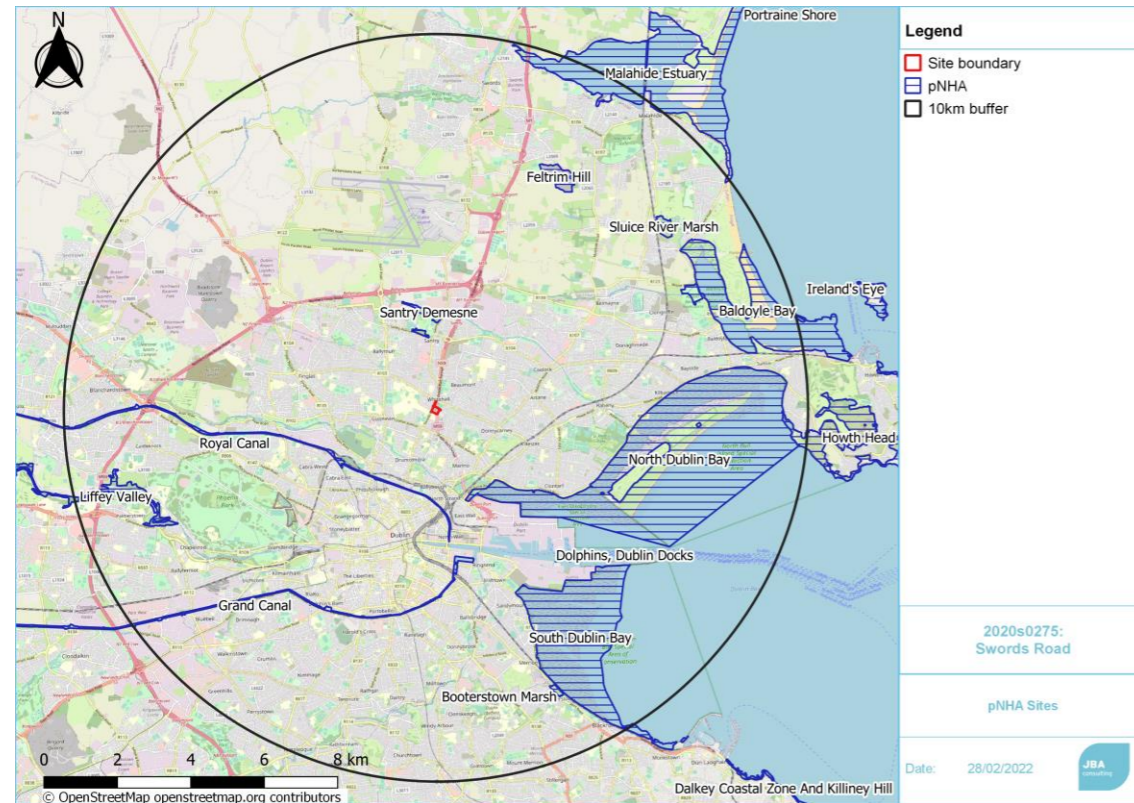


Figure 5-5: pNHA sites within 15km of the proposed development (NPWS, 2021).

Santry Demesne consist of an area of woodland and a separate area of river and riparian habitat alongside the Santry River. Both Royal Canal and Grand Canal pNHAs consist of the canals and their banks. These pNHAs are important as linking corridors allowing dispersal of species through largely urban areas. However, there are no natural features linking the proposed site to either of these three closest pNHAs or the other pNHAs within 15km. None of pNHAs have any hydrological connectivity with the proposed site.

Water Framework Directive

The Water Framework Directive (WFD) (Directive 2000/60/EC) is a substantial piece of EU water legislation that came into force in 2000. The overarching objective of the WFD is for the water bodies in Europe to attain Good or High Ecological Status. The Environment Protection Agency (EPA) is the competent authority in Ireland responsible for delivering the WFD. River Basin Management Plans (RBMP) have been created which set out measures to ensure that water bodies in the country achieve 'Good Ecological Status' as defined by the WFD.

Good Ecological Quality will depend on the quality of the individual quality elements on which the Ecological status is scored; namely the biological, chemical and morphological condition in a particular water body. Any reduction in any of these elements will result in a reduction of the overall ecological status.

Surface Waterbody Status

The proposed development site lies within the WFD Liffey and Dublin Bay Catchment and the sub-catchment Tolka_SC_020 (EPA, 2021).

The closest waterbody to the site is the Tolka River, approximately 1.35km south of the site, which flows in a west-east direction and eventually reaches Dublin Bay. Bachelors Stream is located approximately 2.68km west of the site and feeds into Tolka River. Santry River is located approximately 2.55km north of the site and flows in a west-

east direction, eventually reaching North Dublin Bay. A map of the river network in relation to the proposed site is seen in Figure 5-6. There is no direct connection between the proposed site and the surface water bodies, except through the proposed planned drainage system (i.e. foul and surface water).

Tolka River has a WFD status Poor, with a Q value of 2-3 (EPA, 2021). The dependent Transitional waterbody Tolka Estuary [IE_EA_090_0200] and Liffey Estuary Lower [IE_EA_090_0300] are both deemed At Risk. Dublin Bay Coastal Water Body [IE_EA_090_0000] is deemed Not at risk. The significant pressures identified in the sub-catchments above are combined sewer overflows, diffuse sources run-off and agglomeration PE>10000.

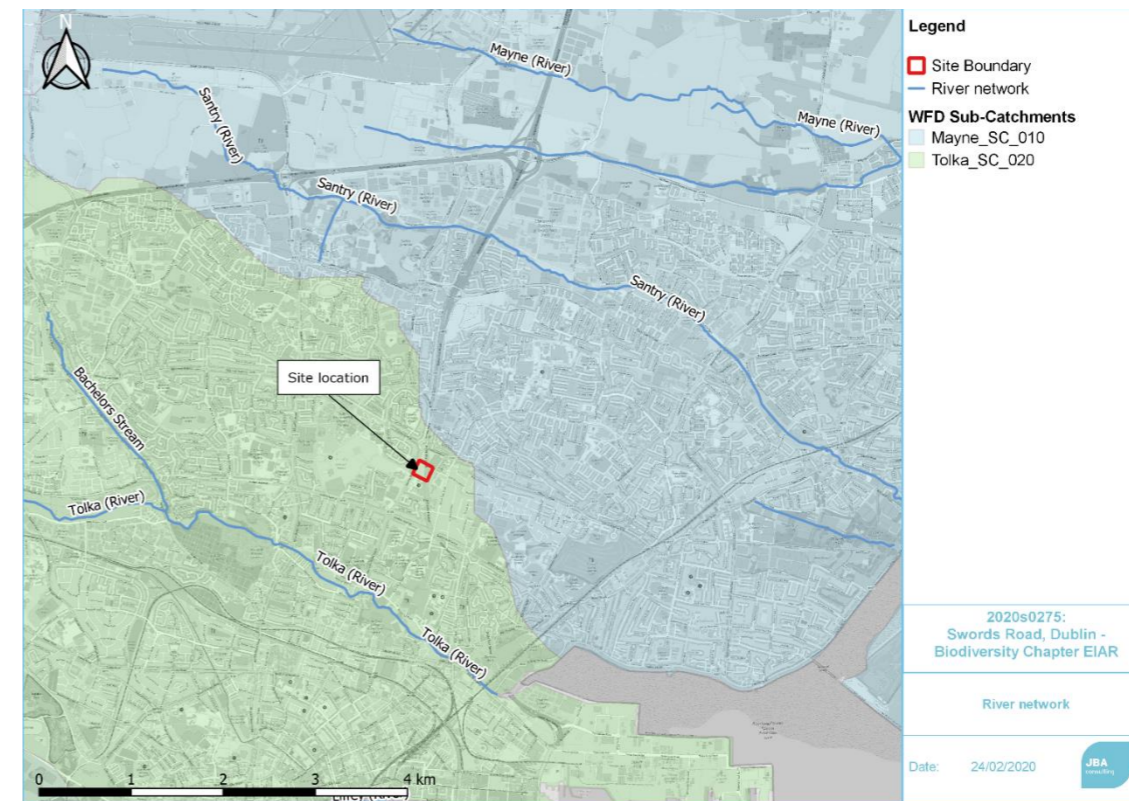


Figure 5-6: River network (EPA, 2021).

Groundwater Body Status

The proposed site is located within Dublin groundwater body (IE_EA_G_008) where the bedrock is limestone and the sub-soil is made up of till (EPA 2020). The aquifer vulnerability of the site is low (Figure 5-7) and the Bedrock is Moderately Productive only in local zones.

North Dublin Bay SAC has qualifying interests (QI) which are groundwater dependent, namely Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] and Mediterranean salt meadows (*Juncetalia maritimi*) [1410]. These habitats are also associated with the QI's of North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA, as these are important habitats for many of the birds. However, given that the proposed site is located in an urban setting where most of the surrounding sub-soil is largely man-made and the aquifer vulnerability is low, negative impacts on the Natura 2000 sites and pNHAs via groundwater are not anticipated, either alone or in combination with other projects.

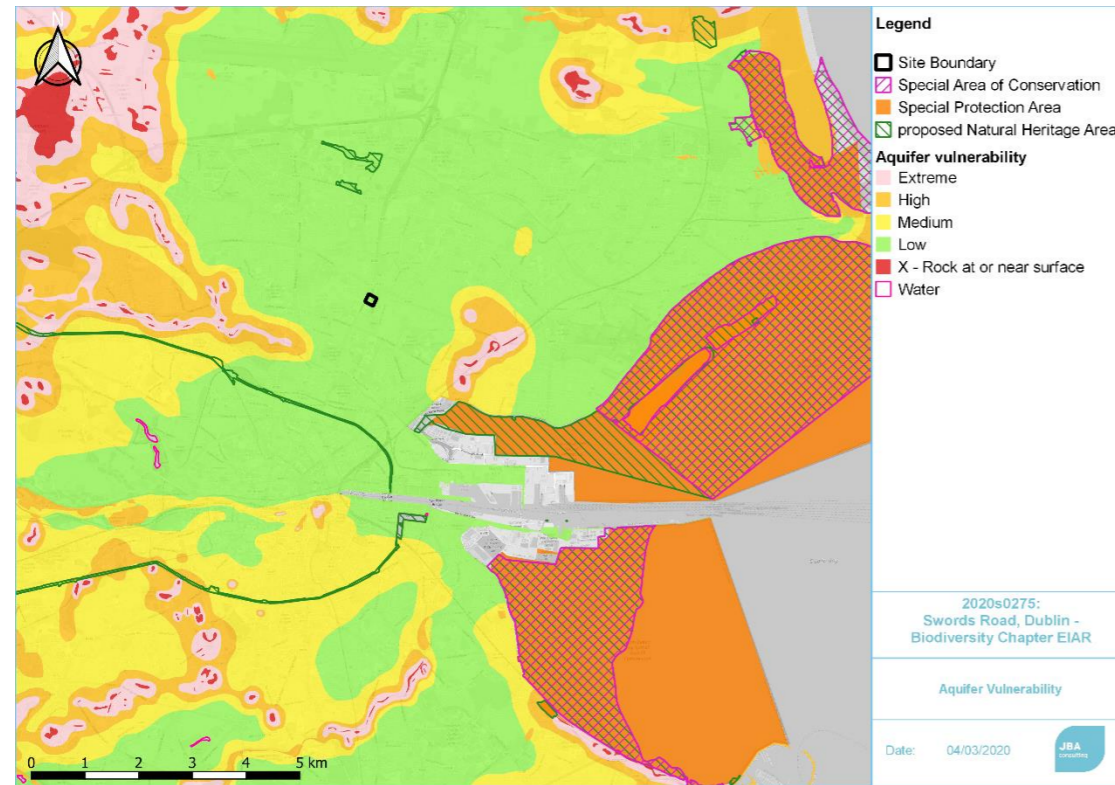


Figure 5-7: Aquifer vulnerability of the proposed site and surrounding (EPA, 2021).

Habitats

A list of habitats recorded during the ecological survey is provided in Table 5-9 below and presented in detail in the following sections. A habitat map is provided in Figure 5-8.

Habitat	Fossitt code
Buildings and artificial surfaces	BL3
Dry calcareous and neutral grassland/Scrub	GS1/ WS1
Recolonising bare ground	ED3
Spoil and bare ground	ED2
Stone walls and other stonework	BL1
Immature woodland	WS2

Table 5-9: Fossitt (2000) habitats recorded during ecological walkover survey.



Figure 5-8: Habitat Map.

BL3 - Buildings and artificial surfaces

A rectangular area of concrete and hardcore substrate was located at the entrance to the site off Sword's Road. Another entrance off Sword's Road is located to the south of the site, where a gravelled roadway/path ran across the southern section of the site.

This habitat is considered to be of less than local ecological importance.

GS1/ WS1 - Dry calcareous and neutral grassland /Scrub

Since its use as a construction site (2000-2006 for the Dublin Port Tunnel), the site has largely reverted to semi-natural grassland. Dry neutral grassland habitat (Figure 5-9) and scrub comprises most of the site. Plants include Cock's Foot *Dactylis glomerata*, Perennial Rye Grass *Lolium perenne*, Ragwort *Senecio Jacobea*, Willowherb *Ephelobium* spp., Thistle *Cirsium* spp., Speedwell *Veronica* spp., Dock *Rumex* spp., Creeping Buttercup *Ranunculus repens*, Cow Parsley *Anthriscus sylvestris*, Ribwort Plantain *Plantago lanceolata*, Wild Carrot *Daucus carota*, Oxeye Daisy *Leucanthemum vulgare*, Meadow Vetchling *Lathyrus pratensis*, Shaggy Hawkweed *Hieracium villosum*, Black Medick *Medicago lupulina*, Creeping cinquefoil *Potentilla reptans*, Marsh Woundwort *Stachys palustris* and Common Knapweed *Centaurea nigra*.

A wetter area of grassland/scrub occurred near the site entrance. Willow, Sharp Rush *Juncus acutus*, Horsetail *Equisetum* spp. and Pendulous Sedge *Carex pendula* were common here.

Scrub and young tree saplings were scattered throughout the site including Willows *Salix* spp., Silver Birch *Betula pendula*, Hawthorn *Crataegus monogyna*, Ash *Fraxinus excelsior*, Sycamore *Acer pseudoplatanus*, Blackthorn *Prunus spinosa*, Butterfly-bush *Buddleja davidii*, Bramble *Rubus fruticosus* agg., and Scot's Pine *Pinus sylvestris*. A few young Ash saplings, some covered with Ivy *Hedera Hibernica*, occurred along the south boundary. Many young Palm (Cabbage palm) *Cordyline australis* were scattered near the entrance to the site. Virginia Creeper *Parthenocissus quinquefolia* grows along the wall in the south eastern end of the site.

There were some cut tree trunks along the western boundary, evidence of trees having been there in the past.

A number of mature trees were located outside the site boundary, with Holm Oak to the south of the site, and two single mature specimens of Ash and Sycamore located just outside the boundary fence at the north of the site, near the site entrance on Sword's Road. These two trees were heavily covered in Ivy and the Ash had been previously topped.

Though not quite a brown field site, Dublin City Council Biodiversity Action Plan 2015-2020 (Dublin City Council, 2016) recognises that "there are other habitats that support rare species which would not typically be recognised as a 'valuable' wildlife habitat" for example, the vertical faces of walls, or vacant brown field sites'. Brown field sites are also considered in the new Draft Dublin City Biodiversity Action Plan 2021-2025 (Dublin City Council, 2021) as providing scrubland and native flora for wildlife.

This habitat is considered to be of county ecological importance due to the wide range of species present on site and the habitat is identified as valuable within the Biodiversity Action Plan.



Figure 5-9: Grassland within the site.

ED3 - Recolonising bare ground

Since its use as a construction site for the Dublin Port Tunnel the site has largely reverted to semi-natural grassland, but revegetated earth banks and partially recolonised bare ground were recorded along the western boundary of the site, evidence of previous construction works.

Previous excavated areas and soil heaps on the site have revegetated with Winter Heliotrope *Petasites pyrenaicus*, Red Dead Nettle *Lamium purpureum*, Mustard *Sisymbrium* spp., Fumitory *Fumitaria* spp., Charlock *Sinapis arvensis*, Colt's-foot *Tussilago farfara*, Alexanders *Smyrniolum olusatrum*, Nettle *Urtica dioica*, Dandelion *Taraxacum* spp., Thistle, False Oat-grass *Arrhenantherum elatius*, Ragwort, Cock's Foot, Yorkshire Fog *Holcus lanatus*, Creeping Buttercup, Docks *Rumex* spp., Creeping Bent *Agrostis stolonifera*, Hogweed *Heracleum sphondylium*, Willowherb, with Privet *Ligustrum* spp. and *Cotoneaster* spp. in places. Mosses and Stonecrop *Sedum rupestre* occurred on areas of concrete at the south east of the site.

This habitat is considered to be of local (higher value) ecological importance given the diversity of flowering plants providing habitat for pollinating insects.

ED2 - Spoil and bare ground

In connection to the southern access road there is an area of spoil and bare ground bound by a couple of spoil heaps which are revegetated. There is some vegetation occurring in this area, including Willowherb, Dandelion, Red Clover *Trifolium pratense* and Ribwort Plantain.

Along the northern boundary is a strip of bare ground across the site from east to west.

This habitat is considered to be of less than local ecological importance.

BL1- Stone walls and other stonework

Stone walls run along the eastern and western side of the boundary. The eastern boundary wall runs along the Swords Road. The western boundary wall marks the boundary towards Beech Lawn Nursing Home. Some Ivy grows in the eastern stone wall.

This habitat is considered to be of less than local ecological importance.

WS2 - Immature woodland

There is an area of immature woodland, consisting of Elm *Ulmus* spp., next to the eastern boundary. These trees were recorded during the survey in September 2021 and are about one year old as they were not present during the survey undertaken in February 2020.

This habitat is considered to be of less than local ecological importance.

Protected and Notable Species

NBDC records of protected flora and fauna including birds, amphibians, fish and mammals collated from the NBDC (2022) database, present within the 2km grid squares (O13T, O13U) within the past 10 years are listed in Appendix 5.1. This table includes their level of protection, if they are red or amber listed on the International Union for the Conservation of Nature and Natural Resources (IUCN) Red List and the date of the last record of this species at this location.

The surrounding 10km includes both terrestrial and marine habitats. However due to the urban nature of the site many of the species recorded within 10km are not expected to occur within the site.

Flora

There were no plant species listed under the Flora (Protection) Order 2015 found during the ecological walkover survey carried out in February 2020 or the follow up survey in September 2021.

There are no threatened or protected plant species recorded on NBDC website within the 2km grid squares.

Fauna

Terrestrial mammals

No protected species were recorded during the site visit. A single mammal hole was recorded in an earth bank, evidence of a small mammal, likely Rabbit *Oryctolagus cuniculus* (Figure 5-10). Mammal tracks were evident through the vegetation, particularly in the south and west of the site.

European Hedgehog *Erinaceus europaeus* and Red Squirrel *Sciurus vulgaris* have been recorded on the NBDC website within the two 2km grid squares surrounding the site (NBDC, 2022). While European hedgehog is likely to occur within the site, the Red Squirrel is not considered to occur within the site given that it is strongly associated with woodlands which is not present within the site.

Other protected species likely to use the site occasionally are Pygmy Shrew *Sorex minutus* and Badger *Meles meles*. While no signs of these species were recorded, the site is considered to provide suitable habitat for these species.

The site is considered to be of local (higher value) ecological importance for Hedgehog, Pygmy Shrew and Badger.



Figure 5-10: Entrance to mammal hole (left) and mammal tracks in vegetation (right).

Bats

Bat Roost Suitability

A short treeline at the south of the site, outside the boundary, was deemed to be of negligible value for roosting bats. The largest tree was a mature Holm Oak *Quercus ilex*, with no hollows and no Ivy growing on it, and is thus considered to offer negligible bat roost potential.

At the north-west corner, by the entrance but outside of the site boundary, is a mature Sycamore and a mature Ash. Both trees have a thick Ivy growth. The Ash has previously been topped but is still alive. The Sycamore and the Ash offer moderate and low bat roost potential respectively (Figure 5-11).

Therefore, bats in terms of roosting habitat are considered to be of local (lower value) ecological importance.



Figure 5-11: Ash and Sycamore trees at site entrance, just outside site boundary.

Foraging and commuting habitat

The site is not bounded by any treeline or hedgerow and such features are scarce in the immediate area. The site is bounded by stone walls along the western and eastern boundary which bats could use for commuting. The transect survey recorded two bat species, namely Common Pipistrelle *Pipistrellus pipistrellus* and Soprano Pipistrelle *Pipistrellus pygmaeus*, that were observed foraging within the site (Table 5-10). One visual observation of a bat was recorded without echolocation and thus the species could not be identified. Two recordings of Pipistrelle *Pipistrellus* spp. was made, which could be either Common Pipistrelle or Soprano Pipistrelle.

Species	Number recorded	Observation
Common Pipistrelle	13	Foraging over grassland, along eastern and northern boundary.
Soprano Pipistrelle	2	Foraging
Pipistrelle spp.	2	-
Not identified	1	Visual observation only. South west gate.

Table 5-10: Bats recorded during the transect survey carried out on the 7th September 2021.

The results from the static bat detector that was installed on site between 7th and 14th September 2021 are shown in Table 5-11. A total of three bat species were recorded, in addition to Common Pipistrelle and Soprano Pipistrelle, it also recorded Leisler's Bat *Nyctalus leisleri*. A few bat calls belonging to Pipistrelle spp., being either Common Pipistrelle or Soprano Pipistrelle, and social calls were also recorded.

Species	07 Sept	08 Sept	09 Sept	10 Sept	11 Sept	12 Sept	13 Sept	14 Sept	Total
Common Pipistrelle	19	17	25	11	12	7	4	25	120
Leisler's Bat	1	2	3	1	4	1	-	2	14
Pipistrelle spp.	-	-	-	6	1	1	-	-	8
Social call	-	1	4	1	-	-	-	1	7
Soprano Pipistrelle	3	6	1	37	4	-	2	1	54
Total	23	26	33	56	21	9	6	29	203

Table 5-11: Bat species and counts recorded by the static detector installed within the proposed site during the nights between 7th and 14th September 2021.

Evaluating the site's importance for commuting and foraging bats

The value of the foraging and commuting importance of the site (Table 5-12) is determined by the commonality of the bat species, the number of bats, the presence of roosts, and the structures and features of the habitats used for foraging and commuting. The evaluation is based on the guidance "Valuing Bats in Ecological Impact Assessment" (Wray et al., 2010).

Value	Commuting			Foraging		
	Common Pipistrelle	Soprano Pipistrelle	Leisler's	Common Pipistrelle	Soprano Pipistrelle	Leisler's
Species	2	2	2	2	2	2
Number of bats	10	5	5	10	5	5
Roosts nearby	3	3	1	3	3	1
Habitat/ Features	2	2	2	3	3	3
Score	17	12	10	18	13	11
Importance	Local importance			Local importance		

Table 5-12: Evaluation of parameters based on the guidance "Valuing Bats in Ecological Impact Assessment" (Wray et al., 2010).

Reasoning: Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat are the commonest bat species in Ireland. The transect survey and static detector recorded a moderate number of Common Pipistrelle and small number of calls from Soprano Pipistrelle and Leisler's Bat (static detector only). The site itself does not offer any roost potential, but the two mature trees north west of the site provide low to moderate bat roost potential. The site has low value as commuting habitat due to the lack of good quality linear features, the walls along the eastern and western boundary of the site are the only linear features present and treelines/hedgerows are scarce in the area.

Foraging habitat is sparse in this urban area, however smaller parks, e.g. Ellenfield Park (to north), Albert College Park (to west) and Highfield Healthcare Nursing Home (to south) are present in the vicinity of the site.

The evaluation of these parameters indicate that the site is of local importance for commuting and foraging for Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat. Therefore, bats in terms of foraging and commuting are considered to be of local (higher value) ecological importance.

Breeding Birds

No birds were recorded landed within the site on the day of the site visits. Seagulls and a Buzzard *Buteo buteo* were seen flying overhead. A flock of Starlings *Sturnus vulgaris* was recorded on the wires of nets in the adjacent grass pitches.

A large bird pellet was found within the site which could belong to any number of large birds (Gull, Heron, Owl). A pellet consists of indigestible parts of prey that are coughed up through the beak.

The trees at the north and south of the site (but just outside the boundary) and the scrub habitat are potential habitats for breeding birds. Small birds may feed on seed heads of grassland species such as Knapweed.

Breeding birds are considered to be of local (higher value) ecological importance.

Wintering Birds

Light-bellied Brent Goose are known to frequent large parks in Dublin to graze on short turf grass during the latter half of the winter months. However, the grassland at the proposed development site was considered unsuitable foraging habitat due to the unmanaged rough grass and scrubby habitat of the site. Brent Goose favour close cropped amenity grassland. The history of the site as a Dublin Port Tunnel construction site (2000-2006) and then as unmanaged grassland/scrub over the last number of years, would tend to preclude such birds. North of the site is a GAA pitch which would be more suitable habitat for the Brent Goose (Figure 5-12). Neither of the grasslands were recorded to be used by the Brent Goose or any other wintering bird during the wintering bird flight line survey carried out between December 2021 and February 2022.



Figure 5-12: Proposed development site (a) and GAA pitch north of site (b).

During the flight line surveys, Brent Goose were observed flying over the site on a number of occasions, though most of the observations recorded the geese flying further south of the site. Of a total of 19 observations of Brent Goose movement over the whole period, five of these were over the proposed site. On five survey dates (01/12/2021, 15/12/2021, 05/01/2022, 18/01/2022 and 10/02/2022) no geese were observed flying over the site. When the geese were observed, they were seen flying either in a westerly direction or easterly direction, which is in line with existing knowledge of their behaviour, geese from the population at North Bull Island fly to inland grasslands to feed. The geese observed during the surveys tend to land at DCU sport grounds and Erin's Isle GAA located further west from the site, which was confirmed by observers at these locations. During the last survey, 23/02/2022, Brent Goose flying over the site were observed to land on the grounds of Clonturk Community College which was also confirmed by a spot check after completing the survey. This was the only time Brent Goose were noted at Clonturk Community College during these surveys. At St. Vincent's GAA sports fields one Brent Goose and nine Oystercatchers *Haematopus ostralegus* were noted during one of the spot checks, 09/12/2021.

A summary of the results of Light-bellied Brent Goose flying over the proposed development site is provided in Table 5-13 below and the full flight line survey results are provided in Appendix 5.2.

Date and time of day	Count	Number of flocks	Estimated height over site
09-12-2021 dawn	20	1	15m
02-02-2022 dawn	50	1	15m
23-02-2022 dawn	7	1	25m
23-02-2022 dawn	80	2	20m
23-02-2022 dawn	23	1	20-25m

Table 5-13: Summary of results of Brent Goose flight line survey with observations of in-flight over the proposed site.

Brent Goose were observed flying over the site at three out of eight survey occasions (37.5% of the surveys). For two of these three occasions, only one flock was observed. More frequent observations were made on the 23rd of February where flocks were observed several times during the 2-hour survey period. During a total of 16 hours of survey, Brent Goose were observed at five separate occasions over the site and the time spent over the site was generally less than 5 seconds on each occasion.

The Light-bellied Brent Goose population at North Bull Island SPA (which is the population that forage inland across north Dublin) was 3,443 for the period 2006/07 – 2010/11 (based on mean peak for the period) (NPWS, 2014). Recent counts for Dublin Bay (I-WeBS site 0U4040) is 3,453, based on mean peak for the five-year period 2015/16 – 2019/20 (Bird Watch Ireland, 2022). This indicates that birds observed flying over the proposed site during the surveys represents less than 3% of the population and the number of individuals is considered to be low.

The estimated flight height recorded during the flight line survey was between 15-25m and the general height of the proposed buildings on site is between 20.37m – 26.75m. This means that the flight height was within the height of the proposed buildings.

Considering the sites low suitability in providing habitat for wintering birds and the low number of wintering birds (Brent Goose) flying over the site, wintering birds are considered to be of local (higher value) ecological importance.

Invertebrates

Invertebrates were not surveyed for during the site visit. However, the semi-natural grassland/scrub habitat, such as exists on the site, would provide supporting habitat for bees, butterflies and insects such as beetles.

This type of habitat is considered within the Dublin City Biodiversity Action Plan 2015-2020 and 2021-2025 as a valuable habitat providing scrubland and native flora for wildlife.

Three species of insects listed as near threatened have been recorded on the NBDC website within the two grid squares. These species are Small Heath *Coenonympha pamhilus* (butterfly), Large Red Tailed Bumble Bee *Bombus (Melanobombus) lapidarius* and Moss Carder-bee *Bombus (Thoracombus) muscorum*.

Insects are considered to be of county ecological importance within the site given the suitability of the habitat and its recognition within the Biodiversity Action Plan.

Invasive Non-native Species

A number of Invasive Non-native Species (INNS) were recorded within the site during the site visits. These included species of medium to low impact: Butterfly-bush *Buddleja davidii*, Winter Heliotrope *Petasites pyrenaicus* and *Cotoneaster* spp. (Figure 5-13). No species on the Third Schedule of non-native species subject to restrictions under Regulations 49 and 50 were recorded. Maintaining site hygiene at all times in an area where INNS are present is essential to prevent further spread.



Figure 5-13: Winter Heliotrope (left) and Cotoneaster with Privet (right).

The records of INNS of plants collated from the (NBDC, 2022) database, present within the 2km grid square within the past 10 years are listed *Table 5-14* below. The species listed are either listed on the Third Schedule under Regulations 49 and 50 of S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011 or designated as High impact Invasive Species. A full list of all recorded INNS species is provided in Appendix 5.3.

Invasive Non-native Species	Listed on the 3rd Schedule	High Impact Species
Giant Hogweed <i>Heracleum mantegazzianum</i>	Yes	Yes
Indian Balsam <i>Impatiens glandulifera</i>	Yes	Yes
Japanese Knotweed <i>Reynoutria japonica</i>	Yes	Yes
Three-cornered Garlic <i>Allium triquetrum</i>	Yes	No

Table 5-14: Invasive Non-native Species within 2 km² grid squares of the proposed site.

Screening of Ecological Features

The screening of ecological features is given in *Table 5-15*. Those features screened out are not considered further in this assessment. Ecological features that are screened in are assessed for potential impact during construction and operation in the following sections.

Ecological feature	Value	Screening	Reasoning
Santry Demesne pNHA	National	Screened out	No link with the site
Royal Canal pNHA	National	Screened out	No link with the site
North Dublin Bay pNHA	National	Screened out	Part of North Dublin Bay SAC and covered within the AA Screening.
Grand Canal pNHA	National	Screened out	No link with the site
Dolphins, Dublin Docks pNHA	National	Screened out	No link with the site
South Dublin Bay pNHA	National	Screened out	Part of South Dublin Bay SAC and covered within the AA Screening.
Feltrim Hill pNHA	National	Screened out	No link with the site
Baldoyle Bay pNHA	National	Screened out	Part of Baldoyle Bay SAC and covered within the AA Screening.

Ecological feature	Value	Screening	Reasoning
Liffey Valley pNHA	National	Screened out	No link with the site
Sluice River Marsh pNHA	National	Screened out	No link with the site
Boosterstown Marsh pNHA	National	Screened out	No link with the site
Malahide Estuary pNHA	National	Screened out	Part of Malahide Estuary SAC and covered within the AA Screening.
Howth Head pNHA	National	Screened out	Part of Howth Head SAC and covered within the AA Screening.
Buildings and artificial surfaces	Less than local	Screened out	Low value
Dry calcareous and neutral grassland/Scrub	County	Screened in	
Recolonising bare ground	Local (higher value)	Screened in	
Spoil and bare ground	Less than local	Screened out	Low value
Stone walls and other stonework	Less than local	Screened out	Low value
Immature woodland	Less than local	Screened out	Low value
Protected flora	Less than local	Screened out	No protected or threatened species recorded.
Hedgehog, Pygmy Shrew and Badger	Local (higher value)	Screened in	
Bats - roosting	Local (lower value)	Screened in	
Bats – commuting and foraging	Local (higher value)	Screened in	
Breeding birds	Local (higher value)	Screened in	
Wintering birds – Brent Goose	Local (higher value)	Screened in	
Invertebrates	County	Screened in	
Invasive Non-native Species	-	Screened in	

Table 5-15: Screening of ecological features.

5.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will consist of the construction of 7 no. blocks in heights up to 8 storeys (over single level basement) comprising 472 no. apartment units, a creche, café unit, and internal residential amenity space. The proposal also includes car, cycle, and motorcycle parking, public and communal open spaces, landscaping, bin stores, plant areas, substations, switch rooms, and all associated site development works and services provision. Access is provided from the development from Swords Road with associated upgrades to the existing public road and footpaths. A full description of the development is provided in the statutory notices and in Chapter 3 of the EIAR submitted with the application.

In relation to biodiversity, the proposed development will include the removal of topsoil and sub soil, removal of vegetation and loss of habitats within the site. The construction of new residential buildings and provision of lighting is also assessed in relation to biodiversity. The following section describes the potential impacts arising from the proposed development which has been assessed as part of this EIAR.

5.5 POTENTIAL IMPACTS

The impacts on the valued ecological features are assessed here. The initial assessment considers the potential impact pathways and whether these apply to the ecological features. The impact assessment considers the project and the anticipated effects in the absence of any mitigation.

The following sections described the nature of immediate / short-term impacts, as well as any medium- or long-term impacts, predicted for habitats and species in the absence of implemented mitigation measures during the construction phase and operational phase.

Construction Phase

Dry calcareous and neutral grassland / Scrub; Recolonising bare ground

This habitat will be removed due to site clearance to allow for the new development. The grassland and recolonising bare ground have a good plant diversity and provide habitat for pollinating insects, such as bees and butterflies, and bats for which the insects are prey. Natural sites that provide habitat for pollinators are decreasing and the grasslands nearby the proposed site are mown regularly and does not provide as good habitat as is present on site. The proposed construction works would result in a direct loss of habitat and have an indirect impact on pollinators using the site.

The unmitigated effect of this development during construction would result in minor to moderate long-term impact to these habitats of county and local importance.

Hedgehog, Pygmy Shrew and Badger

No protected species were recorded within the site, however suitable habitat for Hedgehog, Pygmy Shrew and Badger is present and the species are likely to use the site to some extent for commuting and foraging. In the absence of mitigation there is the potential for the following impacts:

- Direct loss of species during site clearance work.
- Loss of habitat and foraging area.
- Increased noise and human activity within the site during the period of the proposed works.

Although this group of species are generally mobile, construction impacts attributed to noise and vegetation removal must be considered. Habitat removal would afford a negative effect on local mammal populations, resulting in reduction of commuting and foraging habitat. Removal of vegetation during winter months could also result in direct mortality of hibernating Hedgehogs as they hibernate in piles of leaves and logs. While noise disturbance will increase during the construction and cause disturbance to the species, these impacts will be temporary.

The unmitigated effect of this development during construction would result in minor short to medium-term impact to this species group of local importance.

Bats – roosting

No roosting features were identified within the site. Therefore, there will be no loss of roosting habitat due to the development. However, there are two mature trees outside of the site boundary, in the north west corner of the site. While they will not be removed due to the construction, there is the potential for direct physical disturbance by construction machinery given they are adjacent to the proposed site. However, this is not anticipated to significantly impact on potential roosting habitat.

Lighting during construction could impact on the quality of the roosts if there is light spill on to the two trees, however this would be temporary during construction.

The unmitigated effect of this development during construction would result in negligible temporary impact to bats roosting habitat which is of local importance.

Bats – commuting and foraging

The removal of vegetation on site will result in the loss of bat foraging and commuting habitat within the site and may reduce the connectivity between nearby suitable habitat, e.g. Ellenfield Park and Albert College Park. The unmitigated effect of this development during construction would result in long-term minor impact to this species group of local importance due to the loss of foraging and commuting habitat.

Increased noise and human activity associated with the works would be temporary during daytime and no nocturnal noise effects are anticipated. Out of hours work might be required in some circumstances and lighting during the hours of darkness has the potential to reduce the quality of adjacent foraging and commuting habitat. In the absence of mitigation, the reduced habitat quality due to lighting will be negligible to this species group, due to the temporary nature of the construction phase.

Breeding birds

The potential for ecological impact to breeding birds, in the absence of mitigation focuses on the following factors:

- Construction noise disturbance.
- Removal of nesting and foraging habitats (scrub, grassland)

Noise, vibration and increased human presence associated with the construction phase has the potential to result in a disturbance impact to local breeding bird populations during the breeding season and has the potential to result in reduced breeding within the site. However, this impact is considered to be temporary, and in the light of the fact that all vegetation within the site will be removed, there will be no available nesting habitat within the site. There is the potential for physical disturbance if removal of nesting habitat is carried out during the breeding season.

Therefore, due to the removal of suitable bird habitat, the unmitigated effect of this development during construction would result in a negligible-minor, temporary to short-term impact to breeding birds of local importance.

Brent Goose

No Brent Goose or other wintering birds were recorded using the site. The construction phase of the project is not anticipated to impact on wintering birds.

Invertebrates

The grassland and recolonising bare ground provide good foraging habitat for pollinating insects. The removal of this habitat will result in the loss of pollinator habitat, which is becoming increasingly scarce in the urban environment where less intensely kept grasslands are replaced with mown lawns which have a limited value for pollinators.

The unmitigated effect of this development during construction would result in a moderate long-term impact to this species group of county importance.

Invasive Non-native Species

The construction of the proposed development will involve movement of machinery and soil over a period of 30 months. While neither Butterfly-bush, Winter Heliotrope or Cotoneaster are invasive species listed on the Third Schedule of the EU Habitats Directive, they could be spread within the site when topsoil is stripped and moved around within the sites. This could result in the species competing with plants proposed within the planting scheme of the development.

Operational Phase

Hedgehog, Pygmy Shrew and Badger

The potential ecological impact to these species during operation would be through operational noise disturbance and human activity, and the reduction of available habitat and potential habitat fragmentation.

Noise effects and human activity associated with the operation of the development would be temporary and intermittent during daytime and no nocturnal noise effects are anticipated. In the absence of mitigation, disturbance would have a negligible impact on these species.

The unmitigated effect of this development during operation would result in a long-term minor impact to this species group of local importance due to reduction and fragmentation of suitable habitats.

Bats – roosting

Lighting within the site has the potential to light up the trees with potential roosts outside of the site and reduce the quality of these trees as roosting features. This can result in the bats become averse from using the site.

The unmitigated effect of this development during operational phase would result in long-term minor impact to bats roosting, which is of local importance.

Bats – commuting and foraging

The reduction of commuting and foraging habitat to bats in combination with operational lighting of the site during hours of darkness could result in fragmentation of suitable habitats outside of the site.

Bats habiting the area would be used to human presence and noise disturbance given the urban landscape and the busy roads in the vicinity and most human activity within the site would be during daytime hours. Therefore, mitigation measures for disturbance are not required.

The unmitigated effect of this development during operational phase would result in minor long-term impacts to this species group of local importance due to reduction and fragmentation of suitable habitats.

Breeding birds

Noise and increased human presence during the operational phase could potentially result in disturbance to local breeding bird populations during the breeding season. However, noise disturbance is unlikely to cause stress to this species group given the urban setting and the impact is anticipated to be negligible.

Brent Goose

The proposed development has been identified to be within the flight lines of Brent Goose to/from roost/feeding sites and has the potential to impact on their flight lines due to the introduction of proposed 6-8 story buildings within the site.

The Brent Goose did not fly over the site on a regular basis, the majority of the observations recorded the birds flying further south of the site and the number of birds flying over the site was low (less than 3% of the North Bull Island SPA population).

The estimated flight height over the site varied between 15-25m which is within the height of the proposed buildings (20.37-26.75m). The buildings may impact on Brent Goose trying to land on grasslands close to the proposed site, which is mainly lands of Clontarf Community College, as they fly lower when they prepare to land on a site. However, given the limited use of the fields at Clontarf Community College (Brent Goose were only observed to forage on one occasion) and the low buildings to south of the site and open fields (GAA grounds) and low buildings to the north, the impact will not be significant.

The unmitigated effect of this development during the operational phase would have a negligible impact on Brent Goose.

Invertebrates

Reduction of available habitat in the urban setting could impact on the wider insect population and it is important to consider that not all planted plants are suitable to pollinators. The unmitigated effect of this development would result in a moderate long-term impact to this species group of county importance.

5.6 POTENTIAL CUMULATIVE IMPACTS

Potential sources of cumulative impacts were identified based on the ecology of valued ecological features. Potential sources of cumulative impacts were sought within areas where there is the potential for a significant impact on a site or species. The following plans and projects were identified as potential sources of cumulative impacts or in-combination impacts:

Dublin City Development Plan (2016-2022)

Dublin City Development Plan 2016-2022 sets out aims policies and objectives for the proper planning and sustainable development in the city. The Plan seeks to develop and improve, in a sustainable manner, the social, economic, cultural and environmental assets of the City (Dublin City Council, 2016).

To achieve a green, connected City and more sustainable neighbourhoods in line with the core strategy of the Plan the strategic approach will aim at (Dublin City Council, 2016):

- Implementing a ‘green infrastructure’ strategy
- Creating sustainable connectivity between green areas
- Providing for the recreational and amenity needs of the population

It is the policy to develop the green infrastructure network through the city where linear parks and waterways play an important role in connecting existing open spaces.

Policies and objectives of the City Development Plan relating to the protection of biodiversity within the city are outlined below:

- GI2: That any plan/project, either individually or in combination with other plans or projects that has the potential to give rise to significant effect on the integrity of any European site(s), shall be subject to an appropriate assessment in accordance with Article 6(3) and 6(4) of the EU Habitats Directives.
- GI4: To co-ordinate open space, biodiversity and flood management requirements, in progressing a green infrastructure network.
- GI10: To continue to manage and protect and/ or enhance public open spaces to meet the social, recreational, conservation and ecological needs of the city and to consider the development of appropriate complementary facilities which do not detract from the amenities of spaces.
- GI23: To protect flora, fauna and habitats, which have been identified by Articles 10 and 12 of Habitats Directive, Birds Directive, Wildlife Acts 1976–2012, the Flora (Protection) Order 2015 S.I No. 356 of 2015, European Communities (Birds and Natural Habitats) Regulations 2011 to 2015.
- GI24: To conserve and manage all Natural Heritage Areas, Special Areas of Conservation and Special Protection Areas designated, or proposed to be designated, by the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
- GI25: To make provisions for habitat creation/ maintenance and facilitate biodiversity by encouraging the development of linear parks, nature trails, wildlife corridors, urban meadows and urban woodlands.
- GI26: To have regard to the conservation and enhancement of significant non-designated areas of ecological importance in accordance with development standards set out in this plan.
- GI27: To minimise the environmental impact of external lighting at sensitive locations to achieve a sustainable balance between the needs of an area, the safety of walking and cycling routes and the protection of light sensitive species such as bats.
- GI28: To support the implementation of the Dublin City Tree Strategy, which provides the vision for the long-term planting, protection and maintenance of trees, hedgerows and woodlands within Dublin City.
- GI29: To adopt a pro-active and systematic good practice approach to tree management with the aim of promoting good tree health, condition, diversity, public amenity and a balanced age-profile.
- GIO1: To integrate Green Infrastructure solutions into new developments and as part of the development of a Green Infrastructure Strategy for the city.
- GIO2: To apply principles of Green Infrastructure development to inform the development management process in terms of design and layout of new residential areas, business/ industrial development and other significant projects.
- GIO17: To seek the continued improvement of water quality, bathing facilities and other recreational opportunities in the coastal, estuarine and surface waters in the city and to protect the ecology and wildlife of Dublin Bay.

- GIO23: To support the implementation of the ‘Dublin City Biodiversity Action Plan 2015–2020’, including inter alia (a) the conservation of priority species, habitats and natural heritage features, and (b) the protection of designated sites.
- GIO24: To develop Biosecurity Codes of Practice to deal with invasive species and ensure compliance with EU (Birds and Natural Habitats) Regulations 2011 and EU Regulations 2014 on the prevention and management of the introduction and spread of invasive alien species.
- GIO27: To protect trees, hedgerows or groups of trees which function as wildlife corridors or ‘stepping stones’ in accordance with Article 10 of the EU Habitats Directive.

The City Development Plan is designed to be taken in conjunction with other similar plans and programmes, to have the overall effect of strengthening the management of and enhancing the protection and conservation of Natura 2000 sites (SACs and SPAs). Specific statements, policies and objectives are formulated within the Plan to allow the Council to take appropriate steps to avoid the deterioration of Natura 2000 sites.

Dublin City Council will prepare a number of local environmental improvement plans or village improvement plans, or other appropriate plans in conjunction with the local area committee, in so far as priorities and resources permit (see Section 2.2.8.1, Dublin City Council, 2016). Whitehall is one of these areas. There are no plans submitted at present.

Whitehall Framework Plan (Dublin City Council, 2008)

The area to the north of the site and west of the football pitch has been identified for development as part of the Whitehall Framework Plan (Dublin City Council, 2008). There are no plans submitted at present, therefore no cumulative impacts can be assessed.

Other Projects

Since February 2019, the projects listed below (Table 5-16) which could act in-combination with the proposed development, which are not retention applications, home extensions and/or internal alterations, have been granted planning permission in the locality of the proposed site.

Planning Reference	Address	Application Status	Decision date	Summary of development
2536/21	Whitehall Colmcille GAA, Collins Avenue, Whitehall, Dublin 9	GRANT PERMISSION	2021-09-15	Planning permission for the development will consist of a sports skills wall at 5m in height, 2 no. artificial grass courts (overall area 353m ²) including boundary walls and fencing with ball stop netting around the perimeter at 5m in height and the installation of new floodlighting to the north and south perimeters of the proposed courts as well as all associated site and landscaping works.

Table 5-16: Projects granted planning permission since February 2019 in vicinity of the proposed site.

Assessment of Potential Cumulative Impacts

Potential cumulative impacts upon local flora and fauna include loss of foraging, resting and commuting habitat, construction noise and lighting pollution.

The Dublin City Development Plan (2016-2022) sets out policies and objectives for a sustainable development in the city and aim to improve environmental assets of the city, thus the plan is not expected to have a cumulative impact on the proposed development.

The only other project in the vicinity of the site identified to potentially act in-combination with the proposed development is application 2536/21 at Whitehall Colmcille GAA directly north east of the site which involves the installation of new floodlighting to the north and south of the perimeters. The floodlighting could have a cumulative impact with proposed lighting of the site on bats commuting and foraging in the area. However, conditions in relation to the 'Grant Permission' include the restriction of use of the floodlights where they shall not be used between 22:00 – 10:00 Monday to Sunday. The lights will be directed and cowled to reduce light scatter over adjacent lands, houses and gardens. These conditions will also minimise impact on bats in the area and cumulative impacts with the proposed development at Hartfield Place are not anticipated.

5.7 MITIGATION MEASURES

Construction Phase

Hedgehog, Pygmy Shrew and Badger

Although disturbance to wildlife during the construction work will be temporary, general avoidance measures should be undertaken to protect wildlife while the works are being carried out.

General avoidance measures that should be incorporated by the contractors working on site include:

- Limit the hours of working to daylight hours, where possible, to limit disturbance to nocturnal and crepuscular animals;
- Due to the potential presence of Badger; Hedgehog; and Pygmy Shrew, the use of lighting at night should be avoided. If the use of lighting is essential, then a directional cowl should be fitted to all lights to prevent light spill and to be directed away from retained vegetation;
- Contractors must ensure that no harm comes to wildlife by maintaining the site efficiently and clearing away materials which are not in use, such as wire or bags in which animals can become entangled; and
- Any pipes should be capped when not in use (especially at night) to prevent animals becoming trapped. Any excavations should be covered overnight to prevent animals from falling and getting trapped. If that is not possible, a strategically placed plank should be placed to allow animals to escape.

Bats – roosting, commuting, and foraging

The use of lighting at night during construction should be avoided. If the use of lighting is essential, there will be no lighting of the two mature trees with bat roost potential in the north west corner outside of the site boundary by the use of directional lighting.

Breeding birds

Removal of trees and scrub will be conducted outside of the bird nesting season (March to August inclusive). If this is not possible, a breeding bird survey by an appropriately qualified ecologist will be undertaken in advance of the works to ensure that there will be no impacts on nesting birds. If nests are found, they will be safeguarded, with an appropriate buffer, until the chicks have successfully fledged.

Invasive Non-native Species

As Winter Heliotrope occurs extensively along the western boundary, it should be managed prior to clearance of vegetation and works commence in the area. Winter Heliotrope should be removed and appropriately disposed to avoid further dispersal of the species. Removal of Winter Heliotrope can be done by either physical control or chemical control. Due to an extensive rhizome network, physical removal is only practical on a limited scale. The Winter Heliotrope is extensive on the present site and as such chemical control is the preferred option.

Chemical control: Application of a glyphosate-based herbicide will be carried out after flowering in February to March, or in mid to late summer before the foliage begins to die back. All Plant Protection Products will be used in accordance with the product label and with Good Plant Protection Practice as prescribed in the European Communities (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003). It is an offence to use Plant Protection Products in a manner other than that specified on the label (NRA, 2010). Follow-up will be carried out with foliar spray, wiper applicator or spot treatment. Control measures are based on "Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads" (NRA, 2010).

Butterfly Bush and Cotoneaster are scattered throughout the site. They should be managed prior to clearance of vegetation and works commence in the area. Both species should be removed and appropriately disposed to avoid further dispersal of the species in the soil. Mechanical methods of control comprise pulling young seedlings and excavating the root mass. Any material containing Butterfly Bush/Cotoneaster waste must be removed to licensed landfill as controlled waste.

Operational Phase

Dry calcareous and neutral grassland / Scrub; Recolonising bare ground; Insects

To mitigate for the loss of the diverse grassland and recolonising bare ground, which provides habitat for pollinating insects, the landscape masterplan provided by Park Hood Chartered Architects (drawing no. 7335—L-2005) incorporates pollinator friendly planting based on the "Pollinator Friendly Planting Code" in the "All Ireland Pollinator Plan 2015-2020. Native Irish wildflower meadows are proposed around the play area in the north next to Block F and in the south next to Block B, C and E.

The areas of native wildflower meadow will only undergo a late cutting (after July 15th) once each year. This benefits invertebrate species which need highly structured grassland vegetation for feeding and refuge. It also allows for late-flowering plants to set seed.

It is advisable to avoid cutting the whole meadow area at one time, but to spread the timing of the operation so as to avoid damaging the micro-fauna. Spreading cutting dates also prolongs the pollination phase of plants and the availability of nectar for invertebrates. For that reason, it is sensible to exclude from cutting a small proportion (5-10%) of the total area, cutting it the following summer. This should be done every year with a different part of the surface, on rotation, going back to any particular uncut patch of land every 4-6 years (Pearson et al., 2006; Calaciura and Spinelli, 2008).

Very low cutting heights should be avoided, as there is a likelihood of excessive "scalping" resulting in the creation of bare patches in the grassland. These provide favourable areas for the invasion of undesirable species (Calaciura & Spinelli, 2008).

Cut material can be left in place for a couple of days but should thereafter be removed to avoid nutrient enrichment of the grassland. Leaving the cut material in place is also considered to smother the grassland, depressing species richness (Crofts and Jefferson, 1999; Calaciura and Spinelli, 2008).

Hedgehog, Pygmy Shrew, Badger, Bats, Breeding birds

The landscape masterplan provided by Park Hood Chartered Architects (drawing no. 7335—L-2005) incorporates a wildlife corridor along the southern boundary and across the site at the back of Block F and G which connects areas to the south with areas to the north of the site. This wildlife corridor consists of trees and scrub to allow for safe commuting and foraging opportunities for mammals, bats and birds. It also provides nesting habitat for breeding birds.

Below is a list of the native trees and scrub to be planted and their biodiversity benefits:

- Hazel *Corylus avellana* - Provides food for the caterpillars of moths, suppling local birds and bats with prey. Additionally, hazelnuts are eaten by Greater Spotted Woodpecker *Dendrocopos major*, Wood Pigeon *Columba palumbus* and small mammals.
- Guelder Rose *Viburnum opulus* - The red berries are an important food source for birds and the shrub canopy provides shelter for a wide range of wildlife. The flowers are especially attractive to hoverflies.
- Spindle *Euonymus europaeus* – The flowers provide nectar for pollinators and the leaves are eaten by caterpillars of moths and other insects.
- Hawthorn *Crataegus monogyna* - Provides food for pollinators and caterpillars of moths, suppling local birds and bats with prey. The fruit haws are eaten by migrating birds, such as Redwings *Turdus iliacus* and Fieldfare *Turdus pilaris*, as well as small mammals.
- Holly *Ilex aquifolium* - Provides dense cover and good nesting opportunities for birds, while its deep, dry leaf litter may be used by Hedgehogs and small mammals for hibernation. Also supports pollinator species providing prey for bats and birds. Its berries are also an important food source for birds in the winter.
- Elder *Sambucus nigra* - The flowers provide nectar for a variety of insects and the berries are eaten by birds and mammals.
- Scots Pine *Pinus sylvestris* - Preferred by Red Squirrel *Sciurus vulgaris* for building dreys.
- Silver Birch *Betula pendula* - Supports numerous moth species supplying bats with prey. This species is also preferred by Greater Spotted Woodpecker for nest building. This has knock-on benefits for both Red Squirrel and bats species which occupy abandoned nests.
- Wild Cherry *Prunus avium* / Bird Cherry *Prunus padus* - Flowers support numerous pollinator species, while the fruits are often consumed by Badger, other small mammals and bird species
- Goat Willow *Salix caprea* - Provides food for pollinators and caterpillars of moths, suppling local birds and bats with prey. Generally preferred by a number bird species for nesting.
- Alder *Alnus glutinosa* - Supports diverse insect life, supplying local birds and bats with prey
- Sessile Oak *Quercus petraea* - Supports diverse insect life, suppling local birds and bats with prey. Additionally, the acorns are consumed by Red Squirrel and Badger. This species is also preferred by Greater Spotted Woodpecker for nest building. This has knock-on benefits for both Red Squirrel and bats species which occupy abandoned nests.

Bats - Lighting

The lighting of the site is designed to minimise impact on bats using the site for commuting and foraging and incorporates a dark corridor which allows bats to commute between sites in the wider landscape.

The following should be incorporated into the lighting design:

- Hours of illumination:
Site lighting should be switched off or at lower light output during inactive site hours where lighting is not necessary throughout the night; this would benefit the bats foraging and/or commuting in the locality.

Additionally, lighting should be controlled by occupancy / motion sensors so that it will remain off / low if there is no pedestrian traffic nearby.

- Light levels and type:
The specification and colour of light treatments, such as single bandwidth lights and no UV light are essential. LED luminaires should be used due to their sharp cut-off, lower intensity, and dimming capability. A warm white spectrum (2700K – 3000K) should be used to reduce the blue light component. Alternatively the LED luminaires could feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to the bats.
- Column heights of lamp posts:
In order to reduce the amount of light spillage where it is not needed, the height of lamp columns should be restricted. A height of 6m or less is necessary to avert lighting impacts.
- Dark corridors:
Taking into consideration all of the above recommended mitigation measures, a dark corridor (lighted in a bat-friendly manner) leading from one end of the site to the other, should be maintained for bats at all times (Figure 5-14). This will allow for bats commuting through the site to do so safely. This dark corridor will be present along the southern boundary of the site and across from south to north at the back of Block F and G. The corridor will have bat-appropriate lighting and linear tree and shrub vegetation. The bat friendly, low intensity site lighting allows for the bats to commute along and through the site between habitats in the wider landscape, such as Ellenfield Park, lands of Beechlawn Nursing Home and Clonturk Community College.

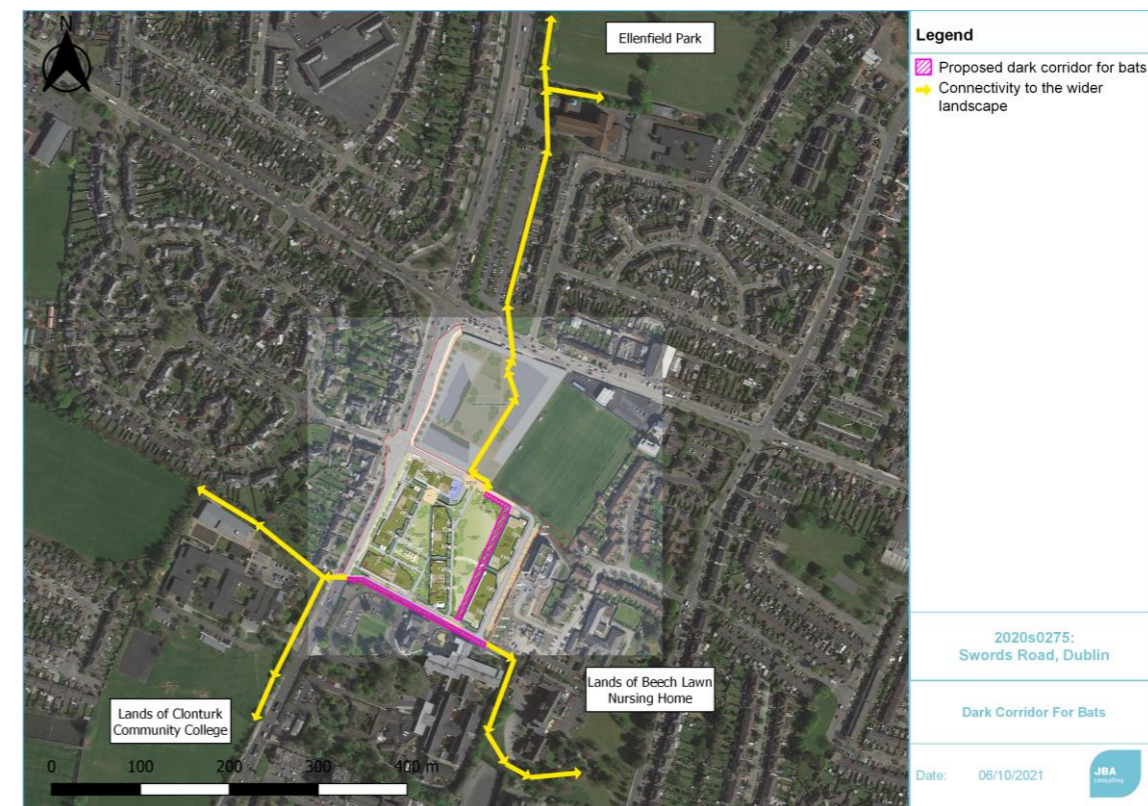


Figure 5-14: Proposed location of dark corridor and how it connects with the wider landscape. (ref. landscape architect)

5.8 PREDICTED IMPACTS

Construction Phase

The proposed development will require removal of vegetation within the site. This will result in the loss of dry grassland / scrub and recolonising bare ground habitats. The removal of vegetation could also affect wildlife, such as Pygmy Shrew, Hedgehog, Badger, bats, birds and insects by direct mortality, loss of potential roosting, nesting, commuting and foraging habitat. Implementation of mitigation measures during the construction phase includes clearing away of material not in use, covering of pipes to prevent animals getting trapped and removal of vegetation on a rotational basis to provide cover. Removal of vegetation will take place outside of the bird nesting season.

The loss of habitat will be temporary as mitigation measures are incorporated into the landscape masterplan for the operational phase of the site (see details in section below 'Operational Phase').

Artificial lighting during construction has the potential to impact on bats and other nocturnal species. Works will be restricted to daytime hours, however there might be a need for out-of-hours work in some circumstances where lighting is required. Any lighting used will be directed to avoid light spill where it is not necessary and there will be no lighting of the two mature trees with bat roost potential directly outside of the proposed site.

The predicted impact during the construction phase is assessed to be of negligible impact.

Operational Phase

The proposed development will result in fragmentation and a reduction of available habitat for mammals, including bats, birds and insects. Mitigation measures are incorporated into the landscape masterplan which includes a wildlife corridor along the southern end of the site and south to north through the site with planting of native trees and scrub. This will provide safe commute for mammals and foraging opportunities with the provision of fruits/berries and insects. Wildflower meadows with native Irish wildflowers will be planted in several places across the site which will provide habitat for pollinators.

Lighting within the site may impact on bats commuting and foraging within the site. Mitigation measures include a bat friendly lighting design which will provide a dark corridor along the wildlife corridor for bats to commute across the site.

The site was identified to be partly within the flight lines of Brent Goose. However, due to the restricted number of geese flying over the site, restricted use of Clonturk Community College for foraging and the presence of low buildings and open fields around the proposed site it is considered to have a negligible impact on Brent Geese.

Summary of Impact Assessment

The tables below present a summary of the assessment when mitigation approaches are considered and included. A more detailed description of mitigation measures is provided in the text above. Residual impacts are also described. Table 5-17 provides a summary of construction impact and Table 5-18 provides a summary of operation impacts.

Ecological Features	Importance of Feature	Potential Impact	Impact without Mitigation	Mitigation	Significance of Effects of Residual Impacts
Construction Impacts					

Dry calcareous and neutral grassland / Scrub	County	Loss of habitat	Long-term, Moderate impact	The landscape masterplan for the operational phase of the site incorporates native wildflower meadows within the site which will be managed once per year in order to support plant diversity and pollinating insects.	No significant residual impact
Recolonising bare ground	Local (higher)	Loss of habitat	Long-term, Minor impact		No significant residual impact
Mammals - Badger, Hedgehog, Pygmy Shrew	Local (higher)	Disturbance to commuting and foraging activities Harm to individuals Loss of habitat	Temporary, Minor impact Short-medium term, Minor impact	Follow measures outlined in Section 5.7, including limit work to daylight hours, any necessary lighting directed away from vegetation and ensuring pipes are capped and excavations covered during night to avoid mammals becoming entrapped.	No significant residual impact
Bats - roosting	Local (higher)	Physical disturbance and light disturbance of roost habitat	Temporary, Negligible impact	Follow measures outlines in Section 5.7. The use of lighting at night during construction should be avoided. If the use of lighting is essential, there will be no lighting of the two mature trees with bat roost potential in the north west corner outside of the site boundary by the use of directional lighting. The landscape masterplan for the operational phase of the site incorporates a wildlife corridor which will provide a commuting and foraging corridor for bats including treelines and shrubs with native species.	No significant residual impact
Bats – foraging and commuting	Local (higher)	Lighting disturbance Loss of commuting and foraging habitat	Temporary, Negligible impact Long-term, Minor impact		No significant residual impact
Breeding birds	Local (higher)	Noise and human activity disturbance Harm to individuals if vegetation is removed during nesting season	Temporary to short-term, Negligible to minor impact	Follow measures outlined in section 5.7. Vegetation should be removed outside of the bird nesting season (March to August 31st inclusive). If this is not possible, a breeding bird survey will be undertaken in advance of the works to ensure that there will be no impacts on nesting birds.	No significant residual impact
Brent Goose	Local (higher)	None identified	N/A	-	No significant residual impact

Invertebrates	County	Loss of habitat	Long-term, Moderate impact	The landscape masterplan for the operational phase of the site incorporates native wildflower meadows within the site which will provide habitat for pollinating insects. Further, several of the native trees and scrub to be planted also provide nectar to pollinators.	No significant residual impact
----------------------	--------	-----------------	----------------------------	--	--------------------------------

Table 5-17: Summary of construction impacts, mitigations and significance of residual impacts.

Ecological Features	Importance of Feature	Potential Impact	Impact without Mitigation	Mitigation	Significance of Effects of Residual Impacts
Operational Impacts					
Mammals - Badger, Hedgehog, Pygmy Shrew	Local (higher)	Habitat reduction and fragmentation	Long-term, Minor impact	The landscape masterplan for the operational phase of the site incorporates a wildlife corridor with native treelines and scrub allowing mammals to safely commute and provides forage opportunities within the site.	No significant residual impact
Bats - roosting	Local (higher)	Lighting disturbance of roost habitat	Long-term, Minor impact	Follow measures outlines in Section 5.7. Lighting within the site designed in a bat friendly manner, including the use of LED luminaires with a warm white spectrum (2700-3000K), column heights restricted to 6m and the provision of a dark corridor within the site. The landscape masterplan for the operational phase of the site incorporates a wildlife corridor which will provide a commuting and foraging corridor for bats including treelines and shrubs with native species.	No significant residual impact
Bats – foraging and commuting	Local (higher)	Lighting disturbance Reduction of commuting and foraging habitat	Long-term, Minor impact		No significant residual impact
Breeding birds	Local (higher)	Noise and human activity disturbance	Negligible impact	N/A	No significant residual impact
Brent Goose	Local (higher)	Disturbance to flight lines	Negligible impact	N/A	No significant residual impact
Invertebrates	County	Reduction of habitat	Long-term, Moderate	The landscape masterplan for the operational phase of	No significant residual

			impact	the site incorporates native wildflower meadows within the site which will provide habitat for pollinating insects. Further, several of the native trees and scrub to be planted also provide nectar to pollinators.	impact
--	--	--	--------	--	--------

Table 5-18: Summary of operational impacts, mitigations and significance of residual impacts.

5.9 DO NOTHING SCENARIO

If the proposed works were not to go ahead and the present land management continues as is, the ecological value of the site would largely remain as it is. The naturalisation of the grassland has the potential to increase floral species diversity. The invasive non-native species on the site have the potential to outcompete the native flora in some areas of the site.

5.10 WORST CASE SCENARIO

No significant effects are anticipated on any of the ecological features. However, considering worst case scenario, failure to correctly incorporate the wildlife corridor and lighting design in a bat friendly manner could result in mammals, including bats, to become averse from using the site and could lead to fragmentation of suitable habitats in the vicinity of the site. Strict adherence to the mitigation measures incorporated into the landscape masterplan and lighting design will minimise this risk.

5.11 MONITORING AND REINSTATEMENT

Follow up bat surveys will be carried out 1-2 years post construction to evaluate implemented measures to provide commuting and foraging habitat along a dark corridor for bats. The monitoring should be carried out by a qualified Ecologist and take place in the summer months May – September in the form of activity surveys including transects and automatic static detectors.

5.12 DIFFICULTIES IN COMPILING INFORMATION

There were no difficulties in compiling this information.

5.13 REFERENCES

- Bird Watch Ireland (2022) *The Irish Wetland Bird Survey - summary tables*. Available at: <https://c0amf055.caspio.com/dp/f4db30005dbe20614b404564be88> (Accessed: 24 February 2022).
- Calaciura, B. and Spinelli, O. (2008) *Management of Natura 2000 habitats: 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrats (Festuco-Brometalia) (*important orchid sites)*. European Commission. Available at: http://ec.europa.eu/environment/nature/natura2000/management/habitats/pdf/6170_Alpine_calcareous_grasslands_summary.pdf (Accessed: 16 July 2021).
- CIEEM (2018) 'Guidelines For Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater, Coastal and Marine'. Chartered Institute of Ecology and Environmental Management.
- Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition)*. 3rd edn. The Bat Conservation Trust, London.

Crofts, A. and Jefferson, R.G. (1999) *The Lowland Grassland Management Handbook*. 2nd edn. English Nature/The Wildlife Trusts. Royal Society For Nature Conservation.

Department of Housing, Planning and Local Governments (2018) 'Guidelines for planning authorities and An Board Pleanála on carrying out environmental impact assessment'.

Dublin City Council (2008) Whitehall Framework Plan. Available at: https://www.dublincity.ie/sites/default/files/media/file-uploads/2018-05/Whitehall_Framework_Plan.pdf (Accessed: 22 March 2022)

Dublin City Council (2016a) 'Dublin City Biodiversity Action Plan 2015-2020'. Dublin City Council. Available at: <https://www.dublincity.ie/sites/default/files/content/RecreationandCulture/DublinCityParks/Biodiversity/Documents/DublinCityBiodiversityActionPlan2015-2020.pdf> (Accessed: 6 December 2019).

Dublin City Council (2016b) 'Dublin City Development Plan 2016-2022'. Available at: <http://www.dublincity.ie/sites/default/files/content/Planning/DublinCityDevelopmentPlan/Written%20Statement%20Volume%201.pdf> (Accessed: 19 June 2019).

Dublin City Council (2021) 'Draft Dublin City Biodiversity Action Plan (2021-2025)'. Available at: https://consultation.dublincity.ie/parks/draft-dublin-city-biodiversity-action-plan/supporting_documents/DCCDraftBiodiversityActionPlan_20212025_issued19.05.21.pdf (Accessed: 10 January 2021). EPA (2017) *Guidelines on the information to be contained in Environmental Impact Assessment Reports DRAFT*. DRAFT. Environmental Protection Agency. Available at: <http://www.epa.ie/pubs/advice/ea/EPA%20EIAR%20Guidelines.pdf> (Accessed: 24 August 2017).

EPA (2022) *EPA Maps, Next Generation EPA Maps*. Available at: <https://gis.epa.ie/EPAMaps/> (Accessed: 25 January 2022).

Fossitt, J.A. (2000) *A guide to habitats in Ireland*. Kilkenny: Heritage Council/Chomhairle Oidhreachta (Heritage Council of Ireland series).

ILP (2018) 'Guidance Note 08/18. Bats and Artificial Lighting in the UK - Bats and the Built Environment series.' Institution of Lighting Professionals, Bat Conservation Trust.

JBA (2022) *Residential Development Hartfield Place, Swords Road, Dublin - Appropriate Assessment Screening Report*. JBA Consulting Engineers and Scientists Ltd.

Kelleher, C. and Marnell, F. (2006) *Bat Mitigation Guidelines for Ireland*. National Parks and Wildlife Service / Department of Environment, Heritage and Local Government. Available at: <https://www.npws.ie/sites/default/files/publications/pdf/IWM25.pdf> (Accessed: 1 August 2021).

NBDC (2022) *Biodiversity Maps - Map Viewer, National Biodiversity Data Centre Biodiversity Maps*. Available at: <https://maps.biodiversityireland.ie/Map> (Accessed: 24 January 2022).

NPWS (2014) 'North Bull Island SPA (004006) Conservation objectives supporting document - Version 1'. National Parks and Wildlife Service / Department of Arts, Heritage and the Gaeltacht. Available at: [https://www.npws.ie/sites/default/files/publications/pdf/North%20Bull%20Island%20SPA%20\(004006\)%20Conservation%20objectives%20supporting%20document%20-%20\[Version%201\].pdf](https://www.npws.ie/sites/default/files/publications/pdf/North%20Bull%20Island%20SPA%20(004006)%20Conservation%20objectives%20supporting%20document%20-%20[Version%201].pdf) (Accessed: 19 June 2019).

NPWS (2019a) *The status of EU protected habitats and species in Ireland. Volume 1: Summary Overview*. Unpublished NPWS Report. National Parks and Wildlife Service / Department of Culture, Heritage and the Gaeltacht. Available at: https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol1_Summary_Article17.pdf (Accessed: 30 September 2019).

NPWS (2019b) *The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments*. Edited by: Dierdre Lynn and Fionnuala O'Neill. Available at: https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol2_Habitats_Article17.pdf (Accessed: 31 October 2019).

NPWS (2019c) *The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments*. Edited by: Dierdre Lynn and Fionnuala O'Neill. Available at: https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol3_Species_Article17.pdf (Accessed: 31 October 2019).

NPWS (2021) *Habitat and Species data, National Parks & Wildlife Service*. Available at: <https://www.npws.ie/maps-and-data/habitat-and-species-data> (Accessed: 5 July 2021).

NRA (2008) *Environmental Impact Assessment of National Road Schemes- A Practical Guide*. National Roads Authority. Available at: https://www.google.ie/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjF_IO8q8bZAhWBjCAKHdI_pDyMQFggpMAA&url=http%3A%2F%2Fwww.tii.ie%2Ftechnical-services%2Fenvironment%2Fplanning%2FEnvironmental-Impact-Assessment-of-National-Road-Schemes-Practical-Guide.pdf&usq=AOvVaw07sfytJ4CpCrkBjKUS1TAe (Accessed: 27 February 2018).

NRA (2009a) *National Roads Authority Guidelines for Assessment of Ecological Impacts of National Road Schemes*. Transport Infrastructure Ireland. Available at: <http://www.tii.ie/technical-services/environment/planning/Guidelines-for-Assessment-of-Ecological-Impacts-of-National-Road-Schemes.pdf> (Accessed: 10 April 2017).

NRA (2009b) *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*. National Roads Authority. Available at: <http://www.tii.ie/technical-services/environment/planning/Ecological-Surveying-Techniques-for-Protected-Flora-and-Fauna-during-the-Planning-of-National-Road-Schemes.pdf> (Accessed: 29 November 2017).

NRA (2010) 'Guidelines on The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads'. National Roads Authority. Available at: <http://www.tii.ie/technical-services/environment/construction/Management-of-Noxious-Weeds-and-Non-Native-Invasive-Plant-Species-on-National-Road-Schemes.pdf>.

OSI (2021) *GeoHive, GeoHive*. Available at: <http://map.geohive.ie/mapviewer.html> (Accessed: 1 November 2021).

Pearson, S. *et al.* (2006) *Gestione di prati e pascoli secchi*. Ufficio federale dell'ambiente (UFAM), Berna; AGRIDEA, Lindau, Confederazione Svizzera.

Scottish Natural Heritage (2017) 'Recommended bird survey methods to inform impact assessment of onshore wind farms'.

Smith, G.F. *et al.* (2011) 'Best practice guidance for habitat survey and mapping', *The Heritage Council: Ireland* [Preprint].

Wray, S. *et al.* (2010) 'Valuing Bats in Ecological Impact Assessment', *In Practice*, Dec 2010(70), pp. 23–25.

6 LAND, SOIL & GEOLOGY

6.1 INTRODUCTION

This chapter of the EIAR was undertaken PUNCH Consulting Engineers to assess the impact of the proposed Swords Road development on the surrounding soils, geology and groundwater environment.

The potential impacts and mitigation measures the construction and post development activities may have on soils, geology and groundwater are set out in the following sections. In summary, there are no likely significant impacts predicted on the soils, geology and groundwater environment associated with the proposed development of the site.

6.2 METHODOLOGY

The assessment of the potential impact of the activity on water and hydrology was carried out according to the methodology specified in the following guidance documents:

- 1) Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Statements (2017);

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

- 1) Geological heritage sites in the vicinity of the perimeter of the subject site;
- 2) Landfills, industrial sites in the vicinity of the site and the potential risk of encountering contaminated ground;
- 3) The quality, drainage characteristics and range of agricultural uses of soil around the subject site;
- 4) Quarries or mines in the vicinity, the potential implications (if any) for existing activities and extractable reserves;
- 5) The extent of topsoil and subsoil cover and the potential use of this material on site or requirement to remove it off-site as waste for disposal or recovery;
- 6) High yielding water supply springs/ wells in the vicinity of the subject site to within a 2 km radius and the potential for increased risk presented by the proposed development;
- 7) Classification (regionally important, locally important) and extent of aquifers underlying the study area perimeter and increased risks presented to them by construction and operation related activities associated with aspects such as for example removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes, change in groundwater quality;
- 8) Natural hydrogeological/ karst features in the area and potential for increased risk presented by the activities at the proposed development site; and
- 9) Groundwater-fed ecosystems and the increased risk presented by the construction and operational phases of the proposed development both spatially and temporally.

The following sources of information were consulted to establish the baseline environment:

- 1) The Geological Survey of Ireland (GSI) online well card and groundwater records for the area were inspected, with reference to hydrology and hydrogeology;
- 2) EPA water quality monitoring data in the area;
- 3) EPA Geoportal website;
- 4) Dublin Port Tunnel Design and Construct Contract Site Investigation Data Reports, Volume 5 Part 1 Site Investigation Data Reports, dated October 2000;
- 5) Report on Site Investigation at Swords Road Whitehall Dublin 9, Ground Investigations Ireland (Report No 2442-02-10), dated May 2010;
- 6) Swords Road Ground Investigation, Ground Investigations Ireland (Report No. 25-08-20 Rev A), dated August 2020;
- 7) Tunnel Impact Assessment - Hartfield Place Residential Development Swords Road, AGL Consulting, dated February 2022.

From the GSI /EPA website, the following information was obtained:

- 1) Soil Map;
- 2) Bedrock Geology Maps;
- 3) Quaternary (Subsoils) Maps;
- 4) Well Card Database (Groundwater Wells);
- 5) Historical Geological 6 inch:1-mile maps;
- 6) Database of Site Investigations/Surveys;
- 7) Waste sites, mine sites and industrial locations;
- 8) Geological heritage locations; and
- 9) Water features.

6.3 RECEIVING ENVIRONMENT

The following site investigation information is available for this site:

1. Dublin Port Tunnel Design and Construct Contract Site Investigation Data Reports, Volume 5 Part 1 Site Investigation Data Reports, October 2000. The relevant site investigation information includes the following:
 - 7 No. boreholes, 3 No. of which were extended using open hole drilling
 - 4 No rotary coreholes
 - 4 No. Standpipes installed in the boreholes/coreholes

The 100 series site investigation points were carried by IGSL in 1995 and the 200 series site investigation points were carried by Geotech Specialists in 1996.
2. Report on Site Investigation at Swords Road Whitehall Dublin 9, Ground Investigations Ireland, dated May 2010, Report No 2442-02-10. The relevant site investigation information includes the following:
 - 4 No. Rotary coreholes
3. Swords Road Ground Investigation, Ground Investigations Ireland, dated August 2020 report No. 25-08-20 Rev A. The relevant site investigation information includes the following:
 - 10 No. boreholes (BH01 to BH10)
 - 3 No. Geobore-S coreholes (BH04, BH05, BH09)
 - 10 No. Trial Pits (TP01 to TP10)
 - 3 No. Standpipes (BH01, BH06, BH10)

Based on the available information, the ground conditions comprise the following:

- Approx. 1m to 3m of Made Ground or a firm/firm to stiff (locally soft to firm) Sandy gravelly CLAY (Upper Brown Boulder Clay).
- A very stiff to hard Upper Black, Lower Black and Lower Brown Boulder Clay under lies these materials at a depth of between 0.3m and 3mbgl (39.1m and 37.0mOD). The stratum is between 17.7m and > 27.2m thick.
- The Upper Black, Lower Black and Lower Brown Boulder Clays are typically described as sandy gravelly CLAY.
- There are occasional lenses of Sands and Gravel within these strata with varying thicknesses ranging from 0.2 to 3m.
- A weathered rock zone sometimes lies below the Boulder Clay at a depth of between 18.6m and 25.5mbgl (14.6m and 20.8mOD). The weathered rock is described as weak to medium strong dark grey decomposed Limestone or a Fractured Limestone.
- The depth to top of rock within the site varies. There was no rock encountered within the site investigation points up to Ch. 2+370 where the max penetration depth of the rotary coreholes was 30mbgl (10.85m to 10.73mOD).
- Rock is encountered towards the southern part of the site from the site investigation points from Ch. 2+430 onwards. The rock is encountered at a depth of between 18m and 28.6mbgl (21.4m and 111.5mO). However, the top of rock is variable and appears to drop in RC2 at Ch. 2+485 where competent rock is not encountered to a depth of 31mbgl (8.5mOD).
- The rock is described as a strong to very strong fresh to slightly weathered dark grey LIMESTONE with interbedded layers of calcareous mudstone or a light grey Calcisiltite with frequent thin beds of black argillaceous shale.

The proposed site is located within Dublin groundwater body (IE_EA_G_008) where the bedrock is limestone and the sub-soil is made up of till (EPA 2021). The aquifer vulnerability of the site is low and the Bedrock is Moderately Productive only in local zones.

Geology

The GSI quaternary maps for the region indicate that the soil type for the region is till derived from limestone. Refer to Figure 6-1 below.



Figure 6-1 Quaternary Sediments (www.gsi.ie)

The GSI bedrock map shows that the underlying bedrock for the site consists of 'Dark limestone & shale', as shown in Figure 6-2. The formation comprises dark-grey to black, fine-grained, occasionally cherty, micritic limestones that weather paler, usually to pale grey. There are rare dark coarser grained calcarenitic limestones, sometimes graded, and interbedded dark-grey calcar.

The lands are not located in a GSI or Environmental Protection Agency (EPA) source protection area.



Figure 6-2 GSI Bedrock Map (www.gsi.ie)

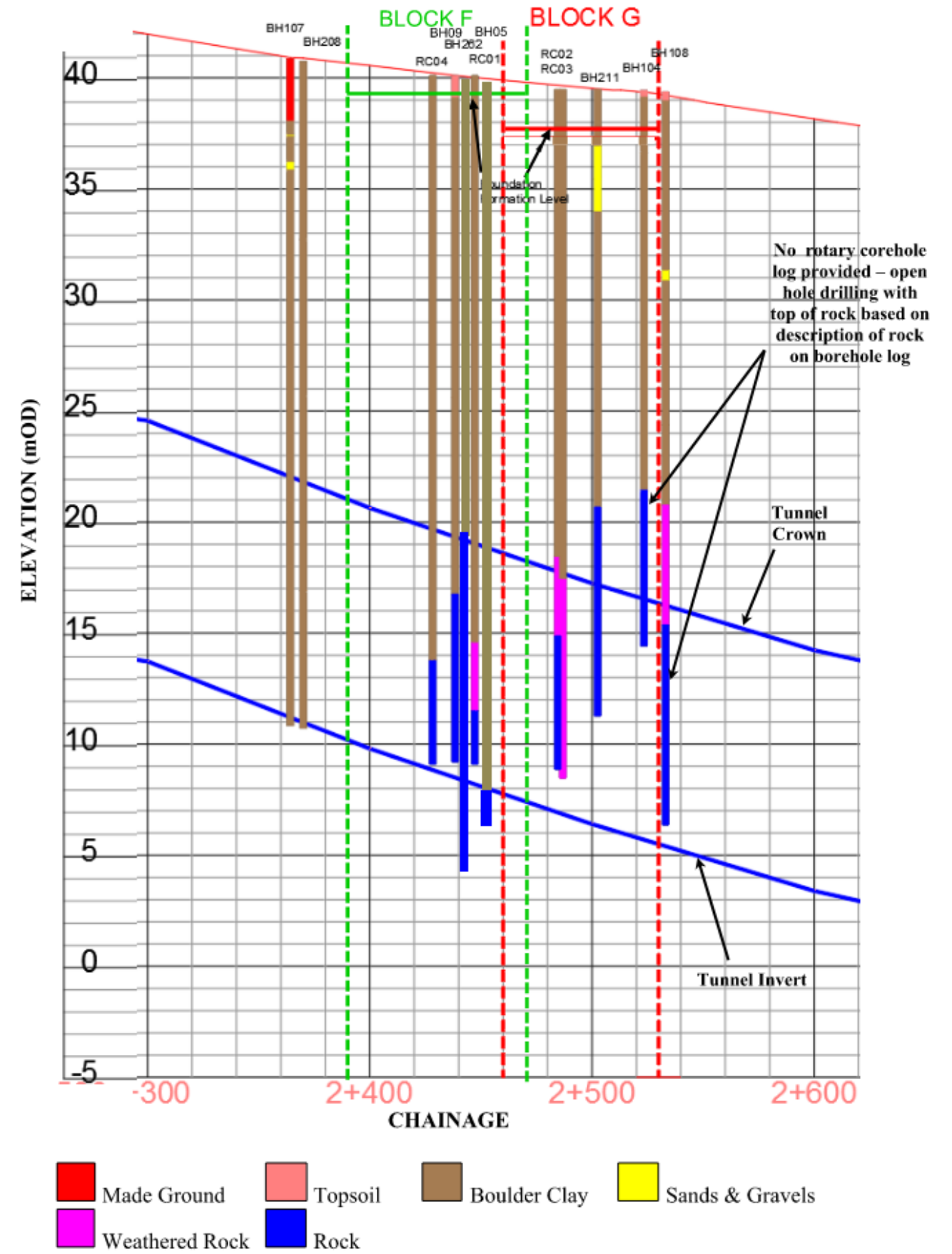


Figure 6-3 Subsurface ground profile along northbound tunnel within site from AGL Consulting Geotechnical Engineer's Tunnel Impact Assessment

EPA data shows there are no watercourses within the Swords Road site, however the River Tolka is located approximately 1.5km to the south of the site.

GSI data show that the Swords Road site is within an area of low groundwater vulnerability, as shown in Figure 6-4. This indicates that the area has low likelihood of groundwater contamination. In addition, the proposed development, which is wholly residential in nature, does not represent a significant potential to contaminate water within the area.

For details of surface water contamination mitigation measures during the construction and operation phases, please refer to Chapter 7 of this EIAR.



Figure 6-4: National Vulnerability Map (www.gsi.ie)

6.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will consist of the construction of 7 no. blocks in heights up to 8 storeys (over single level basement) comprising 472 no. apartment units, a creche, café unit, and internal residential amenity space. The proposal also includes car, cycle, and motorcycle parking, public and communal open spaces, landscaping, bin stores, plant areas, substations, switch rooms, and all associated site development works and services provision. Access is provided from the development from Swords Road with associated upgrades to the existing public road and footpaths. A full description of the development is provided in the statutory notices and in Chapter 3 of the EIAR submitted with the application.

The proposed development in relation to soils and geology will comprise:

- Removal of existing topsoil and subsoil

- Construction of basement including associated piling and bulk excavations
- Reprofilling and importing fill to build levels on site
- The construction of multi storey residential buildings, creche, resident support facilities and associated foundations
- Construction of vehicular connection via Swords Road and additional pedestrian/cyclist accesses
- Excavation for installation of services, in-ground tanks, pavements and landscaping on existing and imported fill

6.5 POTENTIAL IMPACTS

There is potential for land and soils to interact with other environmental elements during the **Construction** and **Operational Phases** of the project. These interactions are listed below.

Construction Phase

Traffic and Transportation

Construction traffic will have an impact on the land and soils as well as on the traffic on the local road network. There is no anticipated cumulative effect as the construction stage is finite.

Water and Hydrology

Any environmentally damaging fluids will have an effect on the surrounding hydrological network. This is discussed further in the hydrology section. There is no anticipated cumulative effect as the construction stage is finite.

Waste Management (incl. Accidental Spills and Leaks)

There will be an interaction with waste management for the construction stage.

Noise and Vibration

The earthworks on site will require construction vehicles which have an impact on the land and soils as well as on the noise on the local environment. There is no anticipated cumulative effect as the construction stage is finite.

Air Quality

The earthworks and construction work on site have potential to have an impact on the land and soils as well as on the air quality on the local environment. There is no anticipated cumulative effect as the construction stage is finite.

Flora and Fauna

The earthworks and construction work on site have potential to have an impact on the land and soils as well as on the flora and fauna within the local environment.

Accidental Spills and Leaks

During construction of the development, there is a potential risk from accidental pollution incidences from the following sources: spillage or leakage of oils and fuels stored on site; spillage or leakage of oils and fuels from construction machinery or site vehicles; spillage of oil or fuel from refuelling machinery on site; and the use of concrete and cement during appropriate foundation construction.

Accidental spillages may result in contamination of soils and groundwater underlying the site should contaminants migrate through the subsoils and impact underlying groundwater. Soil stripping and excavation for drainage lines will also reduce the thickness of subsoils in localised areas.

Concrete (specifically, the cement component) is highly alkaline and any spillage which migrates through the subsoil would be detrimental to groundwater quality.

Geological Environment

There are no likely significant impacts on the geological environment associated with the proposed development of the site.

Operational Phase

Accidental Spills

During the operational phase of the development, there is a potential risk from accidental pollution incidences from spillage or leakage of oils and fuels from maintenance, emergency or private vehicles.

Traffic and Transportation

This is directly linked to the accidental spills associated with vehicle usage during the operational phase of the development.

Water and Hydrology

If the material assets are not constructed appropriately, then there is a risk of pipe leakage at the operational phase.

Waste Management

There is potential for runoff from the waste storage areas to contaminate the local surface water network.

6.6 POTENTIAL CUMULATIVE IMPACTS

There are no anticipated cumulative impacts.

6.7 MITIGATION MEASURES

Construction Phase

Stripping Topsoil

Full topsoil removal will be required to implement the required works. Topsoil that can be reused for landscaping works will be stockpiled on site. The remaining topsoil will be removed from site.

Excavation of Subsoil Layers

Minor subsoil removal will be required where works require excavation to install foundations and services and other works. The impact of this is expected to be minimal.

Construction Traffic

Construction traffic will be in operation during the proposed works. This will comprise construction workers, temporary special construction vehicles, cranes, and excavation machinery. Their impact on the land and soil is expected to be limited to their operations related to the construction works, and therefore is expected to be short term in nature. Construction traffic management is outlined in the Construction Management Plan (CMP) included in the planning application. A Construction Traffic Management Plan (CTMP) will be developed by the contractor prior to the commencement of work on site and will be prepared in consultation with DCC. Construction debris particularly site clearance, spoil removal and dirty water run off can have a significant impact on footpaths and roads adjoining a construction site, if not adequately dealt with and these matters will require to be fully addressed in the contractors CTMP.

Below is a list of the proposed traffic management measures to be adopted during the construction works. Please note that this is not an exhaustive list, and that it will be the appointed contractor's responsibility to prepare a detailed CTMP.

- Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access locations
- Construction and delivery vehicles will be instructed to use only the approved and agreed means of access; and movement of construction vehicles will be restricted to these designated routes.
- Consideration will be given to reduce the volume of construction traffic accessing the site through reduce – reuse and recycle methods. Delivery control will also be adopted to reduce potential heavy vehicle convoys.
- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material.
- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the site;
- Parking of site vehicles will be managed and will not be permitted on the public road, unless proposed within a designated area that is subject to traffic management measures and agreed with DCC.
- A road sweeper will be employed to clean the public roads adjacent to the site of any residual debris that may be deposited on the public roads leading away from the construction works.
- On site wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the site, to remove any potential debris on the local roads.
- All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol, or diesel. Spill kits will be available on site. All scheduled maintenance carried out off-site will not be carried out on the public highway; and
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users including mobility impaired persons.

In order to provide fuel to the relevant items of plant on site, a certified double skinned metal fuel tank with integrated pump, delivery hose, meter, filter and locking mechanism will be situated in a secure area on the construction site. It will be situated within a bund. This tank will be certified for lifting when full. Sand piles and emergency clean up spill kits will be readily available in the event of a fuel spill. A hazardous bin will also be available to contain any spent sand or soak pads. New metal gerry cans with proper pouring nozzles will be used to move fuel around the site for the purposes of refuelling items of small plant on site. Drip trays will be used under items of small plant at all times. Any waste oils etc. contained in the drip trays or the bunded area will be emptied into a waste oil drum, which will be stored within the bund. Metal gerry cans and any other items of fuel containers will be stored in certified metal bunded cabinets. Any gas bottles will be stored in a caged area at a secure location on the site. All will be properly secured at point of work to mitigate accidental spills and leaks.

Waste Management

Waste should be stored on site in a designated area and removed from site regularly. Contaminated materials are to be bunded prior to removal from site so as not to have damaging effects on the soils and geology underneath.

Noise and Vibration

The mitigation measures for construction phase noise and vibration are outlined in Chapter 8. The measures relevant to land, soil and geology is the application/implementation of Best Practicable Means (BPM) from BS 5228 during construction including:

- Unnecessary revving of engines will be avoided and equipment will be switched off when not in use;
- Internal haul routes will be kept well maintained;
- Rubber linings in, for example, chutes and dumpers will be used to reduce impact noise;
- Drop heights of materials will be minimised;
- Plant and vehicles will be sequentially started up rather than all together;

- Plant will always be used in accordance with manufacturers' instructions. Care will be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading will also be carried out away from such areas; and
- Regular and effective maintenance by trained personnel will be undertaken to keep plant and equipment working to manufacturer's specifications.

The effectiveness of the application of mitigation measures is dependent on the construction methodology and the appointed construction contractor.

Operational Phase

Accidental Spills and Leaks

At operational phase, impacts on land and soils from the development will be limited to risk of fuel or oil leaks from vehicles using the road network or the carparks. The risk posed by such instances will be mitigated with the surface water treatment measures outlined in detail in the Engineering Planning Report and drainage drawings submitted as part of this planning application. Joseph O'Reilly Consulting Civil & Structural Engineers have proposed a number of SUDS measures within the scheme including:

- i. Green Roofs
- ii. Podium Green Areas over carpark
- iii. Landscaped Areas/green gardens
- iv. Permeable Paving parking spaces & footpaths
- v. Filter drains/Infiltration strips alongside impermeable surfaces where applicable
- vi. Underground attenuated storage systems
- vii. Hydrobrake Flow Control
- viii. Petrol Interceptor

These SuDS measures reduce the proposed developments reliance on attenuation tanks to reduce peak run-off flow rates and also treat stormwater to improve quality through a treatment stream prior to discharge to the wider network and environment. Treatment of surface water through these SuDS measures (e.g. permeable paving) and petrol interceptors prior to discharge from the site will mitigate any potentially harmful impacts.

Integrity of Material Assets

The material assets (surface water, foul water and watermain networks) will be pressure tested to relevant Dublin City Council and Irish Water standards prior to completion of the works. The drainage networks will also be CCTV surveyed and reviewed to ensure there are no defects. These test measures will ensure to a reasonable degree that the pipes have been installed to the required standard and the risk of leakage will be greatly reduced.

Traffic and Transportation

The permanent design for the site – consisting of sealed roads and basement structure - will protect the existing soil and geological environment during operation.

Water and Hydrology

The material assets are to be constructed in strict accordance with the relevant building standards and to the requirements of the relevant statutory authority's code of practise to mitigate the risk of pipe leakage at the operational phase.

Waste Management

During the operational stage, runoff from waste storage areas will be collected by gullies and discharged to the foul drainage system on site. This drainage shall not be allowed drain to ground or to the surface water network.

6.8 PREDICTED IMPACTS

Construction Phase

The predicted impact on land, soil and geology at construction phase is limited to the excavations required to construct the foundations and install the proposed works. If mitigation elements are implemented, then the risk of impact is negligible.

Operational Phase

As long as relevant impact mitigation measures are implemented, the impact from the operational phase would be negligible on the surrounding soils, geology and groundwater environment.

6.9 'DO NOTHING' SCENARIO

Under a 'Do Nothing' scenario, there would be no change in the site's current use, and there would no change to the impacts to the soil and geological environment over the existing scenario.

6.10 WORST CASE SCENARIO

No significant effects on land, soils, subsoils or bedrock are anticipated. However, any contamination instances during construction will likely occur in localised areas only, with effects likely to be minimal – especially once the mitigation measures outlined above are actioned appropriately during construction and operation phases.

6.11 MONITORING & REINSTATEMENT

Construction stage elements should be monitored by the contractor for compliance with all relevant standards.

The operational phase of the proposed development should be monitored by the management company(s) for the site.

Any environmental impact should be rectified as soon as is practical.

6.12 DIFFICULTIES IN COMPILING INFORMATION

No particular difficulties were encountered in completing this section.

6.13 REFERENCES

1. Dublin Port Tunnel Design and Construct Contract Site Investigation Data Reports, Volume 5 Part 1 Site Investigation Data Reports, dated October 2000
2. Report on Site Investigation at Swords Road Whitehall Dublin 9, Ground Investigations Ireland (Report No 2442-02-10), dated May 2010
3. Swords Road Ground Investigation, Ground Investigations Ireland (Report No. 25-08-20 Rev A), dated August 2020
4. Hydrocare Environmental Ltd (2022) Site Specific Flood Risk Assessment Report (submitted with this planning application)
5. Joseph O'Reilly Consulting Civil & Structural Engineers (2022) Engineering Services Report (submitted with this planning application)
6. GSI On Line Mapping
7. EPA On Line Mapping
8. Tunnel Impact Assessment - Hartfield Place Residential Development Swords Road, AGL Consulting, dated February 2022.

7 HYDROLOGY AND WATER SERVICES

7.1 INTRODUCTION

This chapter of the EIAR was undertaken by PUNCH Consulting Engineers to assess the likely impact of the proposed development on the drainage and water supply material assets, as well as identifying proposed mitigation measures to minimise any impacts. Impact on the flood regime effected by the proposed development is also addressed in this chapter.

7.2 METHODOLOGY

The assessment of the potential impact of the activity on water and hydrology was carried out according to the methodology specified in the following guidance documents:

- 1) Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Statements (2017);
- 2) EPA Advice Notes on Current Practice (in the Preparation of EIS) (2003)

The following sources of information were consulted to establish the baseline environment: -

- 1) The Planning System and Flood Risk Management – Guidelines for Planning Authorities - Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW);
- 2) The Geological Survey of Ireland (GSI) well card and groundwater records for the area were inspected, with reference to hydrology;
- 3) Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (CIRIA 532, 2001);
- 4) Base maps – Ordnance Survey of Ireland;
- 5) Flood Hazard Maps and flooding information for Ireland, www.floodmaps.ie - Office of Public Works (OPW);
- 6) CFRAM/ PFRA Maps (OPW);
- 7) Geological Survey of Ireland (GSI) maps on superficial deposits;
- 8) Dublin Port Tunnel Design and Construct Contract Site Investigation Data Reports, Volume 5 Part 1 Site Investigation Data Reports, dated October 2000;
- 9) Report on Site Investigation at Swords Road Whitehall Dublin 9, Ground Investigations Ireland (Report No 2442-02-10), dated May 2010;
- 10) Swords Road Ground Investigation, Ground Investigations Ireland (Report No. 25-08-20 Rev A), dated August 2020.

7.3 RECEIVING ENVIRONMENT

The receiving environment comprises the existing services within the vicinity of the development. There is 1 no. remote water course (River Tolka) located approx. 1.5km to the south of the development site.

The following drainage and water supply services are present within and adjacent to the site:

1. Foul water:
 - a. A 300mm vitrified clay foul water sewer on Swords Road to the west of the site.
 - b. A 300mm concrete foul water sewer on Collins Avenue to the north of the site.
 - c. A 225mm concrete foul water sewer on High Park to the east of the site.

2. Surface Water:
 - a. A 300mm concrete surface water sewer on Swords Road to the west of the site.
 - b. A 300mm concrete surface water sewer on Collins Avenue to the north of the site.
 - c. A 300mm concrete surface water sewer (increasing to 600mm dia.) on High Park to the east of the site.
3. Potable/Mains Water:
 - a. A 12" Asbestos watermain on Swords Road to the west of the site.
 - b. A 300mm ductile iron watermain on Collins Avenue to the north of the site.
 - c. A 100mm uPVC watermain on High Park to the east of the site.

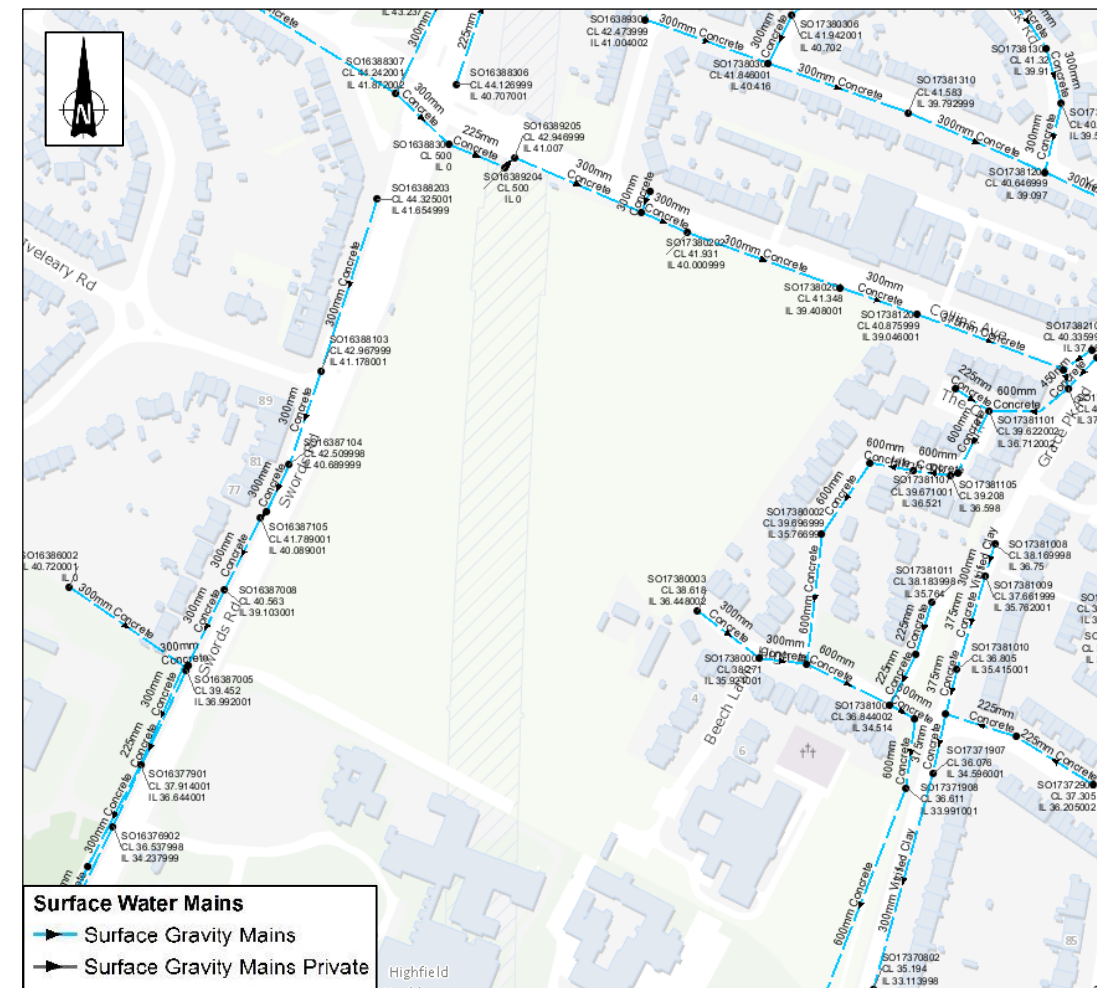


Figure 7-1: Existing Surface Water Drainage in the Vicinity of the Swords Road site (Irish Water Records)

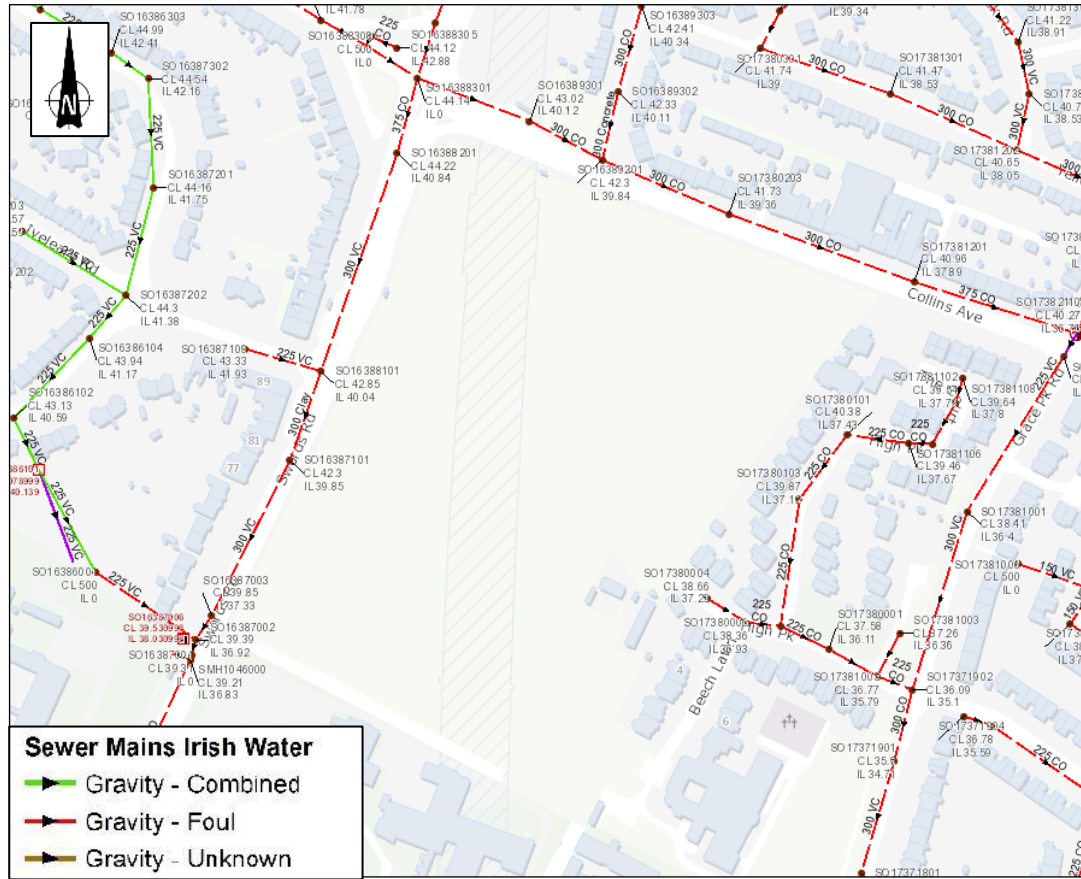


Figure 7-2: Existing Foul Drainage in the Vicinity of the Swords Road site (Irish Water Records)

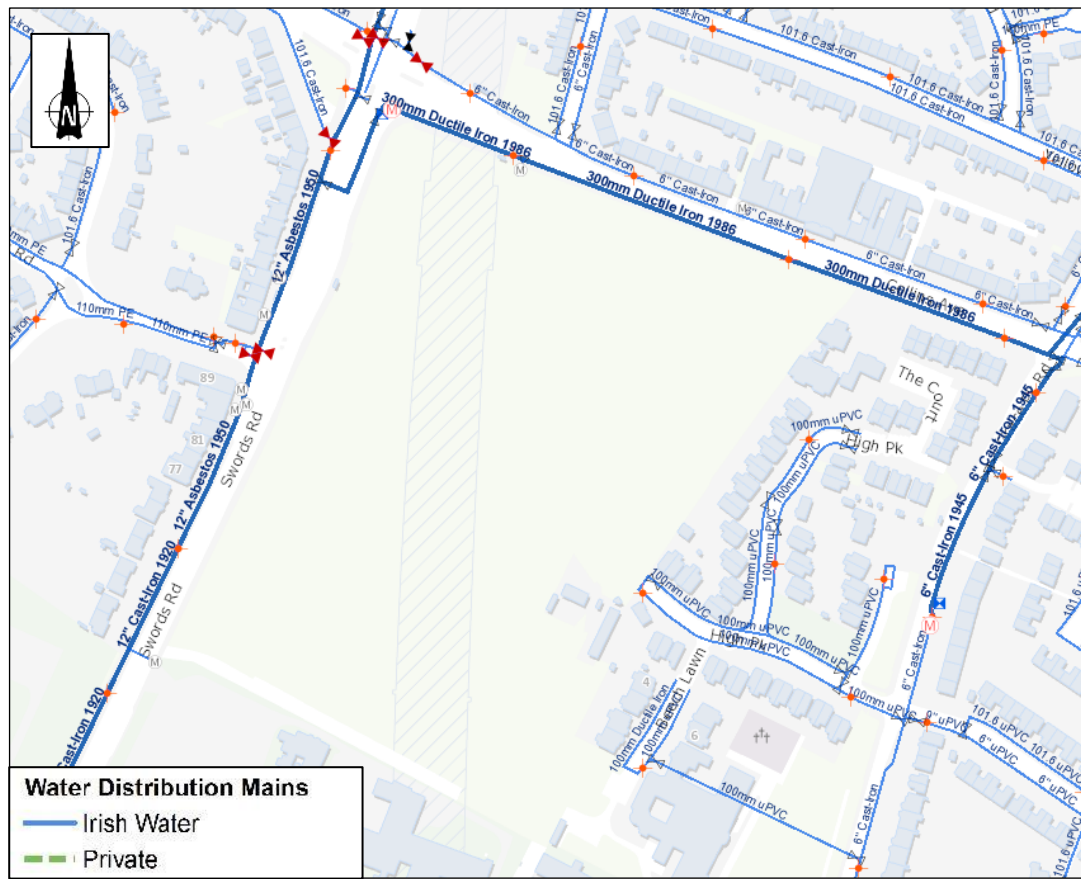


Figure 7-3: Existing Water Mains in the Vicinity of the Swords Road site (Irish Water Records)

The following water course is present adjacent to the site:

- 1) River Tolka
 - a. The EPA Envision Mapping Portal notes that there are no watercourses local to this development site. The nearest fluvial source to the proposed development site is the River Tolka located ca. 1.5km to the south, and is therefore not considered to be a source of fluvial flooding to the proposed development site.
 - b. As per CFRAMS flood mapping for the site, the site of the proposed development is shown as being located in the fluvial Flood Zone C and that there is no fluvial flood risk to the site of the proposed development. See the Site-Specific Flood Risk Assessment Report that accompanies this planning application for further details.

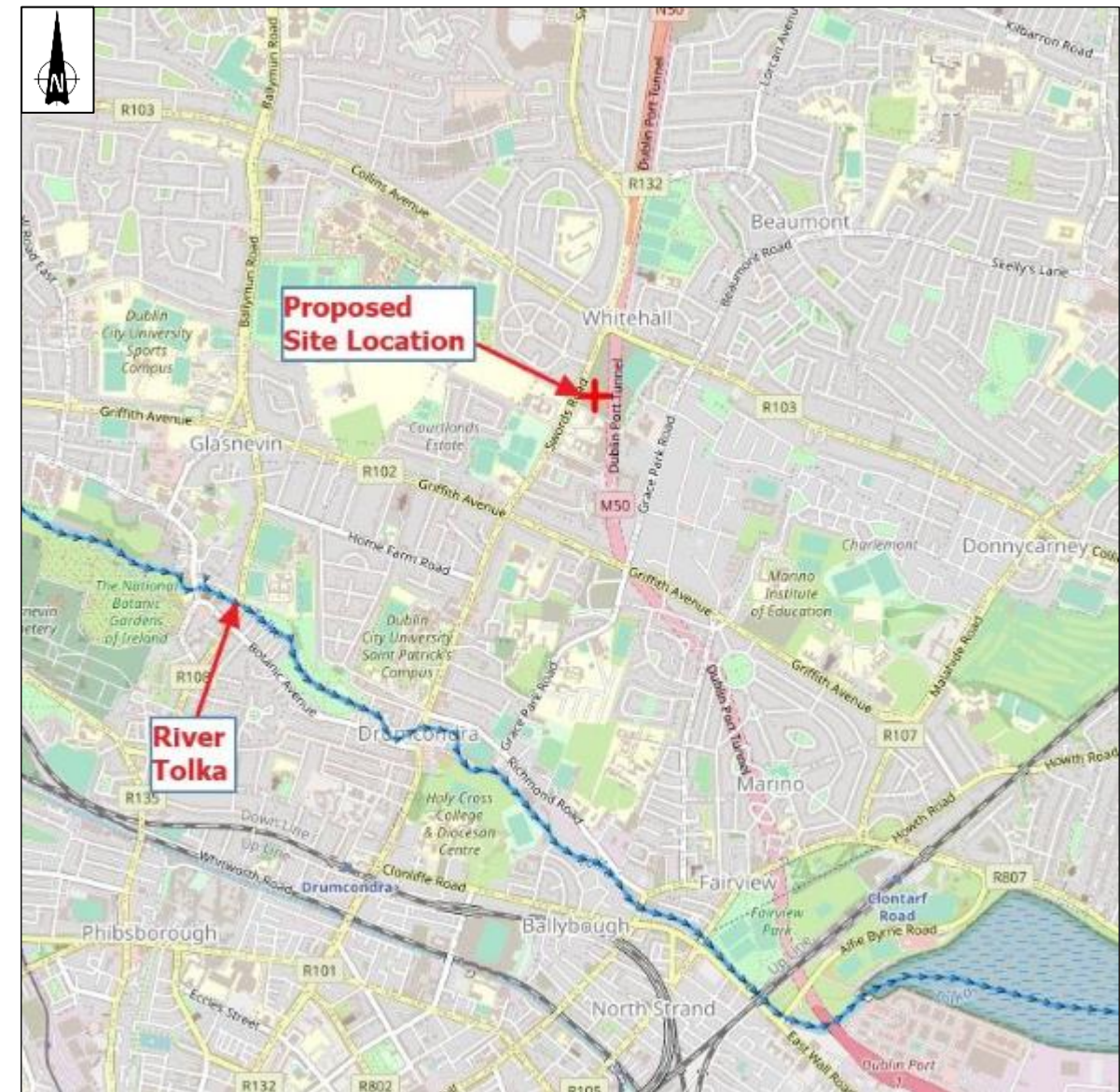


Figure 7-4 Location of adjacent watercourse - River Tolka (EPA maps)

7.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will consist of the construction of 7 no. blocks in heights up to 8 storeys (over single level basement) comprising 472 no. apartment units, a creche, café unit, and internal residential amenity space. The proposal also includes car, cycle, and motorcycle parking, public and communal open spaces, landscaping, bin stores, plant areas, substations, switch rooms, and all associated site development works and services provision. Access is provided from the development from Swords Road with associated upgrades to the existing public road and footpaths. A full description of the development is provided in the statutory notices and in Chapter 3 of the EIAR submitted with the application.

The following connections to existing public drainage and water supply services works are proposed:

- 1) Foul Water:
 - a) It is proposed to discharge foul flows to the existing 225mm dia. foul sewer at the northeast of the site in High Park.
- 2) Surface Water:
 - a) A new surface water sewer network shall be provided for the proposed development which will be entirely separated from the foul water sewer network.
 - b) The surface water management strategy for the site is to discharge attenuated surface water runoff from the site to the existing public surface water network via separate connections to the west and east of the site.
 - c) The currently approved surface water system is the same to the previously approved system (DCC Reg. Ref.3269/10) in that it will consist of two separate networks with two different outfalls, containing surface water drainage, slung drainage, basement drainage, SUDS features and an underground attenuation system. The main difference is that the attenuation tanks will be concrete tanks and not stormbloc cells. The surface water network will connect to a new manhole which will be installed on the existing 300mm dia. storm main in the Swords Road. The surface water outfall to Swords Road will have a discharge rate of 1.6l/s which is the same as the extant planning. The outfall discharging into the existing surface water main in High Park will connect into an existing manhole and will have a discharge rate of 4.0l/sec. The network has been designed to cater for the 1:100 year storm with 20% climate change.
 - d) Joseph O'Reilly Consulting Civil & Structural Engineers have proposed a number of SUDS measures within the scheme including:
 - i. Green Roofs
 - ii. Podium Green Roof
 - iii. Roof Bioretention Areas
 - iv. Infiltration Trenches
 - v. Permeable Paving (tanked system)
 - vi. Permeable Paving (outside basement footprint)
 - vii. Bio-retention Tree Pits
 - viii. Underground attenuated storage systems
 - ix. Hydrobrake Flow Control
 - x. Petrol InterceptorThese SuDS measures reduce the proposed developments reliance on attenuation tanks to reduce peak run-off flow rates
- 3) Potable Water:
 - a) Irish Water provided confirmation that the site is to be supplied water by a connection made to the existing 300mm ductile iron watermain located in Collins Ave, at the junction with

- b) Swords Road. This will involve installing approximately 180m of 200mm internal diameter watermain from Collins Avenue to the proposed developments site boundary on Swords Road.
- b) The proposed watermain layout involves the installation of a 200mm internal watermain from the connection point at the site boundary to a plant room located in the proposed basement underneath Block A.
- c) Each proposed apartment block will have its own individual supply from the proposed plant room. A proposed fire water ring main is to be installed around the site to supply proposed fire hydrants.
- d) Sluice valves, air valves, scour valves and hydrants will be provided to meet the requirements of Irish Water and the Building Regulations.

7.5 POTENTIAL IMPACTS

Construction Phase

During the construction phase of the proposed development there are several potential processes that could impact the existing surface water, foul water and watermain networks:

- 1) Topsoil stripping and cut/fill earthworks activities may cause an elevated silt load
- 2) Hydrocarbons may be released into networks from accidental spills
- 3) The construction of the proposed in ground services will require the excavation, removal and reinstatement of existing natural and man-made ground.
- 4) There is potential for existing infrastructure to conflict with proposed excavation, by existing infrastructure being close to the proposed works.
- 5) The connection of watermain on site will require the public water network to be suspended for a period to allow connection into the existing network.

Operational Phase

If the material assets are not constructed appropriately, then there is a risk of pipe leakage.

7.6 POTENTIAL CUMULATIVE IMPACTS

Hydrology and Material Assets – Site Services, Drainage and Water Supply

The Material Assets – Site Services, Drainage and Water Supply requirement of the development is in part prescribed by the hydrological requirement for the development.

The proposed surface water network for the development has been designed to cater for the 1% AEP (1:100-year storm return period) storm, with 20% additional rainfall to allow for climate change. The surface water outfall to Swords Road will have a discharge rate of 1.6l/s. The surface water outfall to the existing surface water main in High Park will have a discharge rate of 4.0l/s.

The stormwater from the site will be treated and attenuated via the SuDS measures outlined in the Engineering Services Report and drainage drawings.

Similarly, interaction between hydrology and the proposed foul or potable water supply is not applicable or controlled as outlined in the sections above. As such, there is no anticipated cumulative effect.

Material Assets – Site Services, Communications, Electrical and Gas, and Material Assets – Site Services, Drainage and Water Supply

Drainage and water supply material assets should be co-ordinated with communications, electrical and gas material assets to ensure that there are no physical conflicts and that all necessary clearances are provided. As such, there is no anticipated cumulative effect.

7.7 MITIGATION MEASURES

Construction Phase

Throughout the construction works, all surface water (water from excavations etc.) will be pumped to a holding and settlement tank on site for treatment. The discharge water from the final tank will be routed to the existing surface water system with approval from the local authority. Visual checks of the settlement system will be carried out on a routine basis. Please refer to the Resource and Waste Management Plan by AWN Consulting for further information including the use of silt and petrochemical interception 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.

In order to provide fuel to the relevant items of plant on site, a certified double skinned metal fuel tank with integrated pump, delivery hose, meter, filter and locking mechanism will be situated in a secure area on the construction site. It will be situated within a bund. This tank will be certified for lifting when full. Sand piles and emergency clean up spill kits will be readily available in the event of a fuel spill. A hazardous bin will also be available to contain any spent sand or soak pads. New metal gerry cans with proper pouring nozzles will be used to move fuel around the site for the purposes of refuelling items of small plant on site. Drip trays will be used under items of small plant at all times. Any waste oils etc. contained in the drip trays or the bunded area will be emptied into a waste oil drum, which will be stored within the bund. Metal gerry cans and any other items of fuel containers will be stored in certified metal bunded cabinets. Any gas bottles will be stored in a caged area at a secure location on the site. All will be properly secured at point of work.

Surveys will be undertaken to ascertain the exact location of all infrastructure. The material assets are to be constructed in accordance with all relevant Dublin City Council and Irish Water standards.

These measures will be addressed within the Contractors method statements for the works. The contractor is to conduct the works in accordance with all relevant local authority requirements, and health and safety legislation.

Operational Phase

SuDS measures will intercept and attenuate surface water on site. The surface water will be passed through petrol interceptors and other SuDS measures that will clean the surface water. The water will be discharged to the surface water drainage system at a rate of 1.6l/s to Swords Road and at a rate of 4.0l/s to High Park.

The material assets (surface water, foul water and watermain networks) will be pressure tested to relevant Dublin City Council and Irish Water standards prior to completion of the works. The drainage networks will also be CCTV surveyed and reviewed to ensure there are no defects. These test measures will ensure to a reasonable degree that the pipes have been installed to the required standard and the risk of leakage will be greatly reduced.

7.8 PREDICTED IMPACTS

Construction Phase

There are no predicted significant impacts arising from the construction phase due to the temporary nature of construction and the expected use of portable or temporary toilets only, which will be contracted out to an authorised disposal agent.

A wide range of mitigation measures have been specified for the construction and operational phases of the project. These mitigation methods seek to ensure that construction and operational discharges are controlled to prevent potential pollution impacts to all receiving surface water systems.

Operational Phase

No negative residual impacts are anticipated with the implementation of the construction and operational mitigation measures as stated.

7.9 'DO NOTHING' SCENARIO

Under a 'Do Nothing' scenario there would be no change in the site's current use, and there would no change to the impacts to the water environment over the existing scenario. The site in its existing state does not give rise to any significant emissions to any surface water bodies or foul network system.

7.10 WORST CASE SCENARIO

No significant effects on hydrology and water services are anticipated. However, any failure is likely to be due to the incorrect installation of SuDS causing a reduction in treatment of surface water or a pipe leakage resulting in contamination of ground water. The correct implementation of the mitigation measures outlined above (especially the correct installation of the material assets at construction stage) will appropriately minimise this risk.

7.11 MONITORING & REINSTATEMENT

The construction of works will be monitored to ensure compliance with relevant local authority requirements, and health and safety legislation.

The operational phase of public works will be monitored by the local authority responsible for the respective asset.

The operational phase of private assets will be monitored by the management company for the building.

After construction, all assets are to be backfilled and reinstated in accordance with the design and relevant local authority and Irish Water requirements.

7.12 DIFFICULTIES IN COMPILING INFORMATION

No particular difficulties were encountered in completing this section.

7.13 REFERENCES

1. Hydrocare Environmental Ltd (2022) Site Specific Flood Risk Assessment Report (submitted with this planning application)
2. Joseph O'Reilly Consulting Civil & Structural Engineers (2022) Engineering Services Report (submitted with this planning application)
3. Irish Water existing services records (2021)
4. EPA On Line Mapping

8 NOISE AND VIBRATION

8.1 INTRODUCTION

This Chapter of the EIAR has been prepared by AECOM Ltd with input from the project team. This chapter provides an assessment of the potential noise and vibration impacts of the Strategic Housing Development on a site at Swords Road, Whitehall, Dublin 9 (to be known as Hartfield Place), in accordance with the requirements of the relevant EIA legislation and guidance on preparation and content of EIAR.

The Proposed Development have the potential to affect noise and vibration due to:

- Noise and vibration levels from construction works;
- Noise from the Proposed Development during operation (specifically in relation to building plant); and
- Noise associated with road traffic movements attributable to the Proposed Development.

Details of terminology relevant to this chapter are provided in Appendix 8.1: Noise and Vibration.

8.2 METHODOLOGY

This noise and vibration assessment has been prepared in accordance with the EPA ‘Guidelines on the Information to be contained in Environmental Impact Statements, 2002’, ‘Advice Notes on Current Practice (in preparation of Environmental Impact Statements’, the ‘Guidelines on the information to be contained in Environmental Impact Assessment Reports’ (EPA DRAFT August 2017), National Road Authorities ‘Guidelines for the Treatment of Noise and Vibration in National Road Schemes’ 2004 and The Dublin City Development Plan 2016-2022.

Section 16.36 of Dublin City Development Plan 2016-2022 states that: “*Dublin City Council will have regard to the Dublin Agglomeration Noise Action Plan 2013-2018 when assessing planning applications*”. The Dublin Agglomeration Noise Action Plan 2013-2018 (DANAP) was produced by four Local Authorities to avoid, prevent and reduce the harmful effects of noise from road traffic, rail and aircraft. It will be used in this instance to determine the impact of noise from these sources in the vicinity of the application site. The document contains absolute noise thresholds for desirable low and undesirable high sound levels.

In the absence of a specific Irish standard for assessing the impact of transportation noise on residential developments, it is usual to rely upon UK guidance as international standards.

Consultation

The Dublin City Council(DCC) issued comments on the Stage 2 pre-application which included a report from the Environmental Health Officer (EHO) dated 9th November 2021. The EHO has recommended conditions and provided comments on the necessary of Construction Management Plan, retail/cafe units and general plant serving the buildings, and the use of Gym. All of the comments have been taken into account in the assessments.

Suitability of Site for Residential-led Development

The suitability of the Site for residential-led development has been assessed and details are provided on suitable glazing and ventilation strategies in order to achieve the indoor ambient noise levels recommended in BS 8233:2014 ‘Sound insulation and noise reduction for buildings – Code of practice’. Guidance levels from BS 8233

and the World Health Organization (WHO) ‘Guidelines for Community Noise’ (1999) for external noise will be considered when assessing any external amenity areas.

Indoor Ambient Noise (External Noise Sources)

The recommended noise criteria relating to internal ambient noise resulting from external noise sources within the Hartfield Place residential and non-residential spaces and associated reference noise guidance is given in Table 8.1 and Table 8.2 below.

Location	Criteria (dB)	Reference
Residential living room	Daytime (07:00-23:00) 35 dB $L_{Aeq,16h}$	BS 8233:2014
Residential bedroom	Night time (23:00-07:00) 30 dB $L_{Aeq,8h}$ 45 dB L_{AFmax}	ProPG / BS 8233:2014

Table 8.1 Indoor ambient noise levels in dwellings

Location	Criteria (dB)	Reference
Corridor, circulation spaces, entrance lobby	45-55 dB $L_{Aeq,T}$	BS 8233:2014
Restaurant	40-55 dB $L_{Aeq,T}$	
Department store/Cafeteria	50-55 dB $L_{Aeq,T}$	
Gym	45 $L_{Aeq,T}$ NR40 (L_{eq})	Building Bulletin 93 (BB93) ¹ – Sports Hall Sport England ²

Table 8.2 Indoor ambient noise levels in non-domestic buildings

To achieve the internal noise levels for residential areas (summarised in **Error! Reference source not found.**), external noise ingress must be controlled by the building façade. Some flexibility to the internal $L_{Aeq,T}$ noise criteria is provided by BS 8233 is provided in the statement that:

“Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.”

Reference will also be made to Professional Practice Guidance: Planning and Noise in 2017 (ProPG), which was jointly produced by the Institute of Acoustics, the Association of Noise Consultants, and the Chartered Institute of Environmental Health. ProPG provides planning guidance for the consideration of new residential development that will be exposed predominantly to airborne noise from transport sources. The document provides advice on how guidance within BS 8233:2014 and WHO Guidelines for Community Noise may be applied to improve in the consistency and quality of plan-making and decision-taking in relation to acoustic matters.

Internal Ground-borne Noise & Vibration

The NRA 2004 Guidelines note that ground vibrations produced by road traffic are unlikely to cause perceptible structural vibration in properties located near to well-maintained and smooth road surfaces. As a result, groundborne noise from M50 tunnels are unlikely to have a significant impact on the proposed residential units.

¹ Acoustic design of schools: performance standards - Building Bulletin 93, Department for Education and Education Funding Agency, February 2015

² Sport England, Design Guidance Note – Fitness and Exercise Spaces, March 2008, Revision 002

No further vibration assessment was undertaken. Any further vibration assessment will be undertaken at detailed design stage.

Reference was made to the vibration dose values in BS 6472-1:2008 'Guide to evaluation of human exposure to vibration in buildings - Vibration sources other than blasting'. No ambient vibration was experienced during site visits, which indicate that there is a low probability of adverse comment due to road traffic induced vibration in residential units.

Outdoor Amenity Areas

Guidance provided in BS 8233 states a lower guideline noise level of 50 dB $L_{Aeq,16h}$ for outdoor amenity areas (e.g. gardens and patios). An upper guideline level of 55 dB $L_{Aeq,16h}$ is considered acceptable in higher noise environments, such as sites near strategic transport links. Given the urban location of the Site, it is considered that the upper level of 55 dB $L_{Aeq,16h}$ is considered reasonable for the Proposed Development.

It is accepted in BS 8233 that achieving the guideline values may not be practicable in high noise environments such as city and town centres. Consequently, it is considered appropriate that balconies and outdoor amenity areas within the Proposed Development be designed to achieve as low noise level as practicable through screening, landscaping or building design.

Construction Impacts

Dublin City Council Guidelines

Reference is made to the DCC Noise Action Plan, and, in particular, the following comments that are made in relation to construction noise:

Hours of Work(CDP -16.35) On sites where noise generated by construction would seriously affect residential amenity, the site and building works must be carried out between 0700 and 1800 hours Monday to Friday only, and between 0800 and 1400 hours on Saturdays only. No works shall be carried out on Sundays or bank holidays. However, deviation from these times may be permitted in exceptional circumstances, where prior written approval has been received from Dublin City Council. Such approval may be given subject to conditions pertaining to the particular circumstances being set by Dublin City Council.

Noise (CDP – 16.36) Dublin City Council will have regard to the Dublin Agglomeration Noise Action Plan 2013–2018 when assessing planning applications (see also Section 9.5.8). Where it is considered that a proposed development is likely to create a disturbance due to noise, a condition may be imposed by the planning authority on any planning permission limiting the hours of operation and level of noise generation.

7.12.5 *Noise Complaint Investigation and Control procedures.* Whilst the noise maps and the Environmental Noise Regulations are aimed at developing strategic policy, it is acknowledged that when most people complain about noise, it relates more to local issues such as neighbour, entertainment and construction noises. However, it is envisaged that the noise action plan should mainly concentrate on strategic issues identified by the noise mapping. Systems are already in place to deal with noise nuisances, including neighbour, entertainment and construction noises – see paragraph 7.4 Dublin City Council’s Noise Nuisance Policy, which Dublin City Council will continue to adopt.

**Dublin City Council’s Noise Nuisance Policy
Construction site causing noise**

Dublin City Council investigates complaints regarding noise nuisance caused by construction sites. Construction sites, by their very nature, can create a great deal of noise, with some activities e.g. pile driving, causing particular disturbance. The aim of investigations is to determine compliance with the principles of best practice with regard to the minimisation of noise from the site. Construction site work starting early in morning or continuing late into the evening: The permissible hours of operation of a building site within Dublin City are; Monday to Friday 07.00 – 18.00 Saturday 08.00 – 14.00 Sundays and Public Holidays No noisy work on site. These hours are often specifically conditioned at the planning permission stage, and therefore are enforced by the Planning Enforcement Section of Dublin City Council.

In the event that a planning condition has not been applied regarding hours of operation, the Air Quality Monitoring and Noise Control Unit will deal with the complaint. To complain about a construction site causing noise contact Dublin City Council’s Customer Services.

National Roads Authority (NRA) ‘Guidelines for the Treatment of Noise and Vibration in National Road Schemes’ (2014) states that “where it is deemed necessary to predict noise levels associated with construction activities, this should be done in accordance with a recognised standard such as BS5228: Part 1”. The impact of construction noise and be assessed qualitatively according to guidance in BS 5228-1 (and update A1:2014) ‘Code of practice for noise and vibration control on construction and open sites – Part 1: Noise’ with reference to plant noise data and calculation methodologies.

Vibration risks have been assessed based on the types of plant used and their proximity to receptors, using guidance in BS 5228-2:2009 (and update A1:2014) ‘Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration’ and BS 7385-2:1993 ‘Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground-borne vibration’.

Construction Noise

In Ireland, there are no statutory guidelines relating to noise limits for construction and demolition activities. These are generally controlled by local authorities and commonly refer to limiting working hours to prevent a noise nuisance. NRA’s 2004 Guidelines have outlined recommended noise levels for construction noise during road works.

Although the recommendations in the NRA’s 2004 Guidelines refer to road projects, they have been developed in line with typical construction noise limits on construction projects used previously in Ireland. The limits outlined represent a reasonable compromise between the practical limitations during a construction project and the need to ensure an acceptable ambient noise level for local residents. As a result, these limits have become the most acceptable standard for construction noise limits for EIA in Ireland to date.

However, the NRA 2004 guidelines do note that, where pre-existing noise levels are particularly low, more stringent levels maybe more appropriate. Table 8.3 details these recommended limits.

Day & Times	Noise Levels dB(A)	
	L_{Aeq} 1 hour	L_{Amax}
Monday to Friday 07:00 to 19:00 hrs	70	80
Monday to Friday 19:00 to 22:00 hrs	60	65
Saturday 08:00 to 16:30 hrs	65	75
Sunday and Bank Holidays 08:00 to 16:30 hrs	60	65

Table 8.3 NRA Maximum Permissible Noise Levels at the Facade of Dwellings during Construction

Construction Vibration

Vibration is normally perceptible at around 0.5mm/s and may become disturbing or annoying to receptors in the case of nominally continuous source of vibration such as road traffic. Typically, higher levels of vibration are tolerated by receptors for single events, or events of short duration, at levels not normally acceptable for continuous sources.

With regard to the potential for vibration damage during construction and demolition, the NRA recommends that vibration from road construction activities be limited to the values set out in Table 8.4. These values have been derived through consideration of the various standards described above.

These should be adhered to at all times during the construction phase of the Proposed Road Development.

Frequency:	Less than 10 Hz	10 to 50 Hz	50 to 100 Hz and above
Allowable vibration velocity (Peak Particle Velocity) at the closest part of any sensitive property to the source of vibration:	8 mm/s	12.5 mm/s	20 mm/s

Table 8.4 Typical Allowable Vibration during Road Construction in Order to Minimise the Risk of Building Damage

Construction Traffic

Road traffic noise levels will be calculated with reference to methodology within CRTN which contains an equation for the calculation of the Basic Noise Level (BNL) from a road in terms of the 18-hour Average Annual Weekday Traffic (AAWT) flow from 06:00 to 24:00.

The magnitude of a noise impact due to changes in road traffic noise levels has been assessed with reference to criteria outlined in Highways England’s ‘Design Manual for Road and Bridges Volume 11 Section 3 Part 7 Traffic Noise and Vibration’ (DMRB). The criteria used for the assessment of changes in road traffic noise levels arising from construction works have been taken from Table 3.54a of DMRB and are provided in Table 8.5 below.

Magnitude of Impact	Change in BNL LA10,18h
Very Low	Less than 1.0 dB
Low	Greater than or equal to 1.0 dB and less than 2.9 dB
Medium	Greater than or equal to 3.0 dB and less than 4.9 dB
High	Greater than or equal to 5.0 dB

Table 8.5 Road Traffic Noise – Magnitude of Impact

Complete and Occupied Operational Impacts

Where information is available, building services noise associated with the operation of the completed Proposed Development will be assessed in line with BS 4142:2014+A1:2019 ‘Methods for rating and assessing industrial and commercial sound’. Suitable criteria to control noise due to operation of mechanical services equipment affecting surrounding existing NSRs as well as future users of the Proposed Development are provided.

Noise emissions associated with non-residential uses as part of the Proposed Development has also been considered and where necessary recommendations for appropriate controls will be included.

8.3 RECEIVING ENVIRONMENT

Summary of Existing Baseline Context

The dominant sound source at the Site is road traffic on R132 Swords Road which is located along the western boundary of the Site. Additional sound sources include road traffic on surrounding roads (in particular R103 Collins Avenue located approximately 150 to 200 metres (m) to the north of the Site) and sporting activities at the Whitehall GAA Pitch located directly to the northeast of the Site.

AECOM has undertaken noise monitoring at the Site on 11th November 2020, along the western Site boundary facing Swords Road. Noise measurements were carried out in accordance with ISO 1996-1:2016 ‘Acoustics – Description, measurement and assessment of environmental noise – Part 1: Basic quantities and assessment procedures’ and British Standard (BS) 7445-1:2003 ‘Description and measurement of environmental noise – Part 1: Guide to quantities and procedures’. Noise levels as a result of external noise sources are summarised below in Table 8.6.

Facade	Period	Noise Parameter	External Noise Level (dB)
Swords Road residential facades / Residential facades close to Swords Road with direct line of sight to the traffic	Daytime	L _{Aeq,16hr}	72
	Night time	L _{Aeq,8hr}	69
		L _{AFMax}	81
Remaining residential facades and commercial areas	Daytime	L _{Aeq,16hr}	62
	Night time	L _{Aeq,8hr}	59
		L _{AFMax}	71

Table 8.6 Summary of measured noise levels around the development (free-field data)

The M50 Dublin Port Tunnel runs underneath the Site however no noticeable levels of vibration were experienced during the November 2020 site visits.

Sensitive Receptors

Noise sensitive receptors (NSR) are located around the Site boundary at the following locations:

- R1: Beech Lawn Nursing Home which is located along the eastern site boundary (about 25m);
- R2: Highfield Healthcare Alzheimer’s Care Centre which is located along the southern site boundary about 25m;
- R3: Clonturk Community College which is located approximately 80m to the southwest of the nearest site boundary; and
- R4: Residential properties along Swords Road and Iveragh Road to the west, the nearest of which are located approximately 40m from the site boundary.

8.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will consist of the construction of 7 no. blocks in heights up to 8 storeys (over single level basement) comprising 472 no. apartment units, a creche, café unit, and internal residential amenity space. The proposal also includes car, cycle, and motorcycle parking, public and communal open spaces, landscaping, bin stores, plant areas, substations, switch rooms, and all associated site development works and services provision. Access is provided from the development from Swords Road with associated upgrades to the existing public road and footpaths. A full description of the development is provided in the statutory notices and in Chapter 3 of the EIAR submitted with the application.

8.5 ASSESSMENT OF SITE SUITABILITY

This section assesses the suitability of the Site for development in respect of existing noise and vibration conditions and the proposed end uses of the Proposed Development.

Internal Noise Levels within Buildings

To achieve the internal noise levels detailed in Table 8.1, external noise ingress must be controlled by the building facade. Glazing recommendations are given below using the (R_w+C_{tr}) index, a commonly used single figure term used to specify the sound insulation requirements of facades affected by traffic noise (i.e. urban road traffic and low speed rail noise), and are provided as three numerical values, for example 4-16-6. These values relate to the: glazing thickness-air gap-glazing thickness, each in millimetres (mm).

Table 8.7 below provides the mitigation performance required for the worst affected façades in order to meet internal noise level requirements within the Proposed Development and an example of glazing that may achieve this performance. The north facing façades of buildings at Plots A, D, G and J are in close proximity to train tracks so require different treatment to ensure that occupants are not disturbed by train movements at night.

Facade	Recommended Glazing Specification R_w+C_{tr} dB	Example Glazing Configuration
Swords Road residential facades / Residential facades close to Swords Road with direct line of sight to the traffic (Block A, B, C North, East and West façades)	36	8/16/10.8 mm acoustic laminate glazing
Remaining residential facades and commercial areas (South facades of Blocks A, B, C, and all facades for Blocks D, E, F & G)	31	6/16/8 mm Thermal double glazing

Table 8.7 Site Suitability Assessment Glazing Requirements

Noise from HGV and bus movements at night may result in sleep disturbance to occupants of residential accommodation. Analysis of noise data measured provides a representative worst-case L_{AFmax} of 81 dB due to HGV and bus movements, which is considered equivalent to the highest level of L_{AFmax} noise that may affect building façades directly exposed to train or HGV noise at night.

The simplest form of mitigation would be to design buildings to avoid bedrooms on façades directly exposed to train or HGV noise. However, if bedrooms are planned on these façades, they should achieve WHO Guidelines recommendations that an internal L_{AFmax} level of 45 dB is not exceeded.

Ventilation

Due to the ambient noise levels around the Site and the proximity to main roads, windows would be required to be closed to achieve internal noise criteria; as such alternative forms of ventilation to opening windows will be required. When windows are opened (e.g. for purge ventilation) then internal ambient noise criteria may be exceeded, although opening windows for the purposes of ventilation would be at the discretion of the room occupants. The attenuation performance of any alternative ventilation system must be specified to achieve a value of no less than that provided by the glazed element of the façade.

Windows and ventilation systems should be acoustically sealed and fitted with high standards of workmanship. Poorly fitting windows and build quality can decrease sound insulation performance significantly. It should be

noted that the glazing specifications provided above are for acoustic purposes only and, therefore, any structural, safety, thermal or other issues will require to be addressed separately by the appropriate specialists.

Outdoor Amenity Areas

There are balconies proposed on the facades that either directly facing or have direct line of sight to the traffic on Swords Road. Noise levels within these balconies will exceed the upper threshold for outdoor amenity areas of 55dB $L_{Aeq,16h}$.

Good acoustic design principles will be followed to provide the best acoustic environment practicable in balconies in these building façades. This could be provided through solid, continuous balustrades to screen balcony areas from noise source. The acoustic design of any outdoor amenity areas will be finalised at the detailed design stage.

Where noise criteria in outdoor amenity areas are not achievable, PPG provides advice on how impacts may be offset. Where a good acoustic design process has been followed, exceedances of the upper threshold may be partially off-set if the residents are provided with access to:

- “a relatively quiet façade (containing openable windows to habitable rooms) or a relatively quiet externally ventilated space (i.e. an enclosed balcony) as part of their dwelling; and/or
- A relatively quiet alternative or additional external amenity space for sole use by a household (e.g. a garden, roof garden or large open balcony in a different, protected location); and/or
- A relatively quiet, protected nearby, external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or
- 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).”

It is considered that the communal open spaces and public open spaces within the Proposed Development, which provide communal amenity spaces that can be accessed by all residents and provide adequate outdoor space to offset any exceedances of the desired outdoor amenity level after good acoustic design principles have been followed. As these communal spaces are further away from the main road and the proposed buildings provide noise shielding to road traffic noise, noise within these spaces is expected to be below the recommended 50-55dB.

8.6 POTENTIAL IMPACTS

Construction Phase

Construction Noise

Details of enabling and construction work are not going to be finalised until a contractor is appointed and therefore a quantitative assessment will not be possible, instead the assessment focusses on complying with best practice principles to minimise noise and vibration.

Noise emissions and resulting impacts are likely to vary during the different construction phases of the project depending upon the location of work sites and proximity of receptors. However, for typical developments of this nature, noise impacts are likely to be greatest during the piling and substructure of the proposed works.

Noise levels of plant used to break hard surfaces, such as piling rigs and tower cranes, are listed in BS 5228-1 and are in the range 80-85 dB $L_{Aeq,T}$ at a distance 10 m. Noise levels can be above 70 dB $L_{Aeq,T}$ within approximately 25 m (where the nearest noise sensitive receptors are identified) of these types of activities, depending on the chosen plant and the methods applied. However, a worst-case scenario with the plant working at the closest approach is likely to be limited to a number of days and there would be regular periods, even during the course of a single day, when the assumed noisy plant will not be in operation during breaks or changes of working routine. Therefore,

accounting for these factors, it is predicted that receptors R1-R4 is considered to experience noise levels of Medium to High magnitude of impact and therefore result in a Temporary Moderate to Major Adverse effect.

As an exceedance of the noise levels in Table 8.3 represents noise that is considered to be noticeable and intrusive, mitigation measures and noise management plans as outlined in Section 8.8 and a Construction Environmental Management Plan (CEMP) will be put into place to ensure that construction noise is minimised at all times throughout the construction programme.

It is noted that the DCC EHO in their response to Stage 2 pre-application has recommended a planning condition for a Construction Management Plan to be prepared by the awarded contractor in the response to consultation. This plan shall be developed with reference to the Good Practice Guide for Construction and Demolition produced by the Air Quality Monitoring and Noise Control Unit of Dublin City Council. The Dublin City Councils' Guide has been produced with reference to the London Good Practice Guide: Noise and Vibration Control for Demolition and Construction produced by the London Authorities Noise Action Forum, July 2016 is being prepared and will be submitted as part of the planning application.

Construction Vibration

Based on the estimated distances (>20m) from identified sensitive receptors to the nearest buildings in the Proposed Development, potential vibration levels affecting sensitive receptors during typical construction activities are not expected to exceed the levels defined in Table 8.4, however, as construction vibration may be noticeable and intrusive, mitigation measures covering BPM will be put into place to ensure that vibration is minimised at all times throughout the construction programme.

Construction Traffic

Noise effects that may arise due to construction traffic flows have been assessed based on information presented in EIAR Chapter 11: Transport. The projected percentage impact of the construction traffic on the surrounding road junctions during the opening year (2026) ranges from 2.6% to 9.5%. CRTN equations have been applied to the traffic data to calculate the impact of noise due to construction traffic associated. Based on the highest 9.5% impact due to construction traffic, calculated change in noise levels is about 0.5dB. In accordance with criteria presented in Table 8.5, an increase of this magnitude is Very Low, and not significant.

Opening Year	Junction	% Impact	Changes in Noise Levels (dB)
2023	Site 1 - Swords Road / Collins Avenue West	2.9	0.1
	Site 2 - Swords Road / Iveragh Road / Site Access	9.5	0.5

Table 8.8 Construction Noise Assessment

Operational Phase

Operational Road Traffic Noise Effects

Noise effects that may arise due to operational traffic flows have also been assessed based on information presented in EIAR Chapter 11: Transport. The projected percentage impact of the operational traffic on the surrounding road junctions during the opening year (2026) ranges from 1.2% to 5.6%. CRTN equations have been applied to the traffic data to calculate the impact of noise due to construction traffic associated. Based on the highest 9.5% impact due to construction traffic, Calculated change in noise levels is about 0.2dB. An increase of this magnitude is Very Low, and construction noise impact is not significant.

Opening Year	Junction	% Impact	Changes in Noise Levels (dB)
2023	Site 1 - Swords Road / Collins Avenue West	1.4	0.1
	Site 2 - Swords Road / Iveragh Road / Site Access	5.6	0.2

Table 8.9 Operational Noise Assessment

Building Services Plant Noise Effects

Based on the recommendation in the DCC EHO's response to Stage 2 pre-application, it is recommended that the cumulative noise emissions from building services units associated with the proposed development are controlled (by selection of quieter plant equipment and adopt noise attenuation measures) so that it does not exceed the typical measured background noise level (L_{A90}) by 5dB.

Noise from Gym and Commercial Use

There is a café and a creche below the habitable places. It is recommended that a noise limit of NR15 (L_{eq}) within bedrooms and NR20 (L_{eq}) within living rooms from the operation of these commercial units and ancillary spaces (and associated plant) is incorporated into tenancy agreements to ensure that sufficient sound insulation and noise control measures are carried out by the prospective tenants.

8.7 POTENTIAL CUMULATIVE IMPACTS

Cumulative noise effects on the identified receptors may result in the event that construction works at Cumulative Schemes (especially the proposed development site to the north of Hartsfield Place site as identified within the Whitehall Framework Plan) take place simultaneously with construction activities at the Proposed Development.

The precise scale of additional noise effects will be dependent on the exact works taking place at each location at any one time; however, the use of site hoardings and compliance with the mitigation measures detailed within the CEMP will reduce these effects as far as possible. It has been assumed that the other developments will also be required to adoption of CEMP and BPM as standard working practices during their demolition and construction phases and that noise and vibration levels will comply with set limits. Consequently, it is unlikely that there will be an additive noise effect therefore cumulative construction noise effects are likely to be not significant.

Communications should be undertaken with the Cumulative Schemes so that, where practicable, works can be scheduled to minimise the exposure of sensitive receptors to significant adverse cumulative levels of construction noise for extended periods of time due to simultaneous activities on adjacent sites. Mitigation measures set out within the agreed CEMP will be applied during all demolition and construction activities to reduce adverse levels of cumulative construction noise and vibration as far as reasonably practicable.

As stated in the traffic assessment, the potential cumulative effects in the context of traffic have been included in the overall assessment as traffic associated with development proposals and background growth have been included in the traffic forecasts used for the traffics noise assessment in this chapter. Consequently, cumulative construction and operational traffic noise effects are equivalent to effects presented in Section 8.6 and not significant.

8.8 MITIGATION MEASURES

Construction Phase

Mitigation measures that are typically applicable to construction sites will be included within the CEMP that have been prepared for the Proposed Development. The CEMP will include the relevant noise and vibration criteria, proposed surveys and a range of BPM giving regard to the guidance in BS 5228.

The application of Best Practicable Means (BPM) through the implementation of the CEMP will ensure construction noise and vibration impacts are minimised. Examples of BPM from BS 5228 will be implemented during construction works are presented below:

- Unnecessary revving of engines will be avoided and equipment will be switched off when not in use;
- Internal haul routes will be kept well maintained;
- Rubber linings in, for example, chutes and dumpers will be used to reduce impact noise;
- Drop heights of materials will be minimised;
- Plant and vehicles will be sequentially started up rather than all together;
- Plant will always be used in accordance with manufacturers' instructions. Care will be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading will also be carried out away from such areas; and
- Regular and effective maintenance by trained personnel will be undertaken to keep plant and equipment working to manufacturer's specifications.

During the construction phase of the Proposed Development, appropriate mechanisms to communicate with local residents would be set up to highlight potential periods of disruption with appropriate complaint procedures put in place.

Operational Phase

The Proposed Development has been designed to ensure that suitable glazing is selected so that desirable internal noise conditions are achieved. The assessment in Section 8.5 applies a simple calculation method to ensure that the required level of noise attenuation can be achieved by glazing. The glazing scheme will be finalised in the detailed acoustic design of the Proposed Development.

It is assumed that the building services plant will be designed to achieve the operational limits consistent with the requirements of BS 4142 which may require mitigation to be incorporated into the fixed plant design (see section 'Methodology for Determining Operational Effects – Building Services and Plant Noise'). Should the noise exhibit any such acoustic features then the relevant penalty/ correction should be applied in accordance with BS 4142 to ensure that the resultant rating level falls within the limit levels.

8.9 RESIDUAL EFFECTS

With the incorporation of the above mitigation and CEMP in place, construction noise are likely to be a Temporary Moderate Adverse effect, which is not considered to be significant. Construction vibration at nearby sensitive receptors are well below the limits and not significant. The construction traffic noise impacts are very low and also not significant.

With suitable external building fabric (including glazing and ventilation), the site is considered to be suitable for the proposed residential use.

8.10 DO NOTHING SCENARIO

If the proposed development were not to proceed, noise levels in the locality will remain unchanged as there will be no additional traffic movements or construction noise as a consequence of the proposed development. In addition, there will not be any additional receptors introduced to the locality to be exposed to existing noise levels.

There will be a natural increase in traffic flows over time, but the predicted levels of increase will not cause a noticeable difference in the noise levels on the site.

8.11 WORST CASE SCENARIO

For construction effects, the worst case has been assessed which considers the highest noise generating activities throughout the construction programme. The assessment considers noise effects for an average day during the peak month of construction associated traffic movements.

For effects during occupation, the worst case has been assessed which considers noise at the worst affected façade of buildings in the Proposed Development.

8.12 MONITORING AND REINSTATEMENT

Monitoring during Construction

The need for noise and vibration monitoring and potential monitoring locations will be the subject of discussion between the contractor and Dublin City Council (DCC). Noise and vibration monitoring would allow periods where elevated noise and vibration levels arise be identified and allow works to be halted or alternative working practices to be explored. The contractor will need to adhere to any site-specific noise monitoring related conditions imposed by DCC. Any incidents of noise limits being exceeded will be reported by the contractor to the Applicant to forward to the DCC as soon as is practical.

Monitoring during Operational Phase

When the residential development is operational it will not result in an increase in noise and vibration levels at any of the sensitive locations beyond the site boundary therefore no monitoring is deemed necessary.

8.13 DIFFICULTIES IN COMPILING INFORMATION

Details of enabling and construction work are not going to be finalised until a contractor is appointed and therefore a detailed quantitative assessment will not be possible. Instead worst case assessment was undertaken considering the highest noise generating activities throughout the construction programme. A Construction Environmental Management Plan is being prepared and will be submitted as part of the planning Application.

8.14 REFERENCES

Guidelines on the Information to be contained in Environmental Impact Statements, 2002', 'Advice Notes on Current Practice (in preparation of Environmental Impact Statements' (EPA 2002)

Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA DRAFT August 2017)

Guidelines for the Treatment of Noise and Vibration in National Road Schemes' (NRA 2004)

Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes' (NRA 2014)
Calculation of Road Traffic Noise 1988 (The Stationery Office, 1988)

BS 5228-2:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1:
Noise' (BSi 2014)

BS 5228-2:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 2:
Vibration' (BSi 2014)

BS 6472:1992 Guide to Evaluation of Human Exposure to Vibration in Buildings (BSi 1992)

BS 7385: Part 2 1990: Evaluation and Measurement for Vibration in Buildings – Guide to Damage Levels from
Ground-Borne Vibration (BSi 1990)

ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise – New Residential Development –
May 2017

Dublin City Development Plan 2016-2022

Dublin Agglomeration Environmental Noise Action Plan December 2013 – November 2018

9 CLIMATE & AIR QUALITY

9.1 INTRODUCTION

This section identified and assessed the potential air quality and climatic impacts associated with the proposed development both the construction and operational phases of the development.

It includes a comprehensive description of

- the existing air quality and climate at and in the vicinity of the subject site,
- how the construction and operational phases of the development may impact existing air quality and finally,
- the mitigation measures that shall be implemented to control and minimise the impact that the development may have on local ambient air quality and reduce the impact on the local micro climate.

Proposed Development Site Location and Brief Description

This is as described in chapters 1 (introduction) and 3 (Description of Development) of this EIAR and as set out in the statutory notices.

Statement of Competence

In accordance with Article 5(3)(a) of the EU Directive, by appointing Traynor Environmental, the applicant has ensured that this chapter has been prepared by “Competent experts”. This chapter was prepared by Nevin Traynor BSc. Env, H.Dip I.T, Cert SHWW of Traynor Environmental Ltd. Nevin is a Senior Environmental consultant and director of the company established in 2004. Traynor Environmental have 17 years’ experience as environmental consultants, offering specialist advice in respect of a wide range of environmental disciplines. The company have been involved in numerous Strategic housing projects and EIA preparation over the last number of Years.

9.2 METHODOLOGY

The general assessment methodology of the potential impact of the proposed development on air quality and climate has been devised in accordance with:

- 2017 EPA Guidelines on information to be contained in Environmental Impact Assessment Reports.
- 2017 EC Guidance “Guidance on the preparation of the Environmental Impact Assessment Reports”
- Guidelines on Information to be Contained in an Environmental Impact Statement (EPA 2002).
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DoHPLG, August 2018).
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003).
- Environmental Protection Agency, 2015. Revised Guidelines on the Information to be Contained in Environmental Impact Statements.
- Environmental Protection Agency, 2015. Draft Advice Notes for Preparation of Environmental Impact Statements.
- Environmental Impact Assessment (EIA), Guidance for Consent Authorities Regarding Sub-Threshold Development (DoEHLG 2003).
- Development Management Guidelines (DoEHLG, 2007).
- European Union (Planning & Development) (Environmental Impact Assessment Regulations 2018).
- Design Manual for Roads and Bridges (DMRB).

Baseline Environment

The existing ambient air quality in the vicinity of the site has been characterised with information obtained from a number of sources including EPA Annual Air Quality in Ireland Reports and Local air monitoring stations data. The ambient air quality data collected and reviewed for the purpose of this study focused on the principal substances (dust, vehicle exhaust emissions and boiler emissions) which may be released from the site during the construction and operation phases and which may exert an influence on local air quality.

Air Quality Standards and other Relevant Guidance

Air quality standards and guidelines are available from a number of sources. The guidelines and standards referenced in this report include those from Ireland and the European Union.

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 (Ref Table 9.1). Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values.

The applicable standards in Ireland include the National Air Quality Standards Regulations 2011 (S.I No. 180 of 2011), which implement European Commission Directive 2008/50/EC which has set limit values for the pollutants SO₂, NO₂, PM₁₀, benzene and CO Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC). Provisions are also made for the inclusion of new ambient limit values relating to PM_{2.5}. The European 2008/50/EC Clean Air for Europe (CAFÉ) Directive is the current air quality directive for Europe which supersedes the European Directives 1999/30/EC and 2000/69/EC.

In order to assess a wider range of air pollutants in the development area it is necessary to review current air quality monitoring data from published sources such as the most recent EPA’s 2020 Annual report entitled Air Quality in Ireland. This EPA report provides detailed monitoring data collected from a number of monitoring locations throughout Ireland on an annual basis to assess national compliance with National Air Quality Regulations. The location of the site in Swords Road, Whitehall, Dublin 9 is characterised as a Zone A area as defined by the EPA. Available EIAR climate & air quality characters for neighbouring sites have been reviewed in preparing this EIAR.

EU legislation on air quality requires that Member States divide their territory into zones for the assessment and management of air quality. The zones currently in place in Ireland in are as follows:

- Zone A is the Dublin conurbation,
- Zone B is the Cork conurbation
- Zone C comprising 23 large towns in Ireland with a population >15,000.
- Zone D is the remaining area of Ireland.

The zones changed on 1 January 2013 to reflect the results of the 2011 census.

The air quality in each zone is assessed and classified with respect to upper and lower assessment thresholds based on measurements over the previous five years. Upper and lower assessment thresholds are prescribed in the legislation for each pollutant. The number of monitoring locations required is dependent on population size and whether ambient air quality concentrations exceed the upper assessment threshold, are between the upper and lower assessment thresholds, or are below the lower assessment threshold.

Design Manual for Roads and Bridges (DMRB) Guidelines.

The DMRB Model is based on the UK Highway Agency’s DMRB and adapts it for use on national roads in Ireland through a series of implementation documents. Due to the lack of such a model in Ireland the UK DMRB was used to predict vehicle emissions from the new development.

DMRB Volume II, section 3, Part 1 Air Quality provides a screening model which is used to predict vehicle emissions for NO₂, NO_x, PM₁₀, carbon monoxide, benzene and 1,3-butadiene at sensitive receptors which have potential to be affected by the proposed development.

The DMRB model requires a number of inputs such as traffic flow (AADT), speed and vehicle mix and annual background pollutant concentrations. Background pollutant concentrations according to air zone were attained by averaging seven years of data, from yearly EPA air quality reports for 2014-2020. Predicted concentrations for the construction and operation phases of the project were compared with the Irish ambient air quality standard – S.I. No.180 of 2011 – Air Quality Standards Regulations 2011. These regulations set limit values and averaging periods, which are used to assess the impact of emissions on human health, vegetation and ecosystem.

Key pollutant concentrations were predicted for nearby sensitive receptors for the following scenarios:

- The baseline scenario (2019), for model verification;
- Do-Nothing scenario (DN), which assumes the retention of present site usage with no development in place (2026);
- Year Do-Something scenario (DS), which assumes the proposed development in place (2026);
- Design Year Do-Nothing scenario (DN), which assumes the retention of present site usage with no development in place (2041); and
- Design Year Do-Something scenario (DS), which assumes the proposed development in place (2041).

The assessment methodology involved using the DMRB Screening Model (Version 1.03c, July 2007), the NO_x to NO₂ Conversion Spreadsheet (Version 5.1, June 2016), and following guidance issued by the TII, and the EPA. The TII guidance states that the assessment must progress to detailed modelling if:

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

The TII 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:

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

Concentrations of key pollutants are calculated at sensitive receptors that have the potential to be affected by the proposed development. For road links which are deemed to be affected by the proposed development and within 200 m of the chosen sensitive receptors inputs to the air dispersion model consist of: road layouts, receptor locations, annual average daily traffic movements (AADT), percentage heavy goods vehicles, annual average traffic speeds and background concentrations. **The DMRB guidance states that road links at a distance of greater than 200 m from a sensitive receptor will not influence pollutant concentrations at the receptor.** Using this input data, the model predicts the road traffic contribution to ambient ground level concentrations at the worst-case sensitive receptors using generic meteorological data. The DMRB model uses conservative emission factors, the formulae for which are outlined in the DMRB Volume 11 Section 3 Part 1 – HA 207/07 Annexes B3 and B4. These worst-case road contributions are then added to the existing background concentrations to give the worst-case predicted ambient

concentrations. The worst-case ambient concentrations are then compared with the relevant ambient air quality standards to assess the compliance of the proposed development with these ambient air quality standards, see Appendix 9.1. The Transport Infrastructure Ireland’s Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (Revision 1, 2011) detail a methodology for determining air quality impact significance criteria for road schemes and this can be applied to any project that causes a change in traffic flows. The degree of impact is determined based on both the absolute and relative impact of the proposed development.

The Transport Infrastructure Ireland’s significance criteria have been adopted for the proposed development. The significance criteria are based on PM₁₀ and NO₂ as these pollutants are most likely to exceed the annual mean limit values (40 µg/m³). However, the criteria have also been applied to the predicted 8-hour CO, annual benzene and annual PM_{2.5} concentrations for the purposes of this assessment.

Transport Infrastructure Ireland (TII) Guidelines

Construction Phase

As stated in the TII Guidance it is “*very difficult to accurately dust emissions arising from construction activities*”. “*A semi quantitative approach is recommended to determine the likelihood of a significant impact, which should be combined with an assessment of the proposed mitigation measures*”.

The semi-quantitative assessment outlined is used to assess the impact of the dust during the construction phase. TII guidance states that dust emissions from construction sites can lead to elevated PM₁₀ concentrations and can cause soiling of properties. The impact of dust emissions during the construction phase is assessed by estimating the area over which there is a risk of significant impacts, in line with the TII guidance. Emissions from construction vehicles are assessed where construction traffic results in a significant (>10%) increase in AADT flows near sensitive receptors in accordance with the TII guidance.

Significance criteria outlined in Tables 9.12 and 9.13 are used to assess the impact of the construction traffic on worst-case sensitive for receptors.

Operational Phase

The TII Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes specifies that the changes in pollutant concentrations alongside roads with a significant change in traffic should be assessed. It states that receptors should be considered at all road links where a greater than 5% change in flows or speeds is predicted for the "Do-Something" option.

Significance criteria have been adopted from the TII guidelines and these are presented in Appendix 9.2. The TII guidelines requires the consideration of NO_x and nitrogen deposition impacts at ecological sites that are located within 200m of the proposed development.

POLLUTANT	REGULATION	LIMIT CRITERIA	TOLERANCE ¹	LIMIT VALUE
NITROGEN DIOXIDE	2008/50/EC	Hourly limit for the protection of human health – not to be exceeded more than 18 times/year	40% until 2003 reducing linearly to 0% by 2010	200 µg/m ³
		Annual limit for the protection of	40% until 2003 reducing linearly to 0% by	40 µg/m ³

		human health Annual limit for the protection of vegetation	2010 None	400 µg/m ³ NO & NO ²
LEAD	2008/50/EC	Annual limit for the protection of human health	100%	0.5 µg/m ³
SULPHUR DIOXIDE	2008/50/EC	Hourly limit for protection of human health – not to be exceeded more than 24 times/year	150 µg/m ³	350 µg/m ³
		Daily limit for protection of human health – not to be exceeded more than 3 times/year	NONE	125 µg/m ³
		Annual and Winter limit for the protection of ecosystems	NONE	20 µg/m ³
PARTICULATE MATTER PM ₁₀	2008/50/EC	24-hour limit for protection of human health – not to be exceeded more than 35 times/year	50%	50 µg/m ³
			20%	40 µg/m ³
		Annual limit for the protection of human health		
PARTICULATE MATTER PM _{2.5} STAGE 1	2008/50/EC	Annual limit for the protection of human health	20% from June 2008. Decreasing linearly to 0% by 2015	25 µg/m ³
PARTICULATE MATTER PM _{2.5} STAGE 2	2008/50/EC	Annual limit for the protection of human health	NONE	20 µg/m ³
BENZENE	2008/50/EC	Annual limit for the protection of human health	20% until 2006. Decreasing linearly to 0% by 2010	5 µg/m ³
CARBON MONOXIDE	2008/50/EC	8-hour limit (on a rolling basis) for protection of human health	60%	10 mg/m ³

DUST DEPOSITION	German TA Luft Air Quality Standard ^{Note 1}	30 Day Average	NONE	350 mg/m ² /day
-----------------	---	----------------	------	----------------------------

Table 9-1 Air Quality Standards Regulations 2011 (based on EU Council Directive 2008/50/EC)

¹The 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.

Note 1: Dust levels in urban atmospheres can be influenced by industrial activities and transport sources. There are currently no national or European Union air quality standards with which these levels of dust deposition can be compared. However, a figure of 350 mg/m²-day (as measured using Bergerhoff type dust deposit gauges as per German Standard Method for determination of dust deposition rate, VDI 2129) is commonly applied to ensure that no nuisance effects will result from industrial or construction activities.

Construction Impact Assessment Criteria

Transport Infrastructure Ireland's 'Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes' (Revision 1, 2011) states that

"it is very difficult to accurately quantify dust emissions arising from construction activities" and that "it is thus not possible to easily predict changes to dust soiling rates or PM₁₀ concentrations."

The guidance advises the use of a semi-quantitative approach to determine the likelihood of a significant impact which should be combined with an assessment of the proposed mitigation measures.

The impact of construction related dust emissions is assessed by estimating the area over which there is a risk of significant impacts as per the NRA guidance. The construction assessment criteria, reproduced from the NRA guidance, are set out in Appendix 9.3 below.

Operational Impact Assessment Criteria

Once operational the proposed development may impact on air quality as a result of the requirements of new buildings to be heated and with the increased traffic movements associated with the development.

Air quality significance criteria are assessed on the basis of compliance with the national air quality limit values. The Air Quality Standards Regulations 2011 replace the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999.

Climate Assessment Methodology

Climate has implications for many aspects of the environment from soils to biodiversity and land use practices. The proposed development may impact on both the macro-climate and micro-climate. The macro-climate is the climate of a large geographic area such as Ireland. The micro-climate refers to the climate in the immediate area. With respect to microclimate, green areas are considered to be sensitive to development. Development of any green area is generally associated with a reduction in the abundance of vegetation including trees and a reduction in the amount of open, undeveloped space. The removal of vegetation or the development of man-made structures in these areas can intensify the temperature gradient.

To assess the impacts of converting vegetative surfaces to hard-standing with residential buildings and its significance, the amount of vegetative surfaces associated with the proposed development that will be converted to residential buildings and hard-standing has been considered.

The impact of the proposed scheme upon the macro-climate is assessed through the consideration of the change in CO₂ emissions that will occur due to the changes in traffic flow that occur in response to the proposed scheme. Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) in April 1994 and the Kyoto Protocol

in 1997 (FCCC 1997, 1999). For the purposes of the EU burden sharing agreement under Article 4 of the Kyoto Protocol, Ireland agreed to limit the net anthropogenic growth of the six GHGs under the Kyoto Protocol to 13% above the 1990 level over the period 2008 to 2012 (ERM 1998). 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 (COP24) to the agreement was convened in Katowice, Poland December 2018. COP24 was viewed as an important step towards the new 2015 agreement on climate change which was signed in Paris in late 2015. 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 adaptation onto the same level as action to cut and curb emissions.

The EU, on the 23/24th of October 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.

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 (SO₂), Nitrogen Oxides (NO_x), Volatile Organic Compounds (VOCs) and Ammonia (NH₃). To achieve the initial targets Ireland was obliged, by 2010, to meet national emission ceilings of 42 kt for SO₂ (67% below 2001 levels), 65 kt for NO_x (52% reduction), 55 kt for VOCs (37% reduction) and 116 kt for NH₃ (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}. In relation to Ireland, 2020 emission targets are 25 kt for SO₂ (65% below 2005 levels), 65 kt for NO_x (49% reduction), 43 kt for VOCs (25% reduction), 108 kt for NH₃ (1% reduction) and 10 kt for PM_{2.5} (18% reduction). COM (2013) 917 Final is the “Proposal for a Council Decision for the acceptance of the Amendment to the 1999 Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution to Abate Acidification, Eutrophication and Ground level Ozone”.

European Commission Directive 2001/81/EC, the National Emissions Ceiling Directive (NECD), prescribes the same emission limits as the 1999 Gothenburg Protocol. A National Programme for the progressive reduction of emissions of these four transboundary pollutants has been in place since April 2005 (DEHLG 2004, 2007). The most recent data available from the EU in 2010 indicated that Ireland complied with the emissions ceilings for SO₂, VOCs and NH₃ but failed to comply with the ceiling for NO_x (EEA 2011). COM (2013) 920 Final is the “Proposal for a Directive on the reduction of national emissions of certain atmospheric pollutants and amending Directive 2003/35/EC”. The proposal will apply the 2010 NECD limits until 2020 and establish new national emission reduction commitments which will be applicable from 2020 and 2030 for SO₂, NO_x, NMVOC, NH₃, PM_{2.5} and CH₄. In relation to Ireland, 2020-29 emission targets are for SO₂ (65% below 2005 levels), for NO_x (49% reduction), for VOCs (25% reduction), for NH₃ (1% reduction) and for PM_{2.5} (18% reduction). In relation to 2030, Ireland’s emission targets are for SO₂ (83% below 2005 levels), for NO_x (75% reduction), for VOCs (32% reduction), for NH₃ (7% reduction), for PM_{2.5} (35% reduction) and for CH₄ (7% reduction).

Guidance issued by the European Commission in 2013 entitled *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* has been applied to this assessment in order to determine the potential impacts the proposed developments may have a climate change and biodiversity.

9.3 RECEIVING ENVIRONMENT

Description of the Baseline Environment/Context

The site is bounded to the west by N1 road. To the north by Whitehall GAA Pitch. To the east by an apartment block and to the south by Highfield Healthcare Centre.

The site is not located within a Conservation Area or an Architectural Conservation Area. The topography of the site is generally flat. The development area is located within a zone which includes a number of sources of transportation related air emissions principally, Dublin bus routes 1, 16, 33, 41, 41b, 41c and 44 serve the site along N1 Road. The site is 2.1km from Drumcondra train station.

Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM₁₀, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than PM_{2.5}) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles (PM_{2.5} - PM₁₀) will increase at higher wind speeds. Thus, measured levels of PM₁₀ will be a non-linear function of wind speed.

Description of Existing Climate

The nearest representative synoptic meteorological station to the subject site is at Dublin Airport which is located approximately 5.3km northwest of the site and as such, long-term measurements of wind speed/direction and air temperature for this location are representative of prevailing conditions experienced at the subject site. Recent meteorological data sets for Dublin Airport were obtained from Met Éireann for the purposes of this assessment study.

Rainfall

Precipitation data from the Dublin Airport meteorological station for the period 2018-2020 indicates a mean annual total of about 781.43mm. This is within the expected range for most of the eastern half of the Ireland which has between 750mm and 1000 mm of rainfall in the year.

Temperature

The annual mean temperature at Dublin Airport (2011-2020) is 9.63°C. Given the relatively proximity of this meteorological station to the proposed development site, similar conditions would be observed. Table 9.2 sets out meteorological data for Dublin Airport from 2018-2020.

Year	Period	Rainfall (mm)	Mean Temperature (OC)
2018	Annual Mean	709.4	9.7
2019	Annual Mean	886.1	9.6
2020	Annual Mean	748.8	9.6
Mean		781.43	9.63

Table 9-2 Meteorological Data for Dublin Airport 2018-2020

Wind

Wind is of key importance for both the generation and dispersal of air pollutants. The nearest representative weather station collating detailed weather records is Dublin Airport. The Meteorological from Dublin Airport indicates that the

prevailing wind direction, in the Dublin area, is from the West and Southwest and blows Northwest across the proposed development. The mean annual wind speed in the Dublin area between 2009 - 2017 is 5.7 m/s.

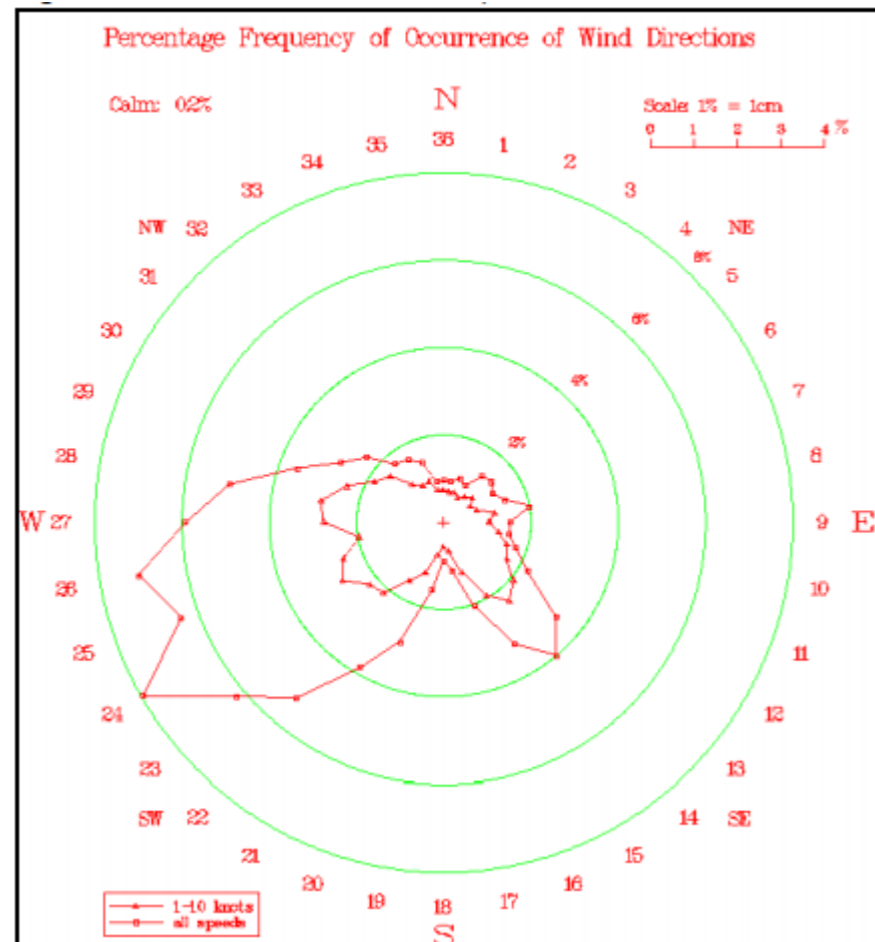


Figure 9-1 Dublin Airport Windrose 2009-2017

Description of Existing Air Quality

The existing ambient air quality at and in the vicinity of the site is typical of a intermediate Urban location and as such, domestic and commercial heating sources and road traffic are identified as the dominant contributors of hydrocarbon, combustion gases and particulate emissions to ambient air quality.

Available climate & air quality characters for neighbouring EIAR sites have been reviewed in preparing this EIAR. These characters have shown that the neighbouring development have a long-term and imperceptible impact at all of the receptors.

Trends in Air Quality

Trends in Annual air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality “Air Quality in Ireland 2020– Key Indicators of Ambient Air Quality” details the range and scope of monitoring undertaken throughout Ireland with Dublin 9 categorised as Zone A.

The most recent 2020 EPA publication includes a number of Zone A monitoring locations which would be broadly comparable to the expected air quality at the subject site. The various Zone A air quality monitoring stations within Ireland provide a comprehensive range of air quality monitoring data sets which have been selected as part of this assessment to describe the existing ambient air quality at the subject site.

Baseline Air Quality – Review of Available Background Data

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality in Ireland is “Air Quality in Ireland 2020 – Indicators of Air Quality” (EPA, 2021). 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, 2021).

In terms of air monitoring and assessment, the proposed development site is within Zone A. The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.)

The most recent EPA publication includes a number of monitoring locations in Dublin City which would be broadly comparable to the expected air quality at the subject site. The various air quality monitoring stations within the Dublin area provides a comprehensive range of air quality monitoring data sets which have been selected as part of this assessment to describe the existing ambient air quality at the subject site.

Nitrogen Dioxide (NO₂)

With regard to NO₂, continuous monitoring data from the EPA at the Zone A locations of Ringsend, Swords, Ballyfermot, Dun Laoghaire, Rathmines, Coleraine St, Winetavern St, David Road, DAA , Dublin Port, Tallaght, Blanchardstown, St. Johns Road and Pearse St. The average results at all location has been used in the DMRB screening model. Long-term data for the period 2014 – 2020 show annual mean concentrations range from 13.0 – 49 µg/m³; showing an average over the seven year period of no more than 21.68µg/m³. Based on these results from 2014 - 2020 a current maximum daily 1-hr mean of 146.21µg/m³ has been used in the DMRB screening model.

Air Quality Zone A		Nitrogen Dioxide (NO ₂)						
Station	Averaging Period	Year						
		2014	2015	2016	2017	2018	2019	2020
Ringsend	Annual Mean NO ₂ (µg/m ³)	-	-	-	21.9	27	24	18
	Max 1-hr NO ₂ (µg/m ³)	-	-	-	137.7	121	109	123.8
Swords	Annual Mean NO ₂ (µg/m ³)	14.0	13.0	15.7	14.2	16	15	11
	Max 1-hr NO ₂ (µg/m ³)	325.0	170.0	205.9	107.3	112	108	83.7
Ballyfermot	Annual Mean NO ₂ (µg/m ³)	16.0	16.0	17.3	16.5	17	20	12
	Max 1-hr NO ₂ (µg/m ³)	128.0	142.0	127.3	148.2	217	124	107.7
Dun Laoghaire	Annual Mean NO ₂ (µg/m ³)	15.0	16.0	18.6	17.4	19	15	14
	Max 1-hr NO ₂ (µg/m ³)	105.0	103.0	141.7	153.3	135	104	92.1
Rathmines	Annual Mean NO ₂ (µg/m ³)	17.0	18.0	20.0	17.1	20	22	13
	Max 1-hr NO ₂ (µg/m ³)	112.0	106.0	102.0	115.9	138	183	170
Coleraine St.	Annual Mean NO ₂ (µg/m ³)	25.0	25.0	27.6	25.6	-	-	-
	Max 1-hr NO ₂ (µg/m ³)	130.0	157.0	146.5	189.4	-	-	-
Winetavern St.	Annual Mean NO ₂ (µg/m ³)	31.0	31.0	36.6	27.2	29	28	15
	Max 1-hr NO ₂ (µg/m ³)	188.0	182.0	193.9	196.4	165	142	121.5
Davitt Road	Annual Mean NO ₂ (µg/m ³)	-	-	-	-	26	24	14
	Max 1-hr NO ₂ (µg/m ³)	-	-	-	-	120	127	108.3
DAA	Annual Mean NO ₂ (µg/m ³)	-	-	-	-	-	-	23

	Max 1-hr NO ₂ (µg/m ³)	-	-	-	-	-	-	88.8
Dublin Port	Annual Mean NO ₂ (µg/m ³)	-	-	-	-	-	-	23
	Max 1-hr NO ₂ (µg/m ³)	-	-	-	-	-	-	117.3
Tallaght	Annual Mean NO ₂ (µg/m ³)	-	-	-	-	-	-	14
	Max 1-hr NO ₂ (µg/m ³)	-	-	-	-	-	-	100.8
Blanchardstown	Annual Mean NO ₂ (µg/m ³)	31.0	25.0	30.2	26.2	25	31	12
	Max 1-hr NO ₂ (µg/m ³)	215.0	178.0	160.2	331.2	149	163	164.6
St. Johns Road	Annual Mean NO ₂ (µg/m ³)	-	-	-	-	-	43	30
	Max 1-hr NO ₂ (µg/m ³)	-	-	-	-	-	156	130
Pearse St.	Annual Mean NO ₂ (µg/m ³)	-	-	-	-	-	49	27
	Max 1-hr NO ₂ (µg/m ³)	-	-	-	-	-	151	142.3

Table 9-3 Trends in Zone A Air Quality - Nitrogen Dioxide (NO₂)

Particulate Matter (PM₁₀)

Results of Continuous PM₁₀ monitoring carried out at the locations of Ringsend, Tallaght, Blanchardstown, Ballyfermot, Dun Laoghaire, Rathmines, Winetavern St, Phoenix Park, St John’s Road, St. Anne’s Road, Davitt Roads, Finglas, Marino, Dublin Port and Dublin Airport with seven years of annual mean concentrations are shown in Table 9.4. Long-term data for the period 2014 – 2020 show concentrations of the annual mean ranges from 9.1 – 20 µg/m³; showing an average concentration over the seven year period of no more than 13.22µg/m³. The daily limit for the protection of human health is no more than 35 days>50µg/m³. Based on the EPA data (Table 9.4) a conservative estimate of the current background PM₁₀ concentration in the region of the proposed development is 13.22 µg/m³.

Air Quality Zone A		PM ₁₀						
Station	Averaging Period	Year (PM ₁₀)						
		2014	2015	2016	2017	2018	2019	2020
Ringsend	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	13.4	20	19	17
	Daily Max > 50 µg/m ³	-	-	-	2	3	12	67
Tallaght	Annual Mean PM ₁₀ (µg/m ³)	15.0	14.0	14.2	11.8	15	12	10
	Daily Max > 50 µg/m ³	2	4	0	2	1	3	41
Blanchardstown	Annual Mean PM ₁₀ (µg/m ³)	18.0	17.0	17.9	15.0	17	19	15
	Daily Max > 50 µg/m ³	5	9	2	3	2	11	62
Ballyfermot	Annual Mean PM ₁₀ (µg/m ³)	11	12.0	10.7	12	16	14	12
	Daily Max > 50 µg/m ³	2	3	0	1	0	7	63
Dun Laoghaire	Annual Mean PM ₁₀ (µg/m ³)	14	13.0	12.9	11.9	13	12	12
	Daily Max > 50 µg/m ³	2	3	0	2	0	2	46
Rathmines	Annual Mean PM ₁₀ (µg/m ³)	14	15.0	14.8	13.4	15	15	11
	Daily Max > 50 µg/m ³	3	5	3	5	2	9	73
Winetavern St.	Annual Mean PM ₁₀ (µg/m ³)	14	14.0	14.0	12.9	14	15	13
	Daily Max > 50 µg/m ³	1	4	2	3	1	9	49
Phoenix Park	Annual Mean PM ₁₀ (µg/m ³)	12	12.0	10.5	9.1	11	11	10
	Daily Max > 50 µg/m ³	0	2	0	1	0	2	41
St. John’s Road	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	14	14	13
	Daily Max > 50 µg/m ³	-	-	-	-	0	5	47
St. Anne’s Park	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	11	12	11
	Daily Max > 50 µg/m ³	-	-	-	-	0	1	40
Davitt Roads	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	14	19	15
	Daily Max > 50 µg/m ³	-	-	-	-	0	15	13

Finglas	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	11	13	12
	Daily Max > 50 µg/m ³	-	-	-	-	0	2	44
Marino	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	12	14	13
	Daily Max > 50 µg/m ³	-	-	-	-	0	4	48
Dublin Port	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	-	-	20
	Daily Max > 50 µg/m ³	-	-	-	-	-	-	77
Dublin Airport	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	-	-	13
	Daily Max > 50 µg/m ³	-	-	-	-	-	-	36

Table 9- 4 Trends in Zone A Air Quality – PM₁₀

Results of PM₁₀ monitoring was carried out on the proposed site using the DustTrak II Aerosol Monitor 8530. The locations of the monitoring is shown in figure 9.2 and the results are shown in table 9.5 below.



Figure 9-2 PM₁₀ Monitoring Locations

Location	PM ₁₀ (µg/m ³)
A1	5.60
A2	4.50
A3	5.00
A4	5.00
A5	5.25
A6	5.25
A7	5.00
A8	7.00
Average	5.33

Table 9-5 PM10 Monitoring Locations

Long-term data for the period 2014 – 2020 shows an average concentration over the seven year period of no more than 13.22µg/m³. The average PM₁₀ monitoring on site is 5.33µg/m³. The long – term data and the on site data has been added together and the average figure of 9.28µg/m³ has been used in the DMRB screening model.

Nitrogen Oxide (NO_x)

With regard to NO_x, continuous monitoring data from the EPA at the Zone A locations of Ringsend, Swords, Blanchardstown, Ballyfermot, Dun Laoghaire, Rathmines, Coleraine St, St. John Road, Davitt Road, Pearse St.,Dublin Port, Tallaght, DAA and Winetavern St. The average long-term concentrations range from 22 – 161.40 µg/m³ for the period 2014 – 2020. Based on these results a conservative estimate of the current background NO_x concentration in the region of the proposed development is 42.21 µg/m³.

Air Quality Zone A		Nitrogen oxide (NO _x)						
Station	Averaging Period	Year (NO _x)						
		2014	2015	2016	2017	2018	2019	2020
Ringsend	Annual Mean NO _x (µg/m ³)	-	-	-	54.3	50	45.0	32.4
	Hourly Max ¹	-	-	-	986.1	909	687.0	835.8
Swords	Annual Mean NO _x (µg/m ³)	24	22	24.5	22.2	23	20.9	15.5
	Hourly Max ¹	7022	833	1173.4	653.8	735	593.6	504.8
Blanchardstown	Annual Mean NO _x (µg/m ³)	67	55	76.4	57.8	62	69.9	62.4
	Hourly Max ¹	1440	962	953.2	1441.5	1032	1097.7	1405.4
Ballyfermot	Annual Mean NO _x (µg/m ³)	25	23	25.6	20.7	25	28.1	17.1
	Hourly Max ¹	839	553	705.2	789.4	704	708.5	930.2
Dun Laoghaire	Annual Mean NO _x (µg/m ³)	22	27	29.1	27.4	30	26.6	21.7
	Hourly Max ¹	416	915	570.9	796.4	614	503.7	462
Rathmines	Annual Mean NO _x (µg/m ³)	27	28	31.1	26.8	33	34.3	21.4
	Hourly Max ¹	750	593	558.1	946.2	681	1087.2	794.6
Coleraine St.	Annual Mean NO _x (µg/m ³)	41	44	49.5	46.2	-	-	-
	Hourly Max ¹	720	962	1008.2	1530.9	-	-	-
Winetavern St.	Annual Mean NO _x (µg/m ³)	59	49	63.4	45.6	47	45.8	25.8
	Hourly Max ¹	1236	982	1222.1	1427.7	1144	833.6	883.0
St. Johns Road	Annual Mean NO _x (µg/m ³)	-	-	-	-	-	121.9	82
	Hourly Max ¹	-	-	-	-	-	1235.3	1153.1
Davitt Road	Annual Mean NO _x (µg/m ³)	-	-	-	-	-	46.1	27.5
	Hourly Max ¹	-	-	-	-	-	866.1	800.9

Pearse St.	Annual Mean NO _x (µg/m ³)	-	-	-	-	-	161.4	78.7
	Hourly Max ¹	-	-	-	-	-	886.4	1053.6
Dublin Port	Annual Mean NO _x (µg/m ³)	-	-	-	-	-	-	58
	Hourly Max ¹	-	-	-	-	-	-	641.6
Tallaght	Annual Mean NO _x (µg/m ³)	-	-	-	-	-	-	27.3
	Hourly Max ¹	-	-	-	-	-	-	437.0
DAA	Annual Mean NO _x (µg/m ³)	-	-	-	-	-	-	37.5
	Hourly Max ¹	-	-	-	-	-	-	327.4

Note¹ NO_x is expressed as µg/m³.

Note² NO_x annual mean limit value for the protection of Vegetation: 30 µg/m³ (Limit only applies to rural stations in Zone D)

Table 9-6 Trends in Zone A Air Quality - Nitrogen oxide (NO_x)

Particulate Matter (PM_{2.5})

Continuous PM_{2.5} monitoring was carried out by the EPA at the Zone A locations of Marino, Finglas, Rathmines, Coleraine, Ballyfermot, Phoenix Park, Davitt Road, St. Johns Road, St. Annes Park, Ringsend, Blanchardstown, Tallaght, Pearse Street, Dublin Airport, Dublin Port and Dun Laoghaire showed annual mean levels of 6 - 11 µg/m³ over the period 2014 - 2020. Based on this EPA data shown in table 9.7, an average background PM_{2.5} concentration in the region of the proposed development is 8.13 µg/m³. There were no exceedances of limit of 25 µg/m³ in annual mean.

Air Quality Zone A		PM _{2.5}						
Station	Averaging Period	Year (PM _{2.5})						
		2014	2015	2016	2017	2018	2019	2020
Marino	Annual Mean PM ₁₀ (µg/m ³)	8	8	7	6.9	6	9	8
	Daily Max	50	84	111.3	71.3	30	66	39
Finglas	Annual Mean PM ₁₀ (µg/m ³)	7	8	8.5	6.6	8	9	7
	Daily Max	35	75	111.3	51.9	97	59	36
Rathmines	Annual Mean PM ₁₀ (µg/m ³)	9	10	10	8.5	9	8	8
	Daily Max	49	85	53.3	95.7	70	68	67
Coleraine	Annual Mean PM ₁₀ (µg/m ³)	9	9	9	8	-	-	-
	Daily Max	43	82	46.4	81.5	-	-	-
Ballyfermot	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	7	10	8
	Daily Max	-	-	-	-	41	66	58
Phoenix Park	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	6	8	7
	Daily Max	-	-	-	-	27	58	35
Davitt Road	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	8	11	9
	Daily Max	-	-	-	-	60	68	59
St. Johns Road	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	9	9	7
	Daily Max	-	-	-	-	40	60	43
St. Annes Park	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	7	8	7
	Daily Max	-	-	-	-	23	61	43
Ringsend	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	8	10	8
	Daily Max	-	-	-	-	49	73	67
Dun Laoghaire	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	-	10	8
	Daily Max	-	-	-	-	-	32	40
Blanchardstown	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	-	-	7
	Daily Max	-	-	-	-	-	-	28

Tallaght	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	-	-	7
	Daily Max	-	-	-	-	-	-	34
Pearse Street	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	-	--	8
	Daily Max	-	-	-	-	-	-	44
Dublin Airport	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	-	-	6
	Daily Max	-	-	-	-	-	-	20
Dublin Port	Annual Mean PM ₁₀ (µg/m ³)	-	-	-	-	-	-	9
	Daily Max	-	-	-	-	-	-	69

Note 1 PM_{2.5} annual mean limit value for the protection of human health: 25 µg/m³

Table 9-7 Trends in Zone A Air Quality - (PM 2.5)

Results of PM_{2.5} monitoring was carried out on the proposed site using the DustTrak II Aerosol Monitor 8530. The locations of the monitoring is shown in figure 9.3 and the results are shown in table 9.8 below.



Figure 9-3 PM_{2.5} Monitoring Locations

Location	PM ₁₀ (µg/m ³)
B1	5.30
B2	4.50

B3	4.50
B4	4.50
B5	5.00
B6	5.00
B7	5.00
B8	6.00
Average	4.98

Table 9-8 PM_{2.5} Monitoring Locations

EPA data shown in table 9.7, an average background PM_{2.5} concentration in the region of the proposed development is 8.13 µg/m³. The average PM₁₀ monitoring on site is 4.98µg/m³. The EPA data and the on site data has been added together and the average figure of 6.56µg/m³ has been use in the region of the development.

Benzene

In terms of benzene, the annual mean concentration in the Zone A monitoring location of Rathmines from 2014 - 2020 was 0.70 µg/m³. This is well below the limit value of 5 µg/m³. Between 2014 - 2020 annual mean concentrations at Zone A sites ranged from 0.26 – 1.01 µg/m³. Based on this EPA data a conservative estimate of the current background benzene concentration in the region of the proposed development is 0.70 µg/m³

Air Quality Zone A		Benzene						
Station	Averaging Period	Year						
		2014	2015	2016	2017	2018	2019	2020
Rathmines	Annual Mean Benzene(µg/m ³)	0.94	0.92	1.01	0.92	0.30	0.26	0.52
	Daily Max	4.70	7.89	1.94	4.60	4.40	4.26	6.23

Table 9-9 Trends in Zone A Air Quality - Benzene

Carbon Monoxide (CO)

With regard to CO, annual averages at the Zone A locations of Coleraine Street, Winetavern Street, Balbriggan and DAA over the 2014 – 2020 period are low, ranging from 0 to 0.5 µg/m³ based on this EPA data, a conservative estimate of the current background CO concentration in the region of the proposed development is 0.27 mg/m³. The maximum daily 8-hr mean of 2.54mg/m³ has been used in the DMRB screening model.

Air Quality Zone A		Carbon Monoxide(CO)						
Station	Averaging Period	Year (CO)						
		2014	2015	2016	2017	2018	2019	2020
Coleraine Street	Annual Mean PM ₁₀ (mg/m ³)	0.4	0.4	0.5	0.43	-	-	-
	Max ¹	2.5	3	2.3	2.9	-	-	-
Winetavern Street	Annual Mean PM ₁₀ (mg/m ³)	0	0	0.1	0.14	0.2	0.3	0.3
	Max ¹	2.4	2	1.9	2.3	1.8	2.7	3.6
Balbriggan	Annual Mean PM ₁₀ (mg/m ³)	0.5	-	-	-	-	-	-
	Max ¹	1.9	-	-	-	-	-	-
DAA	Annual Mean PM ₁₀ (mg/m ³)	-	-	-	-	-	-	0.3
	Max ¹	-	-	-	-	-	-	3.7

Note 1 maximum daily 8-hr mean limit value for protection of human health of 10 mg/m³

Table 9-10 Trends in Zone A Air Quality - Carbon Monoxide (CO)

Background concentrations for 2026 and 2041 have been calculated. These have used the predicted current background concentrations and the year on year reduction factors provided by Transport Infrastructure Ireland in the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes and the UK Department for Environment, Food and Rural Affairs LAQM.TG.

9.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Proposed development will consist of the construction of 7 no. blocks in heights up to 8 storeys (over single level basement) comprising 472 no. apartment units, a creche, café unit, and internal residential amenity space. The proposal also includes car, cycle, and motorcycle parking, public and communal open spaces, landscaping, bin stores, plant areas, substations, switch rooms, and all associated site development works and services provision. A full description of the development is provided in the statutory notices and in Chapter 3 of the EIAR submitted with the application.

When considering a development of this nature, the potential air quality and climate impact on the surroundings must be considered for each of two distinct stages:

- A. – Construction phase ;
- B. - Operational phase.

During the construction stage (which will include the main source of air quality impacts will be as a result of fugitive dust emissions from site activities. Emissions from construction vehicles and machinery have the potential to impact climate. The primary sources of air and climatic emissions in the operational context are deemed long term and will involve the change in traffic flows or congestion in the local areas which are associated with the development.

The following describes the primary sources of potential air quality and climate impacts which have been assessed as part of this EIAR.

9.5 POTENTIAL IMPACTS

Construction Impacts

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 PM₁₀/PM_{2.5} emissions. The proposed development can be considered moderate in scale and therefore there is the potential for significant dust soiling 50m from the source (Table 9.11). While construction dust tends to be deposited within 200m of a construction site, the majority of the deposition occurs within the first 50m.

Potential impacted in the absence of mitigation could cause:

- Potential for loss of life or injury to employees, Contractors, visitors and local residents
- Potential for damage to the environment
- Potential for damage to the facilities, plant and equipment
- Mobilised suspended sediment and cement release through construction activities are the principal potential sources of water quality impact during the construction phase of the works.

Source		Potential Distance for Significant Effects (Distance from Source)		
Scale	Description	Soiling	PM ₁₀	Vegetation Effects

Major	Large construction sites, with high use of haul roads	100m	25m	25m
Moderate	Moderate sized construction sites, with moderate use of haul roads	50m	15m	15m
Minor	Minor construction sites, with limited use of haul roads	25m	10m	10m

Table 9-11 Assessment Criteria for the Impact of Dust from Construction, with Standard Mitigation in Place

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 CO₂ and NO₂ emissions. However, due to short-term and temporary nature of these works, the impact causes noticeable changes in the character of the environment but without significant consequences.

Human Health

Potential impacts to human health in the absence of any mitigation are listed below

- **Asthma attacks:** Breathing ozone and particle pollution can lead to increased asthma attacks, which can result in visits to the emergency room and hospital admissions, not to mention missed work and school.
- **Cardiovascular disease:** Air pollution can increase the risk of both heart attacks and stroke.
- **Developmental damage:** Exposure to air pollution can slow and stunt lung development in growing children, harming their health now and reducing their lung function as adults.
- **Susceptibility to infections:** Air pollution increases the risk of lung infections, especially in children.
- **Worsened COPD symptoms:** Exposure to air pollution can make it even harder for people with chronic obstructive pulmonary disease (COPD) to breathe.
- **Lung irritation:** Even people with healthy lungs are susceptible to irritation and swelling. For those living with chronic lung diseases, such as asthma and COPD, these effects can be especially harmful.
- **Wheezing, coughing and shortness of breath:** Like many of the other conditions in this list, these can be caused by both long-term exposure and short-term exposure to high levels of air pollutants.

Operational Phase

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 NO₂, CO, benzene and PM₁₀.

Annual Average Daily Traffic Flow (AADT) information was obtained from Aecom on this project and has been used to model pollutant levels under various traffic scenarios and under sufficient spatial resolution to assess whether any significant air quality impact on sensitive receptors may occur. Cumulative effects have been assessed, as required by the EU Directive on EIA (Council Directive 2014/52/EU).

There are one proposed or permitted development in the wider area surrounding the proposed development under assessment. This is as follow:

- Whitehall Colmcille GAA, Collins Avenue, Whitehall, Dublin 9 to the east of the site

The operational phase of the developments listed above, have the potential to generate cumulative impacts on the climate & air quality in the local area. These developments have been taken into account in the DMRB assessment. The cumulative impact of the proposed development in combination with the surrounding developments has been determined to be imperceptible and long term following the DMRB assessment.

Background concentrations have been included in the modelling study. These background concentrations are year-specific and account for non-localised sources of the pollutants of concern. Appropriate background levels were selected based on the available monitoring data provided by the EPA.

The impact of the proposed development has been assessed by modelling emissions from the traffic generated as a result of the development. The impact of CO, benzene, NO₂, NO_x and PM₁₀ for the years 2026 and 2041 was predicted at the nearby sensitive receptors to the development. This assessment allows the significance of the development, with respect to both relative and absolute impact, to be determined.

The receptors modelled represent the worst-case locations close to the proposed development and were chosen due to their close proximity (within 200 m) to the road links impacted by proposed development. The worst-case traffic data which satisfied the assessment criteria detailed in Section 9.2 is shown in Table 9.12 which has a 20% HGV flow. 13 receptors have been identified in the vicinity of the proposed development. Sensitive receptors have been chosen as they have the potential to be adversely impacted by the development, these receptors are shown in Table 9.13 and Figure 9.5.



Figure 9-4 Link Roads

Link Number	Speed (kph)	Base Year	Do-Nothing		Do-Something	
		2019	2026	2041	2026	2041
P1	50	33825	37853	42131	38513	42791
P2	50	22753	25462	28340	26122	29000
P3	50	22947	25679	28582	26339	29242

Table 9-12 AADD - Traffic Data used in Air Modelling Assessment

Name	Receptor Type	Coordinates	
		Eastings	Northings
R1	Residential	316847	238437
R2	Residential	316961	238430
R3	Residential	316809	238278

R4	Residential	316740	238107
R5	Educational	316652	238007
R6	Health Care	316805	237975

Table 9-13 Description of Sensitive Receptors



Figure 9-5 Approximate Sensitive Receptor Locations used in Modelling Assessment

Modelling Assessment

Transport Infrastructure Ireland Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes detail a methodology for determining air quality impact significance criteria for road schemes and has been adopted for this assessment, as is best practice. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the ‘Do-Nothing’ scenario, which assumes that the proposed development is not in place in future years, in order to determine the degree of impact.

NO₂

The results of the DMRB modelled impact of the proposed development for NO₂ in 2026 and 2041 are shown in Table 9.14 – 9.15. The annual average concentration is within the limit value at all worst-case receptors. Levels of NO₂ range between 56.475% - 69.275% in 2026 and 56.550% - 69.850% in 2041 of the annual limit value using the annual mean concentrations for the EPA. The hourly limit value for NO₂ is 200 µg/m³ and is expressed as a 99.8th percentile (i.e. it

must not be exceeded more than 18 times per year). The daily maximum 1-hour NO₂ concentration is not predicted to be exceeded in 2026 or 2041. There are some increases in traffic flows between 2026 and 2041, therefore any reduction in concentrations is due to reduced background concentrations and greater efficiencies predicted in engines.

The impact of the proposed development on annual mean NO₂ levels can be assessed relative to “Do Nothing (DN)” levels in 2026 and 2041. Relative to baseline levels, some imperceptible increases in pollutant levels are predicted as a result of the proposed development. With regard to impacts at individual receptors, the greatest impact on NO₂ concentrations will be an increase of 0.125% of the annual limit value at Receptors 3 & 4. Thus, using the assessment criteria outlined in Appendix 9.2 Tables A1 – A2, the impact of the proposed development in terms of NO₂ is negligible. Therefore, the overall impact of NO₂ concentrations as a result of the proposed development is long-term and imperceptible at all of the receptors assessed.

PM₁₀

The results of the modelled impact of the proposed development for PM₁₀ in 2026 and 2041 are shown in Table 9.16. Predicted annual average concentrations at all receptors in the region of the development range between 23.800% - 27.675% in 2026 of the limit value. Future trends with the proposed development in place indicate similarly low levels of PM₁₀. PM₁₀ concentrations in 2041 range between 23.825% - 27.850% of the limit value.

The impact of the proposed development can be assessed relative to “Do Nothing” levels in 2026 and 2041. Relative to baseline levels, some imperceptible increases in pollutant levels are predicted as a result of the proposed development. With regard to impacts at individual receptors, the greatest impact on PM₁₀ concentrations will be an increase of 0.050% of the annual limit value at a number of Receptors . Thus, the magnitude of the changes in air quality are negligible at all receptors based on the criteria outlined in Appendix 9.2, Tables A1 – A3. Therefore, the overall impact of PM₁₀ concentrations as a result of the proposed development is long-term and imperceptible.

NO_x

The results of the modelled impact of the proposed development for NO_x in 2026 and 2041 are shown in Table 9.18 There is no limit valve assigned to Zone A.

The impact of the proposed development on annual mean NO_x levels can be assessed relative to “Do Nothing (DN)” levels in 2026 and 2041. Relative to baseline levels, some imperceptible increases in pollutant levels are predicted as a result of the proposed development. Thus, using the assessment criteria for NO₂ and PM₁₀ outlined in Appendix 9.2 and applying these criteria to NO_x, the impact of the proposed development in terms of NO_x is negligible, long-term and imperceptible.

PM_{2.5}

The Air Quality Standards Regulations 2011 specify a PM_{2.5} target value of 25 µg/m³ over a calendar year to be met by 1 January 2015. Long term PM_{2.5} monitoring was carried out in Zone A locations. Based on this EPA data and onsite monitoring, an average background PM_{2.5} concentration in the region of the proposed development is 6.56 µg/m³. Therefore, long term averages were below the target value 25 µg/m³.

The impact of the proposed development can be assessed relative to the PM_{2.5} trends in the Zone A area. Thus, the impact of the proposed development in terms of PM_{2.5} is negligible, long-term and imperceptible.

CO and Benzene

The results of the modelled impact of CO and benzene in the development for 2026 and 2041 are shown in Table 9.19 and Table 9.20 respectively. Predicted pollutant concentrations with the proposed development in place are below the ambient standards at all locations. Levels of CO range between 25.500% – 26.200% in 2026 and 25.500% –

26.300% in 2041 of the limit value. Levels of benzene ranging between 14.40% – 16.80% in 2026 and 14.40% – 17.20% in 2041 of the total limit value. Future trends indicate similarly low levels of CO and benzene. Levels of both pollutants are below their respective limit values, with CO reaching 16.80% of the limit and benzene reaching 17.20% in 2041.

The impact of the proposed development can be assessed relative to “Do Nothing” levels in 2026 and 2041. CO and benzene concentration from the DMRB Model in both 2026 and 2041 are predicted to increase marginally. Thus, using the assessment criteria for NO₂ and PM₁₀ outlined in Appendix 9.2 and applying these criteria to CO and benzene, the impact of the proposed development in terms of CO and benzene is negligible, long-term and imperceptible.

Receptor	Impact Opening Year (2026)					Impact Design Year (2041)				
	DN	DS	DS-DN	Magnitude	Description	DN	DS	DS-DN	Magnitude	Description
1	27.67	27.71	0.04	Imperceptible	Negligible Increase	27.90	27.94	0.04	Imperceptible	Negligible Increase
2	23.35	23.36	0.01	Imperceptible	Negligible Increase	23.42	23.43	0.01	Imperceptible	Negligible Increase
3	27.00	27.05	0.05	Imperceptible	Negligible Increase	27.21	27.26	0.05	Imperceptible	Negligible Increase
4	27.15	27.20	0.05	Imperceptible	Negligible Increase	27.36	27.41	0.05	Imperceptible	Negligible Increase
5	23.71	23.73	0.02	Imperceptible	Negligible Increase	23.79	23.81	0.02	Imperceptible	Negligible Increase
6	22.58	22.59	0.01	Imperceptible	Negligible Increase	22.62	22.62	0.00	Imperceptible	Negligible Increase

Table 9-14 Annual Mean NO₂ Concentrations (µg/m³)

Receptor	Daily Maximum 1-hour for NO ₂ concentrations (µg/m ³)					
	Impact Opening Year (2026)			Impact Design Year (2041)		
	DN	DS	DS-DN	DN	DS	DS-DN
1	153.88	153.92	0.04	154.14	154.18	0.04
2	148.76	148.77	0.01	148.85	148.86	0.01
3	153.13	153.19	0.06	153.37	153.42	0.05
4	153.30	153.35	0.05	153.54	153.59	0.05
5	149.22	149.25	0.03	149.33	149.35	0.02
6	147.70	147.72	0.02	147.76	147.77	0.01

Table 9-15 Daily maximum 1-hour for NO₂ concentrations (µg/m³)

Receptor	Impact Opening Year (2026)					Impact Design Year (2041)				
	DN	DS	DS-DN	Magnitude	Description	DN	DS	DS-DN	Magnitude	Description
1	11.05	11.07	0.02	Imperceptible	Negligible	11.13	11.14	0.01	Imperceptible	Negligible Increase
2	9.73	9.74	0.01	Imperceptible	Negligible Increase	9.75	9.76	0.01	Imperceptible	Negligible Increase
3	10.84	10.85	0.01	Imperceptible	Negligible Increase	10.90	10.92	0.02	Imperceptible	Negligible Increase
4	10.88	10.90	0.02	Imperceptible	Negligible	10.95	10.97	0.02	Imperceptible	Negligible Increase
5	9.83	9.84	0.01	Imperceptible	Negligible	9.86	9.86	0.00	Imperceptible	Negligible Increase

6	9.52	9.52	0.00	Imperceptible	Negligible	9.53	9.53	0.00	Imperceptible	Negligible Increase
---	------	------	------	---------------	------------	------	------	------	---------------	---------------------

Table 9-16 Annual Mean PM₁₀ Concentrations (µg/m³)

Receptor	Impact Opening Year (2026)		Impact Design Year (2041)	
	DN	DS	DN	DS
1	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00

Table 9-17 Number of days with PM₁₀ concentration > 50 µg/m³

Receptor	Impact Opening Year (2026)					Impact Design Year (2041)				
	DN	DS	DS-DN	Magnitude	Description	DN	DS	DS-DN	Magnitude	Description
1	66.91	67.08	0.17	Imperceptible	Negligible Increase	67.99	68.15	0.16	Imperceptible	Negligible Increase
2	48.52	48.56	0.04	Imperceptible	Negligible Increase	48.80	48.84	0.04	Imperceptible	Negligible Increase
3	63.89	64.11	0.22	Imperceptible	Negligible Increase	64.83	65.04	0.21	Imperceptible	Negligible Increase
4	64.54	64.76	0.22	Imperceptible	Negligible Increase	65.51	65.72	0.21	Imperceptible	Negligible Increase
5	49.94	50.02	0.08	Imperceptible	Negligible Increase	50.27	50.35	0.08	Imperceptible	Negligible Increase
6	45.55	45.59	0.04	Imperceptible	Negligible Increase	45.70	45.73	0.03	Imperceptible	Negligible Increase

Table 9-18 Annual Mean NO_x Concentrations (µg/m³)

Receptor	Impact Opening Year (2026)					Impact Design Year (2041)				
	DN	DS	DS-DN	Magnitude	Description	DN	DS	DS-DN	Magnitude	Description
1	0.84	0.84	0.00	Imperceptible	Negligible	0.86	0.86	0.00	Imperceptible	Negligible
2	0.74	0.74	0.00	Imperceptible	Negligible	0.74	0.74	0.00	Imperceptible	Negligible
3	0.80	0.80	0.00	Imperceptible	Negligible	0.81	0.81	0.00	Imperceptible	Negligible
4	0.80	0.80	0.00	Imperceptible	Negligible	0.81	0.81	0.00	Imperceptible	Negligible
5	0.73	0.74	0.01	Imperceptible	Negligible	0.74	0.74	0.00	Imperceptible	Negligible
6	0.72	0.72	0.00	Imperceptible	Negligible	0.72	0.72	0.00	Imperceptible	Negligible

Table 9-19 Annual Mean Benzene Concentrations (µg/m³)

Receptor	Impact Opening Year (2026)					Impact Design Year (2041)				
	DN	DS	DS-DN	Magnitude	Description	DN	DS	DS-DN	Magnitude	Description
1	2.62	2.62	0.00	Imperceptible	Negligible	2.63	2.63	0.00	Imperceptible	Negligible

2	2.56	2.56	0.00	Imperceptible	Negligible	2.56	2.56	0.00	Imperceptible	Negligible
3	2.61	2.61	0.00	Imperceptible	Negligible	2.61	2.62	0.01	Imperceptible	Negligible
4	2.61	2.61	0.00	Imperceptible	Negligible	2.62	2.62	0.00	Imperceptible	Negligible
5	2.57	2.57	0.00	Imperceptible	Negligible	2.57	2.57	0.00	Imperceptible	Negligible
6	2.55	2.55	0.00	Imperceptible	Negligible	2.55	2.55	0.00	Imperceptible	Negligible

Table 9-20 Maximum 8-hour CO Concentrations (mg/m3)

Year	Scenario	CO	NOx	PM ₁₀	C
		(kg/annum)	(kg/annum)	(tonnes/annum)	(tonnes/annum)
2026	Do Nothing	5711	968	4380	509
	Do Something	5832	989	4473	520
2041	Do Nothing	6356	1078	4876	567
	Do Something	6477	1098	4968	578
Increment in 2026		121 kg	21 Kg	93 Tonnes	11 Tonnes
Increment in 2041		121 kg	20 kg	92 Tonnes	11 Tonnes

Table 9-21 Regional Air Quality & Climate Assessment

Summary of Modelling Assessment

Levels of traffic-derived air pollutants for the development will not exceed the ambient air quality standards either with or without the proposed development in place. Using the assessment criteria outlined in Appendix 9.2, Table A1 – A3, the impact of the development in terms of PM₁₀, CO, NO₂, NO_x and benzene is negligible, long-term and imperceptible.

Regional Air Quality and Climate Impact

The regional impact of the proposed development on emissions of CO, NO_x, PM₁₀ and C has been assessed using the procedures of Transport Infrastructure Ireland. (*Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (Revision 1, 2011)*) The results (see Table 9.21) show the likely impact of the proposed development on the area with the increase traffic flow on the local roads. The likely overall magnitude of the changes on air quality and climate in the operational stage is imperceptible.

Human Health

Air dispersion modelling of operational traffic emissions 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. In terms of the operational stage air quality impacts will predominantly occur as a result of the change in traffic flows in the local areas associated with the proposed development. As demonstrated by the modelling results (Table 9.12 – 9.19), emissions as a result of the proposed development are compliant with all National and EU ambient air quality limit values and, therefore, will not result in a significant impact on human health.

9.6 POTENTIAL CUMULATIVE IMPACTS

In accordance with The Planning and Development Regulations 2001 as amended, this section has considered the cumulative impact of the proposed development in conjunction with future and current development in the vicinity of the subject site. This section relates to the cumulative impact on the subject site itself and on surrounding sites.

The European Commission’s report of May 1999 ‘Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions’ defines cumulative impact as follows:

“Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”.

The cumulative air quality impact of the developments in the Sword Road area which include existing residential developments, under construction developments and existing local transport infrastructure together with the proposed development is assessed with regard to having established the baseline air quality and then predicting the impact that the proposed development will have on the baseline air quality. The Whitehall Framework Plan has also been taken into consideration when outlining potential cumulative impacts. Together the combined impact can be assessed to determine if there is sufficient “atmospheric capacity” to facilitate the proposed development.

It is predicted from the modelling results (Table 9.14 – 9.21) that the cumulative impact of the construction and operational phases of the proposed development and proposed or permitted neighboring developments will not have an adverse long term impact on the receiving environment.

It is considered that in the absence of mitigation there is the potential for a short term slight negative cumulative impact associated with the construction phase of the subject development on ambient air quality and climate primarily as a result of the use of diesel to fuel construction plant and equipment. The proposed development will have a cumulative impact with the developments listed in section 9.5 above.

However, through the implementation of the mitigation measures and the integration into the design of the operational development of sustainable aspects and energy reduction features will ensure the receiving environment including off site residential receptors and existing habitats will not be adversely impacted.

9.7 MITIGATION MEASURES

Construction phase

Air Quality

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the dust management plan. The key aspects of controlling dust are listed below. Full details of the dust management plan can be found in Appendix 9.3.

- The specification and circulation of a dust management plan for the site and the identification of persons responsible for managing dust control and any potential 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 management plan can be monitored and assessed;
- The specification of effective measures to deal with any complaints received.

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. The procedures to rectify the problems are set out in appendix 9.3 (Dust Management Plan).

Dust nuisance is defined when air quality standards relating to dust deposition and PM₁₀ are exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented.

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of a Dust Management Plan (see appendix 9.3). Provided the dust management measures outlined in the plan (see Appendix 9.3) are adhered to, the air quality impacts during the construction phase will not be significant. Regard

has also been taken for the import of infill materials from off-site locations and potential dust impacts as a result of this will also be mitigated.

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 development. Construction vehicles, generators etc., may give rise to some CO₂ and N₂O emissions. However, due to short-term and temporary nature of these works, the impact on climate will not be significant. However, due to short-term and temporary nature of these works, the impact causes noticeable changes in the character of the environment but without significant consequences.

Nevertheless, some site-specific mitigation measures will be implemented during the construction phase of the proposed development to ensure emissions are reduced further. In particular the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising delivery vehicles due to poor timing or ordering on site will aid to minimise the embodied carbon footprint of the site.

Mitigation Measures (Construction)

- Avoid unnecessary vehicle movements and manoeuvring, and limit speeds on site so as to minimise the generation of airborne dust.
- Manual Stripping of buildings of internal fixings, metals, glass and asbestos.
- A 3m high solid wooden hoarding with a 3m high dust net shall be erected around the entire construction site perimeter giving a total dust barrier height of 6m.
- Use of rubble chutes and receptor skips during construction activities.
- All buildings in which asbestos has been identified shall be sealed during the asbestos removal process. Asbestos shall only be removed by an appropriately permitted company. All asbestos waste shall be double bagged, stored in a dedicated sealed waste container/skip prior to removal off-site for disposal at an appropriately permitted/licenced facility. Records of all asbestos waste removed from site shall be maintained by the site manager and certificates of destruction shall be provided by the asbestos removal contractor. Asbestos surveys shall be conducted by an appropriately HSE approved contractor.
- During dry periods, dust emissions from heavily trafficked locations (on and off site) will be controlled by spraying surfaces with water and wetting agents.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads will be restricted to essential site traffic only.
- A road sweeper vehicle shall be on-site at all times to clean soiled public roads in the vicinity of the site.
- A mobile wheel wash unit shall be installed at the site exit to wash down the wheels of all trucks exiting the site.
- An independent environmental consultant shall be appointed by the contractor to prepare a dust control and monitoring method statement prior to the commencement of site activities.
- A weekly inspection of each dust gauge will ensure that the site manager identifies at the earliest instance if dust suppression techniques shall be implemented at the project site areas.
- Re-suspension in the air of spillages material from trucks entering or leaving the site will be prevented by limiting the speed of vehicles within the site to 10kmh and by use of a mechanical road sweeper.
- The overloading of tipper trucks exiting the site shall not be permitted.
- Aggregates will be transported to and from the site in covered trucks.
- Where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser.

- Wetting agents shall be utilised to provide a more effective surface wetting procedure.
- Exhaust emissions from vehicles operating within the construction site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, rather than just following breakdowns; the positioning of exhausts at a height to ensure adequate local dispersal of emissions, the avoidance of engines running unnecessarily and the use of low emission fuels.
- All plant not in operation shall be turned off and idling engines shall not be permitted for excessive periods.
- 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.
- Material stockpiles containing fine or dusty elements including top soils shall be covered with tarpaulins.
- Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used to prevent unnecessary dust emissions by the erection of wind breaks or barriers. All concrete cutting equipment shall be fitted with a water dampening system.
- A programme of air quality monitoring shall be implemented at the site boundaries for the duration of construction phase activities to ensure that the air quality standards relating to dust deposition and PM₁₀ are not exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented.
- A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.

Table 9.22 presents a summary of dust control techniques which will be implemented at the site during activities.

SUMMARY OF DUST CONTROL TECHNIQUES	
Sources of Particular Matter	Control Technique
Loading and unloading processes	Containment / Suppression
	Reducing drop heights
	Use of variable height conveyors
Double handling transfer points	Use of chutes
	Site and process design
Aggregate stockpiles	Reduction of vehicle movements
	Appropriate siting
	Away from closest receptors/site boundaries
	Use of enclosures and bunding
	Reduced drop heights
	Water suppression
	Sprays
	Bowsers
	Covering
	Covered stock bins
Dust covers	
	Appropriate siting

Mobile Crushing of site generated C&D Waste (if applicable)	Away from closest receptors/site boundaries
	Use of enclosures and bunding
	Reduced drop heights
	Water suppression
	Sprays
Conveyors / transfer points	Bowers
	Containment
	Wind boards
	Housings
	Suppression
	Water sprays
	Housekeeping
	Clean up of spilled materials
Concrete Cutting Plant	Appropriate siting
	Away from closest receptors/site boundaries
	Suppression
Roadways including site yard area	Water sprays fitted to equipment/plant
	Suppression
	Water sprays and bowers
Vehicles	Wheel wash at site compounds
	Washing / Covering
	Wheel wash to be installed at site exit
	Vehicles exiting the site with C&D loads shall be covered with tarpaulin

Table 9-22 Summary of Dust Control Techniques

Operational Phase

No additional mitigation measures are required as the operational phase of the proposed development as it is predicted to have an imperceptible impact on ambient air quality and climate.

The operational phase mitigation by design measures to minimise the impact of the development on air quality and climate are as follows:

Mitigation Measures (Operational)

- Thermally efficient glazing systems on all units
- Mechanical Ventilation and Heat Recovery (MVHR) systems or equivalent installed in all apartments
- Thermal insulation of walls and roof voids of all units
- Natural Gas heating in all units
- Inclusion of electric car charging points to encourage electric vehicle ownership

9.8 'DO NOTHING' SCENARIO

The Do-Nothing scenario includes retention of the current site without the proposed residential development in place. In this scenario, ambient air quality at the site will remain as per the baseline and will change in accordance with trends

within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

9.9 WORST CASE SCENARIO

The main potential for adverse impact on local air quality will occur during the construction phase. The worst-case scenario therefore corresponds to the situation where the mitigation measures for construction activities fail or are not implemented. Should dust mitigation measures not be implemented during the construction phase, significant dust nuisance is likely in areas close to the construction site. Given the distance to sensitive receptors dust nuisance is not considered to be a significant issue providing mitigation measures are carried out.

9.10 MONITORING & REINSTATEMENT

Monitoring

Monitoring of construction dust deposition at nearby sensitive receptors (residential dwellings) during the construction phase of the proposed development will be carried out to ensure mitigation measures are working satisfactorily. This will be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/(m²*day) during the monitoring period between 28 – 32 days.

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

9.11 DIFFICULTIES IN COMPILING INFORMATION

There were no difficulties encountered in compiling this section of the EIAR.

9.12 RESIDUAL IMPACTS

Construction Phase

Air Quality

When the dust management measures detailed in the mitigation section of this Chapter (Section 9.7) are implemented, fugitive emissions of dust from the site will be neutral effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.

Climate

Impacts to climate during the construction phase are considered imperceptible and therefore residual impacts are not predicted. However, due to short-term and temporary nature of these works, the impact causes noticeable changes in the character of the environment but without significant consequences.

Operational Phase

Various elements associated with the construction phase of the proposed development have the potential to impact local ambient air quality, however the potential construction phase impacts shall be mitigated as detailed in Section 9.7 above to ensure there is a minimal impact on ambient air quality for the duration of all construction phase works. It is predicted that the operational phase of the development will not generate air emissions that would have an adverse impact on local ambient air quality or local human health. Air emissions can be further reduced by using operational mitigation measures and detailed in Section 9.7.

The results of the air dispersion modelling study indicate that the impacts of the proposed development on air quality and climate is predicted to be imperceptible with respect to the operational phase for the long and short term.

9.13 REFERENCES

- European Union (Planning & Development)(Environmental Impact Assessment) Regulations 2018 (SI No. 296 of 2018).
- Environmental Impact Assessment of Projects – Guidance on the preparation of the EIAR, European Commission, 2017.
- German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft
- Framework Convention on Climate Change (1997) Kyoto Protocol To The United Nations Framework Convention On Climate Change
- Framework Convention on Climate Change (1999) Ireland - Report on the in-depth review of the second national communication of Ireland
- Environmental Resources Management (1998) Limitation and Reduction of CO₂ and Other Greenhouse Gas Emissions in Ireland
- EU (2014) EU 2030 Climate and Energy Framework
- Department of the Environment, Heritage and Local Government (DEHLG) (2003) Strategy to Reduce Emissions of Trans-boundary Pollution by 2010 to Comply with National Emission Ceilings - Discussion Document
- 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 (2007a) 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
- Environmental Protection Agency (EPA) (2002) Guidelines On Information To Be Contained in Environmental Impact Statements
- UK DEFRA (2016a) Part IV of the Environment Act 1995: Local Air Quality Management, LAQM. PG
- UK DEFRA (2016b) Part IV of the Environment Act 1995: Local Air Quality Management, LAQM.TG
- 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
- EPA (2016) Air Quality Monitoring Report 2015 (& previous annual reports 1997-2014)
- EPA (2017) EPA Website: <http://www.epa.ie/whatwedo/monitoring/air/>
- UK DEFRA (2016) NO_x to NO₂ Conversion Spreadsheet (Version 5.1)
- Transport Infrastructure Ireland (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes
- Transport Infrastructure Ireland (2009) Guidelines for Assessment of Ecological Impacts of National Roads Schemes (Rev. 2, Transport Infrastructure Ireland, 2009)
- Department of the Environment, Heritage and Local Government (2010) Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities
- World Health Organisation (2006) Air Quality Guidelines - Global Update 2005 (and previous Air Quality Guideline Reports 1999 & 2000)
- Highways England (2013) Interim Advice Note 170/12 v3 Updated air quality advice on the assessment of future NO_x and NO₂ projections for users of DMRB Volume 11, Section 3, Part 1 'Air Quality
- EU (2017) Ireland's Final Greenhouse Gas Emissions in 2015
- BRE (2003) Controlling Particles, Vapours & Noise Pollution From Construction Sites
- 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
- UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance
- USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures
- USEPA (1986) Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition (periodically updated)

10 LANDSCAPE AND VISUAL

10.1 INTRODUCTION

This Landscape/Townscape and Visual impact Assessment report has been prepared in respect of proposed Strategic Housing Development at Hartfield Place, Whitehall, Dublin 9. This report describes the townscape/visual context of the proposed development and assesses the likely impacts of the scheme on the receiving environment, in terms of both townscape character and visual amenity.

The impact of the proposed development is assessed against both the existing baseline environment and the previously permitted development on site (DCC Reg. Ref 3269/10 and ABP Reg. Ref.PL 29N 238685). This is an extant permission at the time of writing this report.

The previously permitted scheme included 7 no. apartment blocks up to 7 storeys and a separate single storey creche building in a layout largely similar to the current proposed development. The current proposal is also for 7 no. apartment blocks but with an additional storey on the blocks resulting in heights up to 8 storeys. Considering the similarity between the previously permitted scheme and the current proposed development it has been deemed appropriate to assess the current proposal in comparison to the permitted development as well as the baseline. The comparative aspect of the assessment has been undertaken using a combination of the plans and elevations of the original permitted development (including the 2019 permitted amendment) relative to the photomontages which have been prepared in respect of the current proposed development. Outline montages have also been prepared to indicate the profile of the extant permission relative to the current proposed development.



Figure 10.1 Building elevations from the original (2010) permitted development



Figure 10.2 3D view of the modified Block F from the permitted 2019 amendment application

Landscape/townscape assessment relates to changes in the physical environment, brought about by a proposed development, which may alter its character. This requires a detailed analysis of the individual elements and characteristics of a landscape/townscape that go together to make up the overall character of that area. By understanding the aspects that contribute to this character it is possible to make judgements in relation to its quality (integrity) and to identify key sensitivities. This, in turn, provides a measure of the ability of the landscape/townscape in question to accommodate the type and scale of change associated with the proposed development, without causing unacceptable adverse changes to its character.

Visual Impact Assessment relates to changes in the composition of views as a result of changes to the landscape/townscape, how these are perceived and the effects on visual amenity. Such impacts are population-based, rather than resource-based, as in the case of landscape impacts.

Statement of Authority

This Landscape/Townscape and Visual Assessment report was prepared by Richard Barker, Principal Landscape Architect at Macro Works Ltd of Cherrywood Business Park, Loughlinstown, Dublin 18; a consultancy firm specialising in Landscape and Visual Assessment and associated maps and graphics. Relevant experience includes a vast range of infrastructural, industrial and commercial projects since 1999, including numerous mixed-used and residential development projects.

10.2 METHODOLOGY

Production of this Landscape/townscape and Visual Impact Assessment involved:

- A desktop study to establish an appropriate study area and relevant landscape and visual designations in the Dublin City County Development Plan 2016-2022;
- Fieldwork to study the receiving environment;
- Assessment of the significance of the landscape impact of the proposed development as a function of landscape sensitivity weighed against the magnitude of the landscape impact;

- Assessment of the significance of the visual impact of the proposed development as a function of visual receptor sensitivity weighed against the magnitude of the visual impact.

This document uses methodology as prescribed in the Institute of Environmental Management and Assessment (IEMA) and landscape Institute (UK) ‘Guidelines for Landscape and Visual Impact Assessment’ (GLVIA-2013). Although this is principally a ‘townscape’ assessment, it utilises the same outline methodology as would be employed for the more familiar Landscape and Visual Impact Assessment (LVIA) of developments in rural settings. The justification for this approach is provided below.

It is important to note that the Guidelines for Landscape and Visual Impact Assessment’ (GLVIA-2013) follow the European Landscape Convention (ELC) definition of landscape: ‘Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors’ (Council of Europe, 2000). Thus, GLVIA-2013 covers all landscapes from “high mountains and wild countryside to urban and fringe farmland (rural landscapes), marine and coastal landscapes (seascapes) and the landscapes of villages towns and cities (townscapes)” - whether protected or degraded.

In the case of this project, the study area is overwhelmingly that of an urban setting or ‘townscape’ and this is defined in GLVIA-2013 in the following manner (Section 2.7):

“ ‘Townscape’ refers to areas where the built environment is dominant. Villages, towns and cities often make important contributions as elements in wider-open landscapes but townscape means the landscape within the built-up area, including the buildings, the relationships between them, the different types of urban spaces, including green spaces, and the relationship between buildings and open spaces. There are important relationships with historic dimensions of landscape and townscape, since evidence of the way the villages, towns and cities change and develop over time contributes to their current form and character.”

Landscape/townscape Impact Assessment Criteria

When assessing the potential impacts on the townscape resulting from a proposed development, the following criteria are considered:

- Landscape/townscape character, value and sensitivity;
- Magnitude of likely impacts;
- Significance of landscape effects.

The sensitivity of the townscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. Landscape/townscape Value and Sensitivity is classified using the following criteria set out in Table 10.1.

Sensitivity	Description
Very High	Areas where the townscape character exhibits a very low capacity for change in the form of development. Examples of which are high value townscapes, protected at an international or national level (e.g. World Heritage Site), where the principal management objectives are likely to be protection of the existing character.

High	Areas where the townscape character exhibits a low capacity for change in the form of development. Examples of which are high value townscapes, protected at a national or regional level, where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the townscape character exhibits some capacity and scope for development. Examples of which are townscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the townscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated townscapes that may also have some elements or features of recognisable quality, where management objectives include, enhancement, repair and restoration.
Negligible	Areas of townscape character that include derelict sites and degradation where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of townscape improvements and/or restoration.

Table 10.1: Landscape/Townscape Value and Sensitivity

The magnitude of a predicted landscape/townscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed Development. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape/townscape components and/or a change that extends beyond the immediate setting that may have an effect on the townscape character. Table 10.2 refers.

Sensitivity	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the townscape in terms of character, value and quality.
High	Change that would be more limited in extent and scale with the loss of important townscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the townscape in terms of character, value and quality.

Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable.
Positive	Changes that restore a degraded landscape or reinforce characteristic landscape elements.

Table 10.2: Magnitude of Landscape/Townscape Impacts

The significance of a landscape/townscape impact is based on a balance between the sensitivity of the landscape receptor and the magnitude of the impact. The significance of landscape impacts is arrived at using the following matrix set out in Table 10.3.

Scale/ Magnitude	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
Very High	Profound	Profound-substantial	Substantial	Moderate	Minor
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Table 10.3: Impact Significance Matrix

Note: The significance matrix provides an indicative framework from which the significance of impact is derived. The significance judgement is ultimately determined by the assessor using professional judgement. Due to nuances

within the constituent sensitivity and magnitude judgements, this may be up to one category higher or lower than indicated by the matrix. Judgements indicated in orange are considered to be 'significant impacts' in EIA terms.

Visual Impact Assessment Criteria

As with the landscape/townscape impact, the visual impact of the proposed Development will be assessed as a function of sensitivity versus magnitude. In this instance the sensitivity of the visual receptor, weighed against the magnitude of the visual effect.

Sensitivity of Visual Receptors

Unlike landscape sensitivity, the sensitivity of visual receptors has an anthropocentric (human) basis. It considers factors such as the perceived quality and values associated with the view, the landscape/townscape context of the viewer, the likely activity they are engaged in and whether this heightens their awareness of the surrounding landscape. A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below to establish visual receptor sensitivity at each VRP:

Susceptibility of Receptors

In accordance with the Institute of Environmental Management and Assessment ("IEMA") Guidelines for Landscape and Visual Assessment (3rd edition 2013) visual receptors most susceptible to changes in views and visual amenity are:

- "Residents at home;
- People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;
- Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;
- Communities where views contribute to the landscape setting enjoyed by residents in the area;
- Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened".

Visual receptors that are less susceptible to changes in views and visual amenity include;

- "People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape;
- People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life".

Recognised scenic value of the view (County Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Developments Plans, for example, a public consultation process is required;

Views from within highly sensitive townscape areas. These are likely to be in the form of Architectural Conservation Areas, which are incorporated within the Development Plan and therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the townscape around them;

Primary views from residential receptors. Even within a dynamic city context views from residential properties are an important consideration in respect of residential amenity;

Intensity of use, popularity. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at a national or regional scale;

Viewer connection with the townscape. This considers whether or not receptors are likely to be highly attuned to views of the townscape i.e. commuters hurriedly driving on busy roads versus tourists focussed on the character and detail of the townscape;

Provision of vast, elevated panoramic views. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;

Sense of remoteness and/or tranquillity. Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;

Degree of perceived naturalness. Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;

Presence of striking or noteworthy features. A view might be strongly valued because it contains a distinctive and memorable landscape / townscape feature such as a cathedral or castle;

Historical, cultural and / or spiritual significance. Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;

Rarity or uniqueness of the view. This might include the noteworthy representativeness of a certain townscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;

Integrity of the townscape character. This looks at the condition and intactness of the townscape in view and whether the townscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;

Sense of place. This considers whether there is special sense of wholeness and harmony at the viewing location;

Sense of awe. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity. No relative importance is inferred by the order of listing. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

Visual Impact Magnitude

The visual impact magnitude relates to the scale and nature of the visual change brought about by the proposal and this is reflected in the criteria contained in Table 10.4 below.

Criteria	Description
Very High	The proposal alters a large proportion or critical part of the available vista and is without question the most distinctive element. A high degree of visual clutter or disharmony is also generated, strongly reducing the visual amenity of the scene
High	The proposal alters a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual clutter or disharmony is also likely to be generated, appreciably reducing the visual amenity of the scene
Medium	The proposal represents a moderate alteration to the available vista, is a readily noticeable element and/or it may generate a degree of visual clutter or disharmony, thereby reducing the visual amenity of the scene.
Low	The proposal alters the available vista to a minor extent and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene.
Negligible	The proposal would be barely discernible within the available vista and/or it would not detract from, and may even enhance, the visual amenity of the scene.
Positive	Changes that enhance the available vista by reducing visual clutter or restoring degraded features.

Table 10.4: Magnitude of Visual Impacts

Visual Impact Significance

As stated above, the significance of visual impacts is a function of visual receptor sensitivity and visual impact magnitude. This relationship is expressed in the same significance matrix and applies the same EPA definitions of significance as used earlier in respect of townscape impacts (Table 10.3 refers).

Extent of Study Area

It is anticipated that the proposed development is not likely to give rise to significant landscape/townscape or visual impacts beyond approximately 1km. As a result, a 1km-radius study area is used in this instance.



Figure 10.3 Oblique view (looking north) of the 1km radius Study area for the proposed development

10.3 RECEIVING ENVIRONMENT

The landscape/townscape baseline represents the existing context and is the scenario against which any changes to it, brought about by the proposed development, will be assessed. A description of the landscape/townscape context of the proposed site and wider study area is provided below. Although this description forms part of the landscape/townscape baseline, many of the elements identified also relate to visual receptors i.e. places from which viewers can potentially see the proposed Development. The visual resource will be described in greater detail in Section 10.7.

Baseline Environment

Immediate Site Context

The site itself is currently a 'brownfield' site contained in rough grassland and scrub behind a tall masonry wall (along with hoarding) fronting the Swords Road, which lies immediately west. Existing residential dwellings occur on the opposite side of the Swords Road. To the south is Highfield Hospital, to the north is vacant land and the Whitehall Colmcille GAA pitches and to the east is Beechlawn Nursing Home.

Study Area Context

The majority of the surrounding townscape fabric beyond the immediately abutting land uses is contained in medium density housing estates, however, notable exceptions include Clonturk Community College and Home Farm Football Club, which adjoin each other on lands to the southwest on the opposite side of the Swords Road.

The Whitehall civic centre and the large Whitehall Holy Child Church are located a short distance to the north of the site. Further beyond is Ellenfield Park and to the northwest is Holy Child Boys national School. Overall, both the site and the wider study area can be categorised as a blend of residential, institutional and neighbourhood amenity uses.

The main transport routes include the Swords Road abutting to the west of the site and Collins Avenue to the north, both of which are busy roads hosting bus corridors. The tree-lined Griffith Avenue runs parallel to Collins Avenue (east-west) around 500m to the south of the site, whilst Grace Park Road runs parallel to the Swords Road around 200m to the east of the site.

PLANNING CONTEXT

Dublin City Development Plan (CDP) 2016-2022

In terms of land use zoning (Map B of the Dublin CDP) the proposed development is contained in 'Zone Z12', whose zoning objective is to "To ensure existing environmental amenities are protected in the predominantly residential future use of these lands." The site is surrounded by predominantly standard residential zoning ((Z1) and the CDP describes the rationale for the Z12 zoning on the following basis;

"These are lands the majority of which are in institutional use, which could possibly be developed for other uses. These areas include existing community and recreation related development including schools and colleges, residential health care institutions (e.g. hospitals) and other community uses (such as club meeting facilities including scout and guide halls). Significant ancillary facilities such as staff accommodation and dedicated open space and sports/ recreational facilities are also included."

Designated Scenic Views and Prospects

Also contained within Chapter 4 is a map illustrating views and prospects for protection. However, there are no designated views and prospects within the study area.

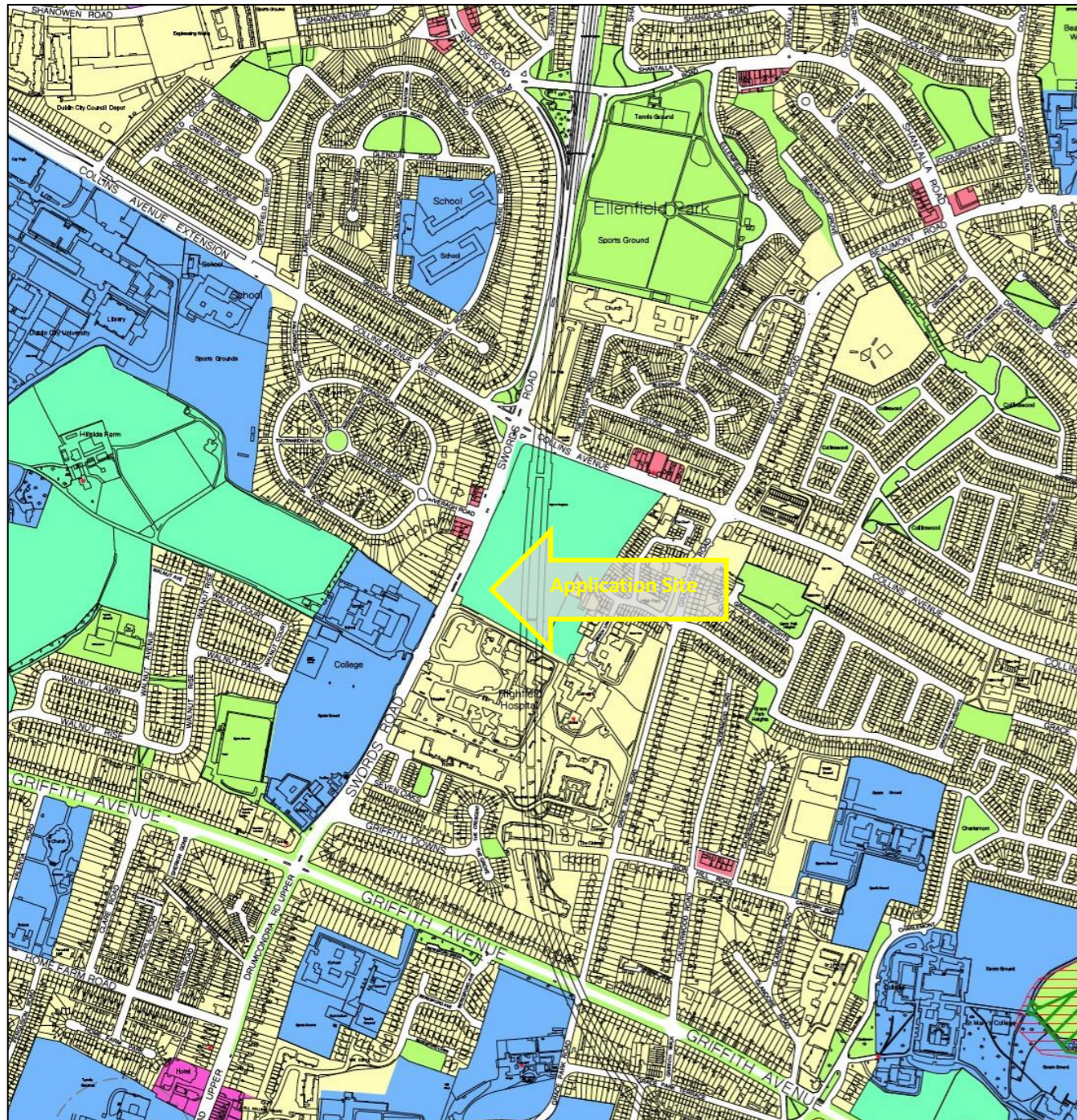


Figure 10.4: Extract of Map B of the Dublin CDP, showing how the site is contained within 'Z12' designation

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

The Urban Development and Building Guidelines were adopted in December 2018 by the Minister for Housing, Planning and Local Government “to secure better and more compact forms of future development.”

Policies stated within the UDBH guidelines that may be relevant to the proposed development are included below:

SPPR1: In accordance with Government policy to support increased building height in locations with good public transport accessibility, particularly town/city cores, planning authorities shall explicitly identify, through their statutory plans, areas where increased building height will be

actively pursued for both redevelopment and infill development to secure the objectives of the National Planning Framework and Regional Spatial and Economic Strategies and shall not provide for blanket numerical limitations on building height.

SPPR 2: In driving general increases in building heights, planning authorities shall also ensure appropriate mixtures of uses, such as housing and commercial or employment development, are provided for in statutory plan policy. Mechanisms such as block delivery sequencing in statutory plans² could be utilised to link the provision of new office and residential accommodation, thereby enabling urban redevelopment to proceed in a way that comprehensively meets contemporary economic and social needs, such as for housing, offices, social and community infrastructure, including leisure facilities.

Section 3.2 of the UDBH guidelines also lists development management criteria from the city/town scale to the site/building scale in which “the applicant shall demonstrate to the satisfaction of the Planning Authority/ An Bord Pleanála, the proposed development satisfies the following criteria...” Those criteria deemed relevant to this visual impact assessment and the proposed development are included below.

At the scale of the relevant city/town:

- Development proposals incorporating increased building height, including proposals within architecturally sensitive areas, should successfully integrate into/ enhance the character and public realm of the area, having regard to topography, its cultural context, setting of key landmarks, protection of key views. Such development proposals shall undertake a landscape and visual assessment, by a suitably qualified practitioner such as a chartered landscape architect.
- On larger urban redevelopment sites, proposed developments should make a positive contribution to place-making, incorporating new streets and public spaces, using massing and height to achieve the required densities but with sufficient variety in scale and form to respond to the scale of adjoining developments and create visual interest in the streetscape.

10.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will consist of the construction of 7 no. blocks in heights up to 8 storeys (over single level basement) comprising 472 no. apartment units, a creche, café unit, and internal residential amenity space. The proposal also includes car, cycle, and motorcycle parking, public and communal open spaces, landscaping, bin stores, plant areas, substations, switch rooms, and all associated site development works and services provision. Access is provided from the development from Swords Road with associated upgrades to the existing public road and footpaths. A full description of the development is provided in the statutory notices and in Chapter 3 of the EIAR submitted with the application.

10.5 POTENTIAL IMPACTS

Identification of Viewshed Reference Points as a Basis for Assessment

Viewshed Reference Points (VRP's) are the locations used to study the likely visual impacts associated with the proposed development. It is not warranted to include each and every location that provides a view as this would

result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the proposed development. Instead, the selected viewpoints are intended to reflect a range of different receptor types, distances and angles. The visual impact of a proposed development is assessed using up to 6 categories of receptor type as listed below:

- Key Views - from features of national or international importance;
- Designated Scenic Routes and Views;
- Local Community views;
- Centres of Population;
- Major Routes;
- Amenity and heritage features.

The Viewshed Reference Points selected in this instance are set out in Table 10.5 and shown on Figure 10.5 below.

VP2a	Swords Road immediately north of site	S
VP3	Iveragh Road	SE
VP3a	Swords Road immediately south of site	NE
VP4	Swords Road adjacent to the Bonnington Hotel	NE
VP5	Collins Avenue at Whitehall GAA ground	SW
VP6	High Park residential estate	W
VP7	Grace Park Road	NW

Table 10.5: Outline Description of Selected Viewshed Reference Points (VRPs)

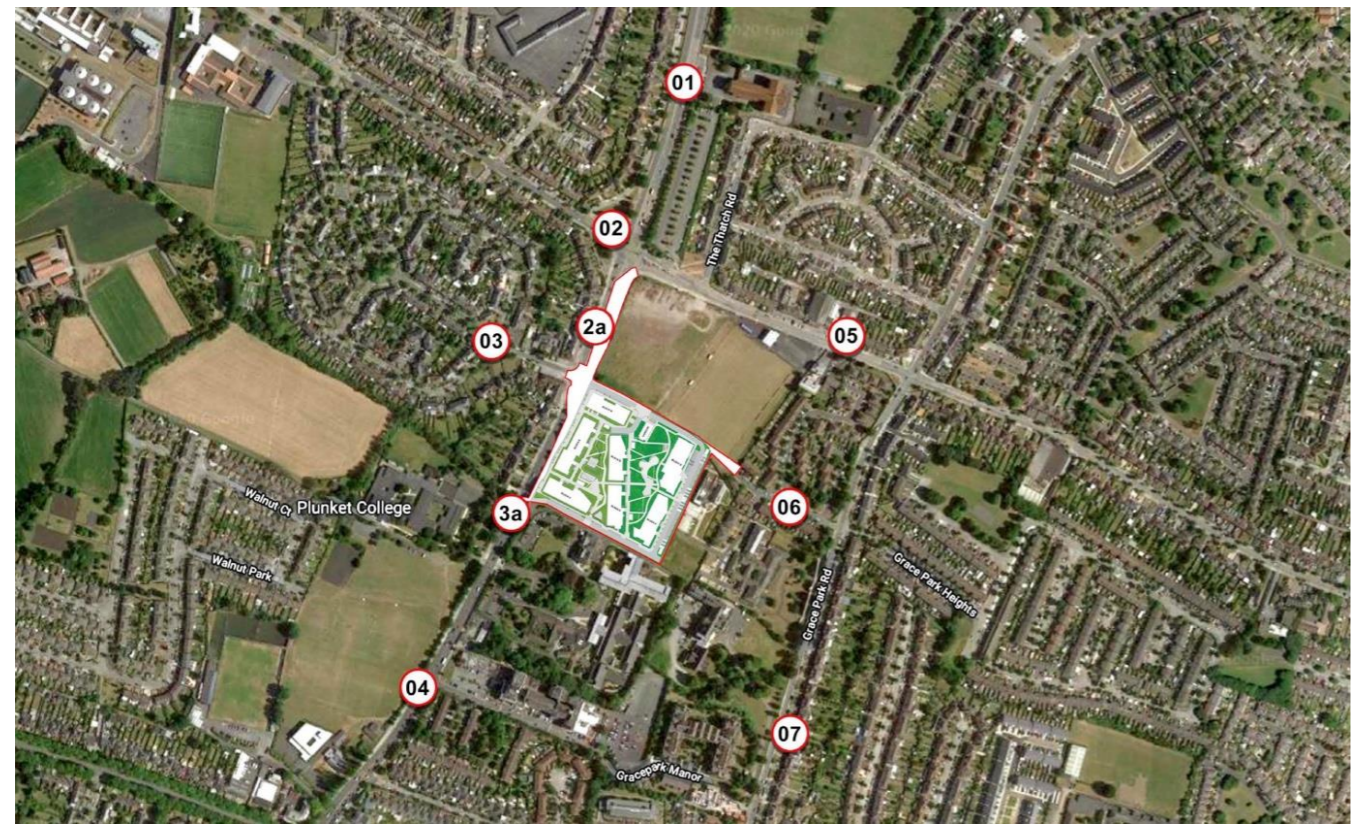


Figure 10.5: Viewpoint Selection Map (Source - Model Works)

VRP No.	Location	Direction of view
VP1	Swords Road near Whitehall Church	S
VP2	Intersection of Swords Road and Collins Avenue West	S

10.6 LANDSCAPE/TOWNSCAPE IMPACTS

Landscape/townscape value and sensitivity
In accordance with Section 5.5 of the GLVIA-2013, a townscape character assessment requires a particular understanding of, among other criteria, “the context or setting of the urban area and its relationship to the wider landscape.” In a city that has evolved over millennia, the study area near its northern perimeter is a relatively recent addition.

The site itself is a brownfield site primed for redevelopment for nearly a decade and is of no particular landscape merit in its current form other than as an area of perceived open space, albeit contained in private ownership behind a tall masonry wall. Indeed, the perception is just as likely to be a leftover area of dereliction given that the surrounding suburb of Whitehall is extensively developed for residential housing and various institutional, commercial and community amenity uses. The site appears as a notable gap in the development fronting the Swords Road, which is the main thoroughfare to and from Dublin Airport.

Being close to the periphery of the city on a major arterial route, this is an evolving townscape subject to near constant changes in the built environment and thus, it is not inherently sensitive to change and appears to have limited overt heritage value.

On balance of the factors outlined above, the sensitivity of the receiving townscape setting is considered to be **Low**.

Magnitude of Landscape/townscape effects

Construction Phase
During construction the site and immediate environs would be disturbed by construction activities, the transport and storage of materials and equipment, and the incremental growth of the buildings on site. This is a brownfield site where such land cover disturbance is of little consequence in a physical sense as no sensitive features will be

lost. Furthermore, there will be a wall and hoarding in place to screen much of the ground level activity and clutter as well as early construction stage excavations and the emerging ground floors.

Construction of mid to large scale developments is a commonplace and almost continual feature of urban areas particular those in peri-urban locations ripe for infill development such as this. Consequently, the general perception is that construction stage effects will be negative, but of temporary or short-term duration without undue consequence for the prevailing landscape / townscape character. Overall, the magnitude of townscape impacts will be High-medium and negative in close proximity to the site decreasing rapidly with distance and broader context.

Construction stage visual effects will be closely aligned with those relating to townscape character, being a balance between general visual clutter and complexity but of a familiar form and a short term duration.

In the context of the landscape / townscape sensitivity judgement, the overall significance of construction stage effects is not considered to exceed **Moderate and negative**.

It is worth noting there will be very little difference in these effects between the currently permitted development and the proposed increase in height in terms of impact from construction works. There is likely to be a marginally extended timeframe for construction to complete the taller buildings, but the duration will remain 'short-term' (1-7 years) in respect of EPA definitions. Thus, the incremental construction stage impacts will be **Negligible** relative to the do-nothing scenario.

Operational Phase

Following the completion of the proposed works, landscape/townscape impacts will relate entirely to the development's impact on the character of the receiving landscape/townscape and whether this is positive or negative.

The principle of this general scale and nature of development at this location is not at issue here, this is a zoned residential site which has the benefit of an extant permission, and also has a Framework Plan for this area providing for residential development of a similar nature on this site. The issue is whether the current proposed development will generate a higher and therefore potentially significant impact relative to the permitted development. It is noted that notwithstanding that the land uses in immediate proximity to the site are of a larger scale than the residential housing that occupies the majority of the study area, the permitted development will be the largest scale and most intensive development within the immediate area. The proposed addition of a further storey will marginally increase the scale and intensity of the development, but not to the degree that it appears over-scaled relative to its environs. In this respect, the proposed development will marginally increase the scale and intensity of development within this area, but in the form of a setback, light construction additional storey to select buildings. Due to the setback from the main building line, this may not even be noticeable at close quarters where any increase in scale and overbearing is most likely to be experienced. Instead, the additional storey, will generally be more noticeable from beyond c. 100m and in such circumstances the development is seen in the context of surrounding development that consists of both residential housing and larger scale institutional facilities such as a Hospitals, Nursing Homes and schools. Instead, it is still likely to be perceived as a node of high-density residential development within the wider matrix of medium to low density housing - a form of development that is consistent with current trends within the bounds of the M50 motorway that circulates Dublin City.

Overall, the proposed development is considered to give rise to a very minor increase in the impact on landscape / townscape character when compared to the permitted development and therefore, the impact is deemed to be **Low-negligible**. While the development as a whole, including the permitted development, could be considered a **Medium and positive** impact relative to the brownfield baseline context, which reads as a perceptual void in the built fabric of the area.

Significance of Landscape/townscape effects

In accordance with the Landscape/Visual significance matrix contained in Table 10.3, the combination of a 'Low' townscape sensitivity judgement and a 'Low-negligible' townscape impact magnitude judgment results in a **'Slight-imperceptible'** overall significance of townscape impact. While the development as a whole, results in a **Moderate Positive** overall significance of townscape impact.

10.7 VISUAL IMPACT ASSESSMENT

Visual Receptor Sensitivity

In consideration of the visual receptor criteria set out in section 10.3, the main variation in the nature of views and those availing of those views, in this instance, relates to whether they represent busy arterial road corridors or quiet residential enclaves. In both cases visual amenity is relatively limited in this typical suburban area but for the latter there is a higher degree of susceptibility to change in everyday views experienced from dwellings. Consequently, the visual sensitivity for VP3 and VP6 is deemed to be **Medium-low** and for all remaining views is deemed to be **Low**.

Magnitude of Visual Effect

The assessment of visual impacts at each of the selected viewpoints is aided by verifiable photomontages of the proposed development. Photomontages are a 'photo-real' depiction of the scheme within the view, utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced:

1. Existing View
2. Montage View upon completion of the proposed development

In this instance, the visual impact assessment is also aided by a set of images (based on the photomontage set) that have been annotated to show the proposed development relative to the existing environment. These can be found immediately ahead of each viewpoint assessment. The proposed building profile is indicated in red and the permitted building profile is indicated in yellow.



Figure 10.6: VP1 Outline comparison with permitted development

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP1	Swords Road near Whitehall Church	374m	S

Representative of:

- Major route
- Local community views

Receptor Sensitivity Low
Existing View

This is a view from the middle of the busy four lane plus bus lane Swords Road representing the vista afforded to southbound road users travelling from the direction of Dublin Airport. It is a tree-lined section of road and these street trees largely confine views to the road corridor, but with glimpses beneath of adjoining roads and the car park for Whitehall Church. A small section of the Dublin Mountains will be seen in the far distance on alignment with the road.

View incorporating the permitted development

The permitted development will be seen fronting the left-hand side of the Swords Road in the middle distance, but it is a partial view between sections of roadside vegetation. It is not particularly prominent and serves to consolidate the street scene. The visual impact is deemed to be Medium-low and the quality of effect, positive

Visual Impact of proposed development

The proposed height increase to Blocks A, B and C will be apparent from here as it will bring the development slightly above the intervening roadside treeline. There will be a noticeable, albeit marginal increase in the intensity and scale of the development, but this will not render it inappropriate or over-

scale relative to other development within this scene, which principally consist of a wide and busy road corridor. The set back and alternative materials of the light construction addition to Blocks B and C will add welcome complexity to the façade / roofline and richness to the overall built form of the development. On balance of these factors, the magnitude of visual impact is deemed to be Low-negligible and this will not contribute to a significant visual impact for the overall development.

Summary

Based on the assessment criteria and matrices outlined at 10.2 Methodology the significance of residual visual impact is summarised below.

Permitted development Impact Significance Increase in height impact significance

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Low	Medium-low	Slight / Positive
Low	Low-negligible	Slight-imperceptible/ Neutral



Figure 10.7: VP2 Outline comparison with permitted development

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP2	Intersection of Swords Road and Collins Avenue West	184m	S

Representative of:

- Major routes
- Local community views

Receptor Sensitivity Low

Existing View This is a view across the major intersection between Swords Road and Collins Avenue in the direction of the site, which currently reads as a large empty space confined by a masonry wall that visually confirms that this is a vacant lot rather than a public park. The view is framed on the right-hand side by mature trees in the foreground.

View incorporating the permitted development The permitted development will rise into view from the southern end of the open space across the intersection. The most prominent buildings will be 'Block A' fronting the Swords Road and 'Block F' on the eastern side of the development. There is a notable open space between these blocks within the development. The permitted development provides a stronger sense of enclosure to the street scene, but without appearing overbearing. The visual impact is deemed to be Medium-low and of a positive quality.

Visual Impact of proposed development The proposed height increase to Block A will be apparent from here as it slightly increases the scale and intensity of the nearest component of the development. There is a more noticeable difference in height to Block F, which generates a desirable sense of perspective and a more varied profile/skyline for the development with the larger element fronting the busy road corridor in a legible manner. The proposed height increase to Block A will not result in the development appearing inappropriately large in this street scene and overall, the magnitude of visual impact is deemed to be Low-negligible.

Summary Based on the assessment criteria and matrices outlined at **10.2 Methodology** the significance of residual visual impact is summarised below.

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Low	Medium-low	Slight/ Positive
Low	Low-negligible	Slight-imperceptible/ Positive

Permitted development Impact Significance
Increase in height Impact Significance



Figure 10.8: VP2a Outline comparison with permitted development

Viewshed Reference Point	Viewing distance to site boundary	Direction of View
VP2a Swords Road immediately north of site	81	S

Representative of:

- Major route
- Local community views

Receptor Sensitivity Low

Existing View This is an axial view along the Swords Road in a southerly direction. The view is contained on its western side by two-storey houses and commercial premises, whereas, to the east there is a notable open area beyond the tall roadside wall. The busy multi-lane road corridor is the dominant presence within this scene.

View incorporating the permitted development The permitted development reads as a series of mid-scale (6/7 storey) integrated apartment blocks fronting the opposite side of the Swords Road in the near distance with another line of apartment blocks setback from the road further to the east. There is a considerably greater scale and intensity of development to the eastern side of the road compared to the west, but not disproportionately so and there is some consolidation of the perceptual void that currently exists. The visual impact is deemed to be High-medium and of a positive quality.

Visual Impact of proposed development

The additional storey proposed for each of the roadside apartment blocks (Block A, Block B and Block C) can be readily seen from here, especially in respect of the northern end of nearest Block A. The additional storeys are setback from the main roadside façade, which diminishes their perceived scale from the road, but for the northern side of Block A the additional level extends the façade directly. There is no additional height for the setback Block F which can be seen to the rear of Block A.

The proposed additional level for the roadside blocks is noticeable, but not prominent and without marked consequence for the nature of the street scene. Nor will it contribute to a sense of scale disparity or overbearing in relation to the street. For these reasons, the magnitude of visual impact is deemed to be Low-negligible.

Summary

Based on the assessment criteria and matrices outlined at **10.2 Methodology** the significance of residual visual impact is summarised below.

Permitted development Impact Significance Increase in height Impact Significance

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Low	High medium	Moderate / positive
Low	Low-negligible	Slight-imperceptible/ Neutral

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP3	Iveragh Road	105m	SE

Representative of:

- Local community views

Receptor Sensitivity Existing View

Medium low
This is a view along Iveragh Road towards its intersection with the Swords Road. The relatively short section of road between the roundabout in the foreground and the Swords Road intersection is lined by a combination of street trees and residential houses as well as commercial premises nearer the corner. Beyond the intersection is currently open space.

View incorporating the permitted development

Block A of the permitted development will rise into view on the opposite side of the intersection just to the right of the Iveragh road alignment. It will be a prominent feature that partly truncates and encloses the south-eastward view. The visual impact is deemed to be Medium and of a neutral quality.

Visual Impact of proposed development

The proposed height increase to Block A will be apparent from here stepped back from its main roadside facade. It presents as a very minor increase to the overall height of the building and its set-back design diminishes the perceived scale increase. The height increase will not result in Block A appearing over-scaled or out of place in this street scene and given that none of the rest of the development can be seen from here the impact is deemed to be **Negligible**.

Summary

Based on the assessment criteria and matrices outlined at **10.2 Methodology** the significance of residual visual impact is summarised below.

Permitted development Impact Significance Increase in height Impact Significance

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Low	Medium	Slight/ Neutral
Medium low	Negligible	Imperceptible



Figure 10.9: VP3 Outline comparison with permitted development



Figure 10.10: VP3a Outline comparison with permitted development

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP3a	Swords Road immediately south of site	50m	N

Representative of:

- Major route
- Local community views

Receptor Sensitivity Low
Existing View

This is the reverse axial view along the Swords Road to that depicted for VP2a and in this case the view is in a northerly direction. The view is contained on its western side by two-storey houses beyond a roadside wall, berm and paladine fence combination. The busy multi-lane road corridor is the dominant presence within this scene and there is a distinct open-space void to the northeast in the direction of the site.

View incorporating the permitted development

Block C of the permitted development is the nearest and most prominent aspect of the development fronting onto the Swords Road. There is a strong sense of perspective generated between this and the subsequent Block B and Block A apartments, which also front the road at further distances. As the residential houses to the west appear to be on slightly elevated ground there is not a sense of scale dominance between development on the respective sides of the road. The visual impact is deemed to be High and of a positive quality.

Visual Impact of proposed development

The additional storey proposed for each of the roadside apartment blocks (Block C, Block B and Block A) are only subtly noticeable from here due to their setback from the main facades and darker / lighter design. The overall scale and intensity of the development is only marginally increased by the proposed additional level and it adds a richness and contrast to the design. On balance of these very nuanced factors, the magnitude of visual impact from the proposed height extension is deemed to be **Negligible**.

Summary

Based on the assessment criteria and matrices outlined at 10.2 Methodology the significance of residual visual impact is summarised below.

Permitted development Impact Significance
Increase in height Impact Significance

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Low	High	Moderate/ Positive
Low	Negligible	Slight-imperceptible/ Neutral



Figure 10.11: VP4 Outline comparison with permitted development

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP4	Swords Road adjacent to the Bonnington Hotel	264m	NE

Representative of:

- Major route

- Local community views

Receptor Sensitivity Low

Existing View

This northerly view along the Swords Road is dominated by the broad carriageway itself and then the Bonnington Hotel, which is set back from the road beyond an associated commercial premises (Centra) at the roadside. Further along the road, tall walls and roadside vegetation constrain the vista to the road corridor.

View incorporating the permitted development

Only the merest glimpse of the permitted development is afforded from here between roadside treetops. While this hints at a considerable scale of development beyond the road corridor, it may not be noticed at all by a casual observer. The magnitude of visual impact is deemed to be Low-negligible and the quality of effect is Neutral.

Visual Impact of proposed development

The proposed height increase to Block C will rise slightly more prominently within the same vegetation gap that currently affords a glimpse of the permitted Block C. However, this still represents a minute proportion of the overall development. Although it represents very minor visual change, the new section of taller roofline does imply a greater scale and intensity of development just beyond the treeline. Nonetheless, the impact on visual amenity is deemed to be Negligible.

Summary

Based on the assessment criteria and matrices outlined at **10.2 Methodology** the significance of residual visual impact is summarised below.

Permitted development Impact Significance
Increase in height Impact Significance

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Low	Low-negligible	Slight-imperceptible/ Neutral
Low	Negligible	Imperceptible



Figure 10.12: VP5 Outline comparison with permitted development

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP5	Collins Avenue at Whitehall GAA ground	226m	SW

Representative of:

- Major route
- Local community views

Receptor Sensitivity Low
Existing View

This is a relatively open view for an otherwise urban setting as it looks across the grounds of the Whitehall Colmcille GAA grounds from a row of commercial premises. The view is framed by a modest scale apartment complex to the left and the GAA clubrooms building to the right.

View incorporating the permitted development

The northern and western sides of the permitted development are openly visible from here across the playing fields and will contain this section of the view to a noticeably greater degree. The development has a relatively broad lateral extent and the scale and intensity of built development is increased, but the vertical scale remains modest from this distance. The visual impact is deemed to be Medium and of a Neutral quality.

Visual Impact of proposed development

The proposed height increase to Block A and Block D will be noticeable from here, but only contributing in a very minor way to increased scale and intensity. The taller roofline of the nearer Block A aids the sense of perspective across the development, whilst making the profile desirably less

uniform. On balance, the magnitude of visual impact from the proposed height increase is deemed to be Low-negligible.

Summary

Based on the assessment criteria and matrices outlined at **10.2 Methodology** the significance of residual visual impact is summarised below.

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Low	Medium - Low	Moderate-slight/ Neutral
Low	Low-negligible	Slight-imperceptible/ Neutral

Permitted development Impact Significance
Increase in height Impact Significance

View incorporating the permitted development

The uppermost roof profile of the proposed Block F will rise just into view above the similar flat profile of the Beechlawn Nursing Home building. Indeed they blend together so that the developments are barely distinguishable. The visual impact is deemed to be Low-negligible and of a Neutral quality.

Visual Impact of proposed development

Block F will be marginally closer to the eastern boundary as part of the current proposal given the impression of fractionally increased height relative to the permitted block F. Thus, there will be a very minor change to the permitted view. However, not to the degree that the increase in effect could be considered more than Negligible.

Summary

Based on the assessment criteria and matrices outlined at **10.2 Methodology** the significance of residual visual impact is summarised below.

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Medium Low	Low-negligible	Slight-imperceptible/ Neutral
Medium low	Negligible	Imperceptible

Permitted development Impact Significance
Increase in height Impact Significance



Figure 10.13: VP6 Outline comparison with permitted development

Viewshed Reference Point	Viewing distance to site boundary	Direction of View
VP6 High Park residential estate	128m	W

Representative of:

- Local community views

Receptor Sensitivity Medium low

Existing View This is a well contained view from within the High Park residential enclave. The view is flanked in the foreground by semi-detached dwellings and street trees, whilst the flat roof of a pale brick clad building from the Beechlawn nursing home rises above the end of the cul-de-sac.



Figure 10.14: VP7 Outline comparison with permitted development

Viewshed Reference Point	Viewing distance to site boundary	Direction of View
VP7 Grace Park Road	269m	NW

Representative of:

- Major route
- Local community views

Receptor Sensitivity Low

Existing View This is a view from Grace Park Road looking across a parkland setting of grass and mature specimen trees in the direction of the site. The roadside boundary is contained by an ornate hoop-topped railing mounted on a plinth wall between masonry piers.

View incorporating the permitted development The permitted development (Block F) is partially visible between intervening trees but only to a very minor degree such that it is unlikely to be noticed by a casual observer.

Visual Impact of proposed development Block F is remaining unchanged in terms of its height in the current proposal and the permitted view will therefore remain substantially unchanged. The magnitude of visual impact is **Negligible** by default.

Summary Based on the assessment criteria and matrices outlined at **10.2 Methodology** the significance of residual visual impact is summarised below.

	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Permitted development Impact Significance	Low	Negligible	Imperceptible
Increase in height Impact Significance	Low	Negligible	Imperceptible

10.8 MITIGATION MEASURES

Construction Phase

The main mitigation measure employed at construction stage, which will benefit landscape and visual receptors, is the use of a solid construction hoarding around the site. Although this has numerous safety and mitigation functions including the reduction of dust and noise, it will screen cluttered views of stockpiles of excavated material and building materials as well as the movement of ground based workers and machinery. It will also screen basement and ground floor construction elements until such time as the higher storeys emerge above the hoarding.

Operational Phase

Specific operational stage landscape and visual mitigation is not deemed necessary in this instance, as the building and landscape design that contributes to generally positive landscape and visual effects is embedded within the design of the development that has been assessed herein.

10.9 PREDICTED IMPACTS

Construction Phase

As noted in section 10.6, in the context of the landscape/ townscape sensitivity judgement, the overall significance of construction stage effects is not considered to exceed moderate and negative.

Operational Phase

Since no mitigation measures have been proposed, the predicted impacts are as outlined in Section 10.7

10.10 DO NOTHING SCENARIO

The do-nothing scenario would result in the extant permission expiring and the subject site remaining undeveloped. The undeveloped brownfield site will remain a negative influence on the urban fabric of the area.

10.11 CONCLUSION

This assessment has considered both the Landscape / Townscape impacts of the proposed development as well as its visual impact. This assessment compares the proposed development to both the existing baseline environment and the previously permitted scheme on site.

In terms of Landscape / Townscape impacts it is considered that the proposed development will not result in a marked increase in the intensity and scale of the development when compared to the previously permitted scheme on site. Critically it will not push a threshold whereby the development appears over-scaled or inappropriate to the surrounding urban fabric, which already contains substantial scale institutional facilities such as a Hospitals, Nursing Homes and schools closely aligned to major north city transport routes. Thus, the significance of Landscape / Townscape impact is deemed to be Moderate and Positive relative to the current brownfield scenario and the effects of the proposed development Slight-imperceptible relative to the extant permission.

Nine viewpoints were used for the purposes of the visual impact assessment with verifiable views prepared for each of them. In several instances, the proposed development is not readily visible from the particular viewpoint and the significance is Imperceptible by default (VP3, VP4, VP7). In the case of VP6, which is relatively close to the eastern side of the development, the only visible block is Block F.

For the remaining viewpoints (VP1, VP2, VP2a, VP3a and VP5) the significance of visual impact is deemed to be Slight-imperceptible for very similar reasons in each case. These include only a very minor increase in the scale and intensity of the permitted development from the proposed additional upper levels. A change that although perceptible has little material consequence for visual amenity or a sense of scale conflict and/or overbearing relative to the previously permitted development or in its own right.

10.12 OVERALL SIGNIFICANCE OF IMPACT

Overall, it is considered that the proposed development is of an appropriate scale to its receiving environment and will not result in significant and negative impact once complete. Instead, the contribution of the proposed development is deemed to be a positive one in the context of the urban fabric of this area.

11 TRAFFIC AND TRANSPORTATION

11.1 INTRODUCTION

This Chapter of the EIA has been prepared by AECOM Ltd with input from the project team. The chapter describes the transportation impacts of the proposed development in accordance with the requirements of the relevant EIA legislation and guidance on preparation and content of an EIA. Figure 11.1, overleaf, illustrates the proposed development application site.

Staff who have prepared, verified, and authorised this Chapter alongside their relevant qualifications and experience are listed in Table 11-1

Quality Information	Qualifications	Experience
Prepared by: Patrick McGeough Traffic Planner / Engineer	MEng, MICE ¹	Patrick has been working in the development planning sector for over Four years. His experience is supported by a MEng (Hons) in Civil Engineering. Patrick is involved with all aspects of traffic and transportation projects, including communications with the client and wider design teams, preparation of traffic data (AADT ²) for use by other disciplines, undertaking detailed junction modelling analysis using Junctions 9 and LinSig software and preparation and checking of final reports to be issued for planning applications. Relevant project experience includes: Two Oaks Scholarstown SHD ³ ; Dublin; Clonburriss SDZ, Dublin; Capdoo SHD, Kildare.
Verified & Approved by: Tim Robinson Regional Director	BSc(Hons), (Engineering), MCIHT ⁴	MSc Tim Robinson is a Transport Planner with over 35 years' experience. His experience is supported by a MSc (Engineering) degree in Transport from Imperial College, London. Tim's focus of work has always been in the development planning space, seeking consents for a variety of public and private sector clients. The majority of Tim's work involves transport assessment and traffic & transport input to EIA's. Tim prepares input to numerous such deliverables every year across the island of Ireland. Relevant project experience includes: North South Interconnector, various windfarm projects, as well retail development and mixed use residential development schemes. Tim has lectured to peers on transportation and has been chair of his local branch of CIHT. Tim is an AECOM approved Lead Verifier for Transport Assessment and appraisal projects.

Table 11-1 Statement of Competency

¹ MICEI – Member of the Institute of Civil Engineers
² AADT – Average Annual Daily Traffic



Figure 11-1 Application Site Location

This chapter sets out the existing receiving environment in terms of road conditions, traffic activity and transportation accessibility, the proposed development in terms of construction traffic impact on the receiving environment and any necessary mitigation measures.

As set out within this EIA, the proposed development is intended to facilitate the future delivery of the residential development and this Chapter therefore describes the impacts arising from the construction and operation of the Hartfield Place SHD on the proposed development.

11.2 METHODOLOGY

The methodology adopted for this chapter can be summarised as follows:

- Trip Generation – The client and project team provided information relating to the anticipated volume of traffic associated with the proposed development and intended SHD during construction (where construction phases may overlap). The TRICS version 7.7.2 database was used to determine vehicle trips associated with the operation of the SHD.
- Existing Transport Infrastructure – AECOM has collated information on the existing and proposed transport network in vicinity of the application site using online publicly available sources and the outcomes of a site visit.
- Existing Traffic Flow Assessment – The traffic surveys (weekday classified junction turning counts) were conducted by an independent survey company, IDASO over a 12-hr survey period from 07:00 – 19:00 on Thursday the 3rd of October 2019.

³ SHD – Strategic Housing Development

⁴ CIHT – Chartered Institution of Highways and Transportation

- Percentage Impact Assessment – The proposed development’s traffic impact on the local road network is assessed as a percentage change with and without development to determine any requirements for further analysis.
- Junction Impact Analysis – Road links shown to exceed the percentage impact threshold are subject to standalone junction modelling.
- Implications of the intended SHD – The operational impact of the SHD upon the proposed development is calculated, expressed as a measure of the capacity of the proposed development to accommodate future traffic flows as per TII Traffic and Transport Assessment Guidelines. Where there is a potential overlap in the construction programme for the proposed development and SHD this is also considered as a measure of the capacity of the proposed development to accommodate such traffic.

The following guidance, in addition to EIAR guidance described in Chapter 1, has been used to inform this chapter:

- Project Ireland 2040: National Planning Framework (Department of Housing, Planning and Local Government and Department of Public Expenditure and Reform, January 2019);
- National Development Plan 2018 – 2027 (Department of Public Expenditure and Reform, February 2018);
- Dublin City Development Plan (2016 – 2022);
- Greater Dublin Area (GDA) Cycle Network Plan (National Transport Authority, December 2013);
- National Cycle Manual (National Transport Authority, 2011);
- Design Manual for Urban Roads and Streets, DMURS (Department of Transport, Tourism and Sport, May 2019);
- DN-GEO-03060: Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated and compact grade separated junctions), (Transport Infrastructure Ireland (TII), June 2017);
- PE-PDV-02045: Traffic and Transport Assessment Guidelines (TII, May 2014); and
- Guidelines for Providing Journeys on Foot (The Institution of Highways & Transportation, 2000).

11.3 RECEIVING ENVIRONMENT

The proposed development consists of works on a site at Swords Road, Whitehall, Dublin 9. The site is bounded to the west by Swords Road, to the south by Highfield Hospital, to the north by vacant lands and GAA pitches and to the east by Beechlawm Nursing Home with residential development beyond.

Figure 11-2 shows the context of the application site with the surrounding environs.



Figure 11-2 Site Context

The subject lands are zoned ‘Z12’ within the Dublin City Development Plan (2016 – 2022) as illustrated within Figure 11.3. The zoning objective of lands zoned ‘Z12’ is as follows “To ensure the existing environmental amenities are protected in the predominantly residential future use of these lands”.

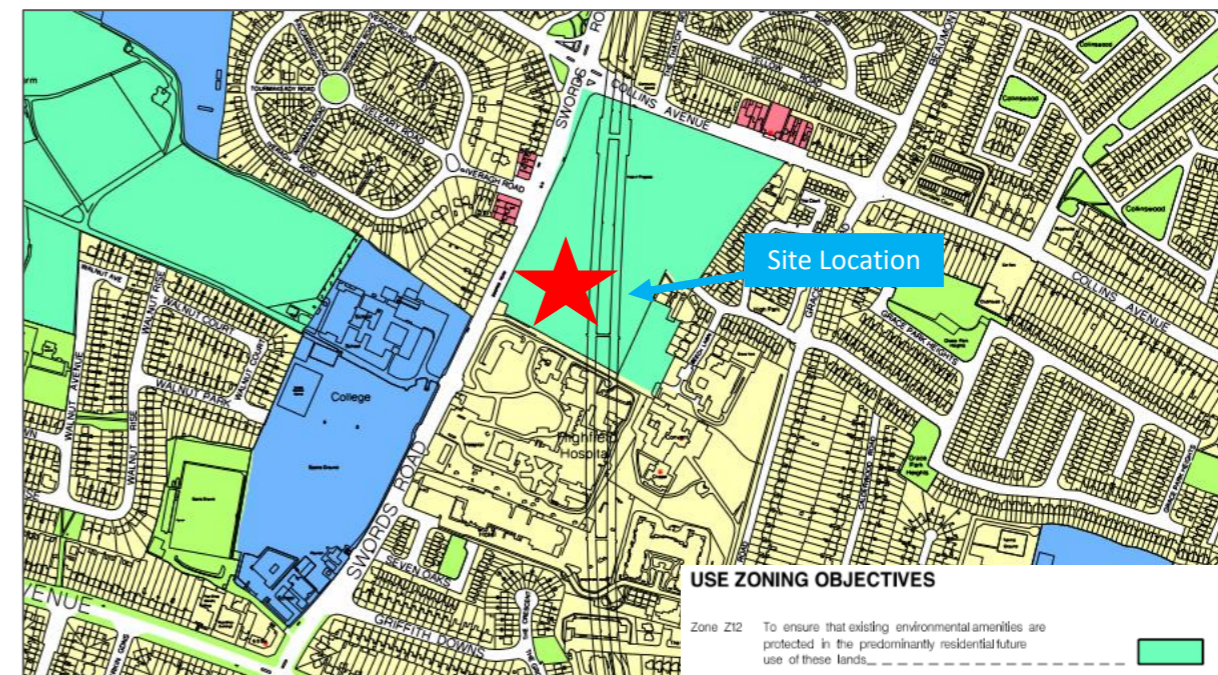


Figure 11.3 Land Use Zoning

Source: Dublin City Development Plan, 2016 – 2022

Swords Road (R132) is a regional two-way carriageway with 2 lanes running both north and southbound, with one lane dedicated for buses in each direction. The speed limit along the carriageway is 50 km/hr in the vicinity of the development. Footpaths are situated on both sides of the carriageway. An off-road cycle lane is provided on the western side of the carriageway, which transitions into an on road cycle lane along the approach of Iveragh Road.

Iveragh Road is a local road accessed off the Swords Road to the east and the R103 to the north, which leads to a residential housing development in Whitehall. Footpaths are provided along both sides of Iveragh Road with street lighting provided on both sides of the street, no dedicated cycling facilities are provided. The road is a one-way vehicle carriageway with a speed limit of 30 km/hr. There is a 3.5 tonne vehicular restriction at Iveragh Road. Figure 11.6 illustrates the existing cycle network in Whitehall, showing that the application site benefits from proximity to a number of routes.



Figure 11-4 N1 Northbound at site Access

Source: Google Maps



Figure 11-5 Iveragh Road Existing Arrangement

Source: Google Maps

To the north, Swords Road intersects with Collins Avenue West (R103), as part of an orbital route connecting Killester / Donnycarney with Whitehall, Ballymun, Glasnevin and Finglas. The existing junction at the Swords Road / Iveragh Road / Site Access junction consists of a signalised pedestrian crossing on the northern arm of the junction which is operated by pedestrians pressing the push button. A yellow box junction is provided to prohibit vehicles blocking vehicles exiting / entering the Iveragh Road.

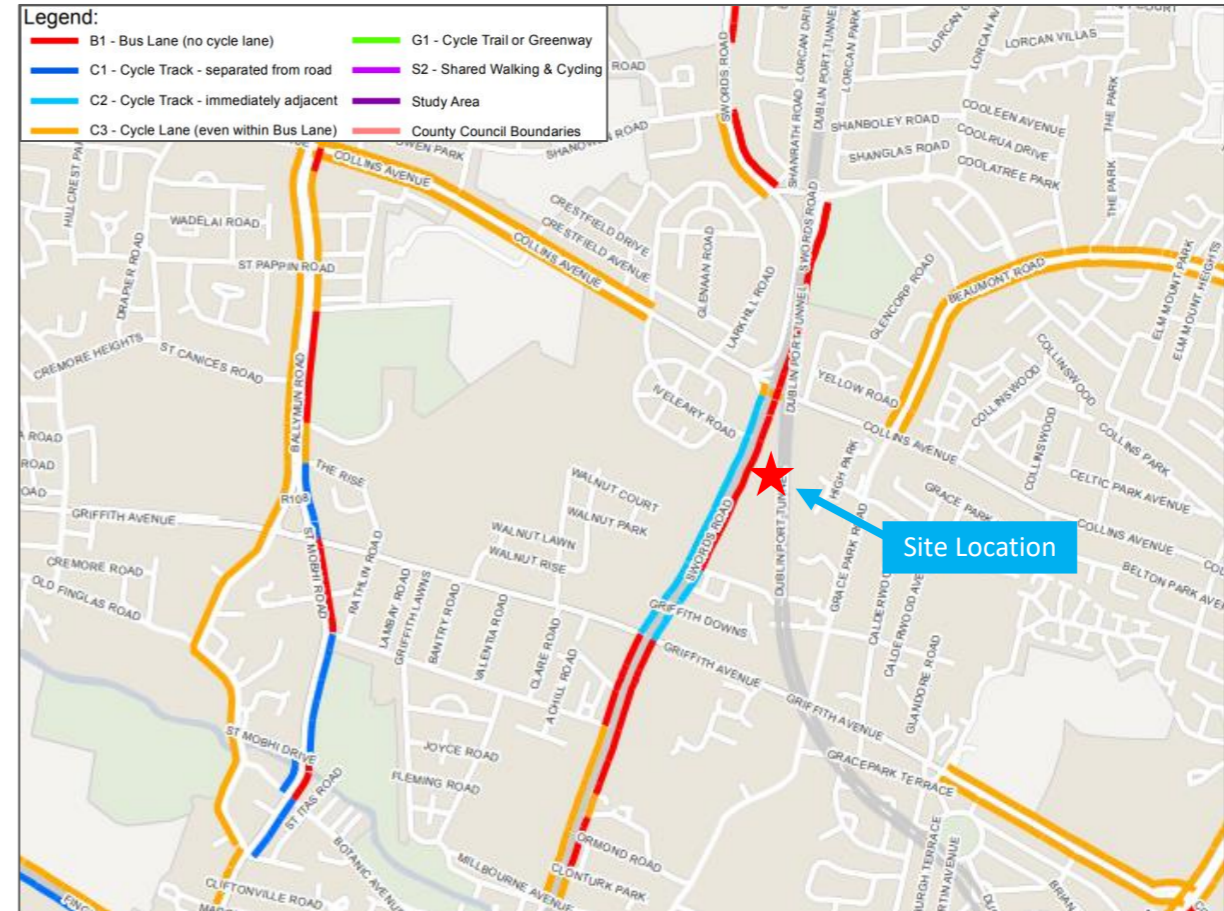


Figure 11-6 Existing Cycling Facilities

There are a number of bus stops which are within walking distance of the application site. Bus services in the area are run predominantly by DublinBus and see services connecting between Dublin City and further north towards Santry, Dublin Airport and Swords. Figure 11.7 illustrates key public transport infrastructure in vicinity of the application site.



Figure 11-7 Public Transport Infrastructure

The nearest bus stops from the site are along Swords Road which feature on road line markings and a sheltered bus stop with Real Time Information provided.

Table 11-2 provides an overview of the bus routes in Whitehall. In respect of journey time, on average it takes 20 minutes to get from Whitehall to Dublin City Centre via Public Transport.

Route No.	Service Provider	Route	No. of Services		
			Monday to Friday	Saturday	Sunday
1	Dublin Bus	Santry – Whitehall – Dublin City – Sandymount	Every 10 mins	Every 20 mins	
16	Dublin Bus	Dublin Airport – Whitehall – Drumcondra – Dublin City - Ballinteer	Every 10 to 15 mins		
16c	Dublin Bus	Dublin Airport – Santry – Whitehall – Ballybough – Dublin City	3 services per day (From 23:00 – 23:30)		
33	Dublin Bus	Dublin City – Drumcondra – Whitehall – Dublin Airport – Swords – Lusk – Balbriggan	1 service every hour		
41	Dublin Bus	Dublin City – Drumcondra – Whitehall – Dublin Airport – Swords – Knocksedan	Every 20 mins	Every 30 mins	Every 20 mins
41b	Dublin Bus	Dublin City – Drumcondra – Whitehall – Dublin Airport – Swords – Rowlestown	5 services per day	4 services per day	3 services per day

Table 11-2 Bus Timetables and Routes

The closest railway station to the application site is Drumcondra Train Station, located 2.2km to the south-west of the site. Drumcondra Train Station is situated along the Maynooth Line, Sligo/Longford Service and the M3 Parkway service which offers heavy rail services south to Dublin Connolly and West to Maynooth.

There are a number of GoCar hire stations located within the site’s local area, but the two closest sites are located along Collins Avenue and on Iveragh Road near Collins Avenue West, both within 400m walking distance of the subject site. GoCar members can book cars online or via the app for durations of as little as an hour. They then unlock the car with their phone or a GoCard; the keys are in the car, with fuel, insurance and city parking all included.

A review of the Road Safety Authority (RSA) traffic collision database has been undertaken for the road network in the vicinity of the subject site to identify any collision trends. This review will assist to identify any potential safety concerns in relation to the existing road network.

Traffic collision data was obtained for the period 2005 – 2016, which is the most recent data available from the RSA website. It should be noted that information relating to report incidents for the years 2017, 2018, 2019 and 2020 is not yet available on the RSA website. The RSA records detail only those occasions where the incident was officially recorded such as the Garda being present to formally record details of the incident.

The incidents are categorised into class of severity, which includes minor, serious and fatal collisions. The collision locations are shown in Figure 11.8 below.

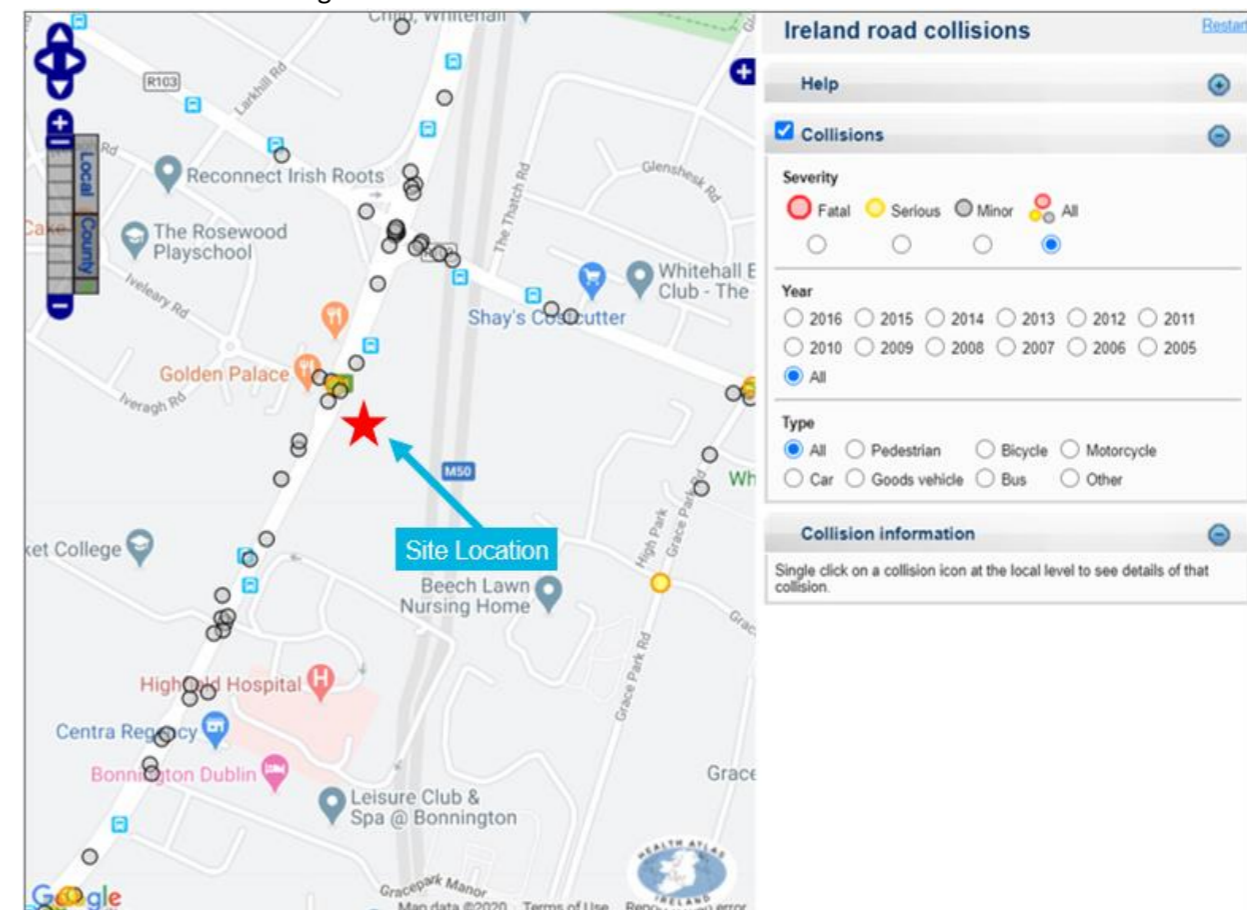


Figure 11-8 Road Collisions

Source: www.rsa.ie

Upon inspection there has been 5 no. collisions recorded along the Swords Road in the vicinity of the subject site. Of the five collisions, one collision was recorded as a serious collision which involved a cyclist in 2016 and the remaining incidents were all minor in nature. It should be noted that the four minor incidents all occurred before 2011. The collisions do not indicate any reoccurring collision hotspots or traffic concerns with the existing road network and it is anticipated that the formalisation of this junction to full signal control provides a safety benefit for existing users.

11.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Refer to Chapter 3 of this EIAR for a full description of the proposed development, a summary is provided below.

The proposed development comprises 472 no. residential apartments, comprising of the following breakdown:

- 32 no. studio apartments;
- 198 no. 1-bedroom apartments;
- 233 no. 2-bedroom apartments; and
- 9 no. 3-bedroom apartments.

In addition, the scheme includes for a crèche (446 sqm) and café (99 sqm). As part of the scheme, it is proposed to provide 340 car parking spaces and 968 cycle parking spaces (732 for residents and 236 for visitors). In respect of the proposed site access arrangements, AECOM have engaged with Dublin City Council (DCC) and the National Transport Authority (NTA) to confirm the junction layout arrangement which would not impede the delivery of the future BusConnects scheme along the Swords Road, Core Bus Corridor 2. Swords to City Centre.

Subject to consent construction of the proposed development could commence in 2023 with anticipated completion by 2026 equating to a three-year programme. Post 2026 the scheme would be opened and is assumed to be fully occupied hence the trip generations reflect the development when operational.

In terms of construction traffic generated it is anticipated that for the average working day there will be 45 daily on-site staff, and over the course of the construction period total of 6,000 truck loads for deliveries which is anticipated to be 5,000 loads of exported material and 1,000 loads of imported material during the construction period.

The following are the assumptions that have been made with respect to the construction impact of the proposed development, which AECOM believe will present the worst-case scenario for assessment purposes:

- All deliveries (imports / exports) will arrive / depart from the M1 Junction 2 (see Figure 11.2);
- A maximum of 110 no. construction staff anticipated on site and will arrive and depart via their own vehicle (i.e., no car share);
- 36-month work period, equates to 750 days that deliveries could occur (weekdays only);
- The peak hours for the construction phase will occur between 08:00 – 09:00 and 17:00 – 18:00 – this is robust as it coincides with the peaks in local network traffic and may not be reflective of actual patterns as these will be agreed with DCC as part of the Construction Management Plan (CMP) which will include a Construction Traffic Management Plan (CTMP);
- Uniform arrival and departure rates for material exported from the site; and
- All imported material will arrive and depart during the morning peak.

This equates to a total of 52 no. vehicles during the morning peak (45 no. staff arrivals and 7 no. deliveries) and 51 no. vehicles during the evening peak (45 no. staff departures and 6 no. delivery). This traffic has been used to assess the impact of the construction of the proposed development on the receiving environment.

11.5 POTENTIAL IMPACTS

Construction Traffic Impacts

The construction of the proposed development is anticipated to generate the following vehicle movements during the morning and evening peak periods:

Morning Peak:

- 45 No. construction staff arrivals
- 1 No. load of imported material (Arrives and departs)
- 7 No. load of exported material (Arrives and departs)

Evening Peak:

- 45 No. construction staff depart
- 7 No. load of exported material (Arrives and departs)

The traffic route of proposed development construction traffic is summarised as follows:

- All deliveries (imported and exported material) will arrive and depart via the R132 from the M1 Junction 2;
- Construction Staff will arrive and depart in accordance with existing surveyed traffic movements.
- 54% of construction staff will arrive via the M1 Junction 2 direction during the morning peak;
- 46% of construction staff will arrive via the R132 south direction during the morning;
- 50% of construction staff will depart via the M1 Junction 2 direction during the evening peak; and
- 50% of construction staff will depart via the R132 south direction during the evening peak.

Staff distribution is shown in Figure 11.9 with the delivery distribution illustrated in Figure 11.10.

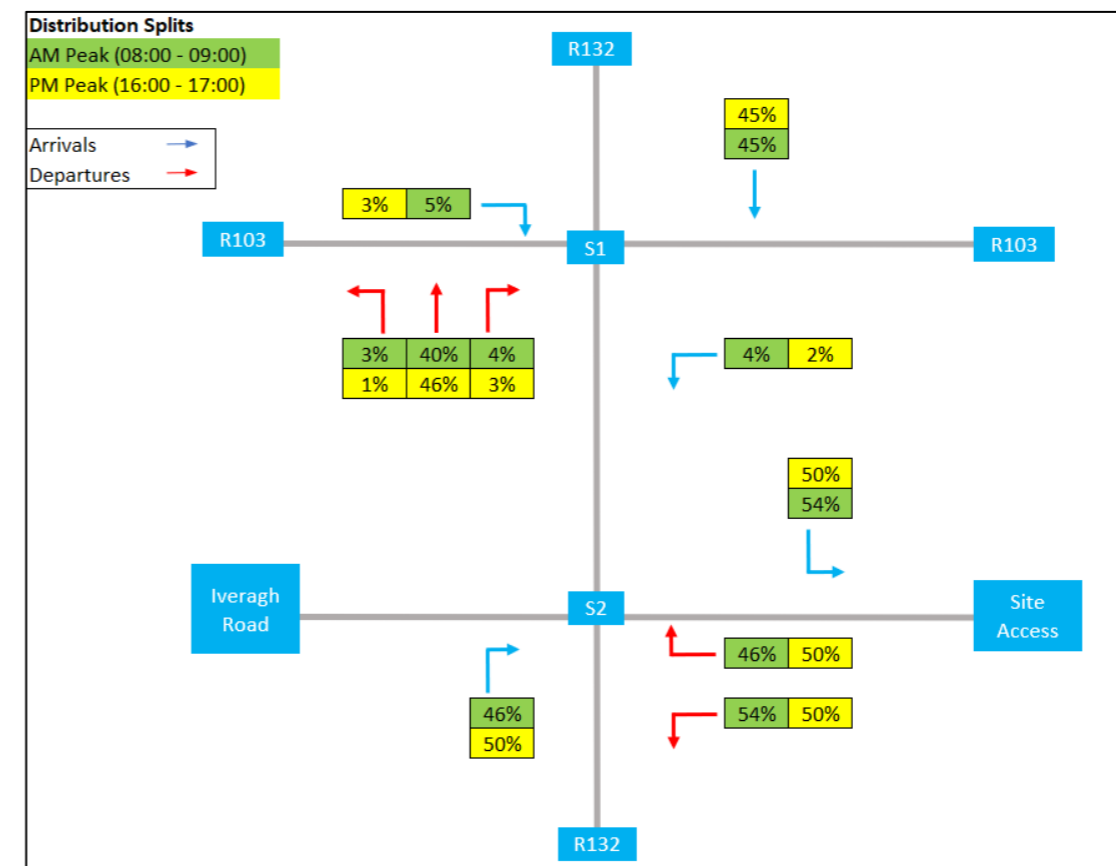


Figure 11-9 Staff Trip Distribution

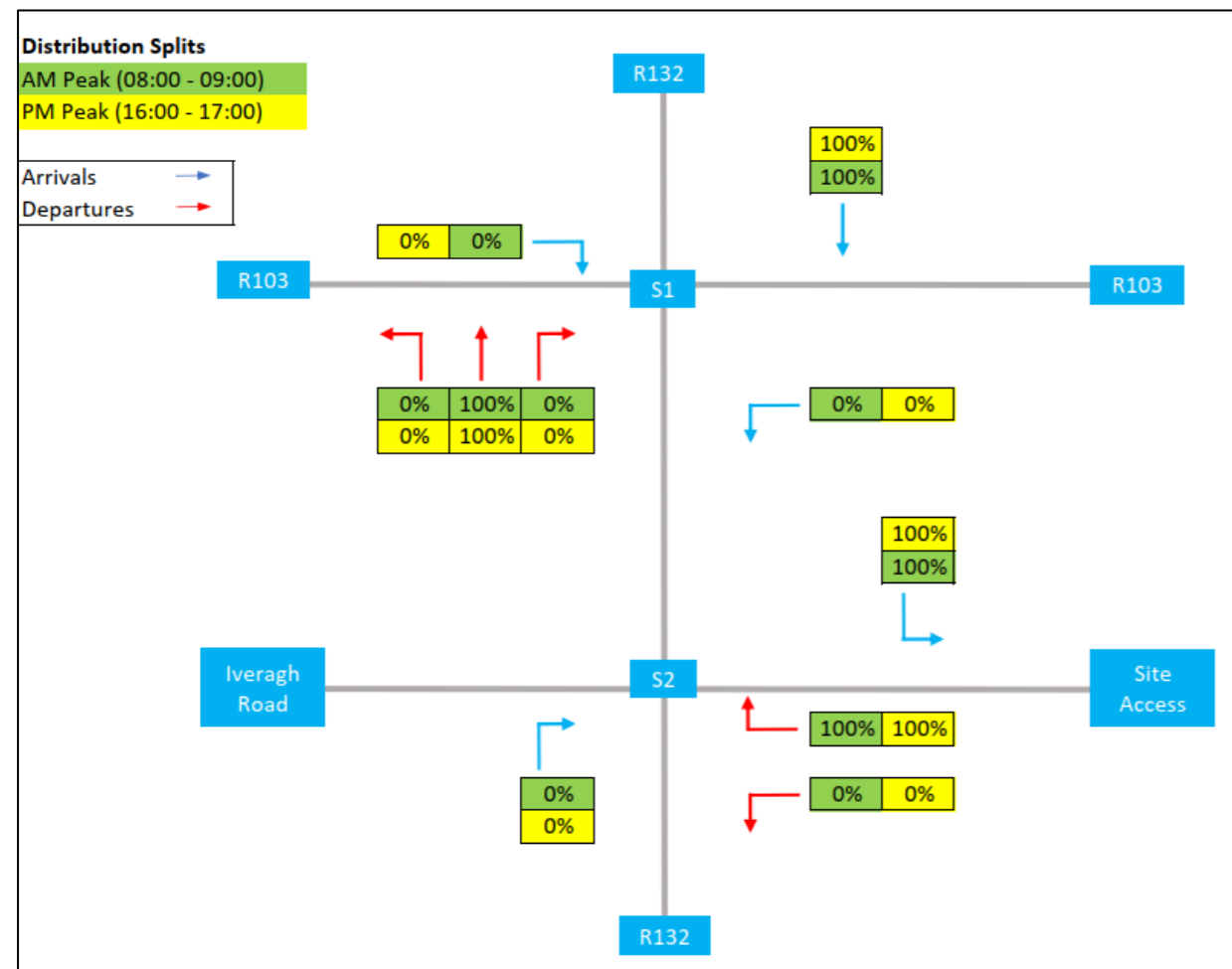


Figure 11-10 Delivery Vehicle Trip Distribution

The Transport Infrastructure Ireland (TII) ‘Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (May 2019)’ sets out growth rates for forecasting future year traffic for use in scheme modelling and appraisal. It is noted that in respect of Swords Road, which is in the ‘Dublin Metropolitan Area’, the growth during the period 2016 – 2030 is set at 1.62% per annum for Low Growth, reducing to 0.51% per annum from 2030 – 2040 (LV rates used). Thus the growth factor from the traffic survey collection date to year of opening is as follows:

- 2019 to 2023 – 1.0664 (or 6.64%);

The TII Guidelines for Transport Assessments state that the thresholds for junction analysis in Transport Assessments are as follows:

- ‘Traffic to and from the development exceeds 10% of the existing two-way traffic flow on the adjoining highway.
- Traffic to and from the development exceeds 5% of the existing two-way flow on the adjoining highway, where traffic congestion exists or will exist within the assessment period or in other sensitive locations.’

A comparison was made between the pre-development and operational scenario, to identify the percentage impact of the development.

The projected percentage impact of the construction traffic on the surrounding road junctions during the opening year (2026) is set out in Table 11-3 and shown in Figure 11.11.

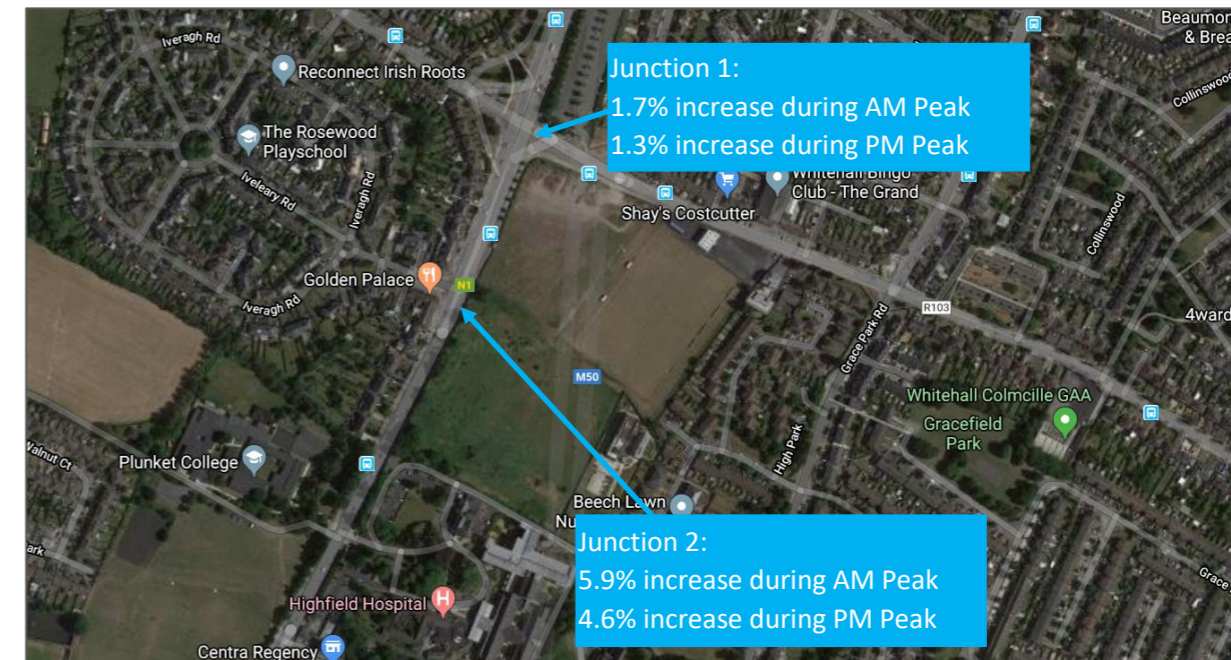


Figure 11-11 Percentage Impact at Junctions – Construction of Proposed Development

Opening Year	Junction	Time Period	Existing Flows	Proposed Flows	% Impact
2023	Site 1 - Swords Road / Collins Avenue West	AM	4111	120	2.9%
		PM	4252	112	2.6%
	Site 2 - Swords Road / Iveragh Road / Site Access	AM	2368	222	9.4%
		PM	2332	222	9.5%

Table 11-3 Percentage Impact Analysis – Construction of Proposed Development

The Construction impacts have been assumed on the basis of the worst possible construction impact that could be observed for the construction traffic from the proposed development, using the max of 110 construction staff and 8HGV deliveries per day. In practice, it is expected that only 45no construction staff trips are made on a daily basis and the day to day impact would be significantly lower than that of the worst case scenario.

The percentage impact of the proposed development at Site 1 is within the 5% threshold and therefore analysis has not been undertaken on this signal-controlled junction.

Operational Phase

The projected percentage impact of the operational traffic on the surrounding road junctions during the opening year (2026) is set out in Table 11-4

Opening Year	Junction	Time Period	Existing Flows	Proposed Flows	% Impact
2026	Site 1 - Swords Road / Collins Avenue West	AM	4314	61	1.4%

	Site 2 - Swords Road / Iveragh Road / Site Access	PM	4462	52	1.2%
		AM	2485	140	5.6%
		PM	2447	108	4.4%

Table 11-4 Percentage Impact Analysis – Operation of Proposed Development

The percentage impact of the construction phase will result in an impact of:

- 1.4% and 1.2% upon Junction 1 Swords Road / Collins Avenue in the respective morning and evening peaks.
- 5.6% and 4.4% upon Swords Road / Iveragh Road / Site Access in the respective morning and evening peaks.

The percentage impact of the proposed development at Site 2 marginally exceeds 5% during the morning peak hour by 0.6%. In the evening peak the impact is less than 5%. As a new junction type is proposed at this Site further junction modelling analysis is required to be undertaken as per TII Guidelines for Transport Assessments and to confirm the suitability of the access arrangement at Site 2. An assessment has therefore been undertaken utilising the TII approved modelling package, LinSig, on this signal-controlled junction, the results of which are provided below.

LinSig is an industry standard software used to model the capacity and queuing of signalised junctions. The meaning of the acronyms used within the capacity assessment results are discussed below.

- DoS DoS (for signal controlled junctions)
- Q Queue length (PCU's)
- PRC Practical Reserve Capacity (for signal controlled junctions)

It is generally accepted that DoS values of 90% and less are indicators that a junction is operating within capacity. Although a junction would be said to be operating at capacity at values of 100%, the use of 90% allows for a margin of error and fluctuations in traffic flows. Junctions are therefore only identified as operating over capacity if these values are exceeded.

PRC is a term used to denote the maximum desirable flow through a signalised junction and 0% PRC is reached when one or more of the approaches to the junction are operating at 90% of their capacity. Therefore, it should be recognised that the actual maximum limit for a signalised junction is -10% PRC and a junction would therefore be considered to be operating within its maximum capacity with a PRC value of -9.99%.

With regard to the above, it is noted that DMURS acknowledges that the above thresholds cannot always be achieved in urban areas and that "In areas ...such as in Neighbourhoods and Centres...junctions may have to operate at saturation levels for short periods..."

The Swords Road southbound and the Iveragh Road lanes both experience high levels of demand at peak times. This junction at present is not fully signalised, as the current junction operates akin to a priority-controlled junction with a signalised pedestrian crossing being provided on the northern arm which is operated by push button unit. As illustrated in Table 11-3 and Table 11-4 above, there is currently over 2,000 vehicles travelling northbound and southbound along the Swords Road during the peak periods.

Analysis was completed for Opening Year of 2026, Opening Year +5 of 2031 and Opening Year + 15 of 2041. The results are synopsised in Table 11-5, Table 11-6 and Table 11-7, respectively.

Arm	2026 AM With Dev	
	DoS %	MMQ
Swords Road Southbound Left Ahead Right	101.2%	86.8
Site Access Left Ahead Right	80.9%	6.2
Swords Road Northbound Right Left Ahead	87.3%	37.6
Iveragh Road Ahead Right Left	101.3%	10.8
Arm	2026 PM With Dev	
R132 Swords Road North Left Ahead Right	96.0%	58.1
Site Access Right Left Ahead	35.1%	1.9
R132 Swords Road South Ahead Right Left	92.1%	46.9
Iveragh Road Left Ahead Right	74.6%	4.4

Table 11-5 Percentage Impact Analysis– 2026 With Development LinSig Analysis

Arm	2031 AM With Dev	
	DoS %	MMQ
Swords Road Southbound Left Ahead Right	109.6%	154.9
Site Access Left Ahead Right	80.9%	6.2
Swords Road Northbound Right Left Ahead	94.5%	51.4
Iveragh Road Ahead Right Left	109.3%	15.5
Arm	2031 PM With Dev	
R132 Swords Road North Left Ahead Right	103.9%	103.1
Site Access Right Left Ahead	35.1%	2.0
R132 Swords Road South Ahead Right Left	99.7%	72.5
Iveragh Road Left Ahead Right	80.1%	5.2

Table 11-6 Percentage Impact Analysis– 2031 With Development LinSig Analysis

Arm	2041 AM With Dev	
	DoS %	MMQ
Swords Road Southbound Left Ahead Right	112.6%	171.4
Site Access Left Ahead Right	80.9%	5.5
Swords Road Northbound Right Left Ahead	97.0%	59.1
Iveragh Road Ahead Right Left	112.8%	17.0
Arm	2041 PM With Dev	
R132 Swords Road North Left Ahead Right	101.9%	102.2
Site Access Right Left Ahead	39.7%	2.3
R132 Swords Road South Ahead Right Left	98.3%	73.8
Iveragh Road Left Ahead Right	92.5%	7.4

Table 11-7 Percentage Impact Analysis– 2041 With Development LinSig Analysis

The LinSig analysis indicates that the proposed signalised junction will operate within capacity for the opening year (2026) and is at capacity during the Opening Year + 5 (2031) morning Peak and Opening Year + 15 (2041) with the development in place. The development generates a low level impact on the road network in comparison to the baseline traffic along Swords Road, and represents an overall reduction in traffic generated to that of the previously permitted development scheme for 358 units (ABP Reg Ref: PL 29N.238685, DCC Reg Ref: 3269/10) on

the site, due to the reduction in vehicular parking and increased emphasis on sustainable modes of traffic and improved infrastructure for sustainable modes of transport and the improvements to bus services and infrastructure through BusConnects.

The introduction of a signalised junction at this location will formalise the road network and provide a net benefit to pedestrians, cyclists and motorists by providing dedicated crossing facilities on all arms of the Swords Road / Iveragh Road / Site Access junction ensuring that permeability is provided while also ensuring that the scheme does not comprise the BusConnects proposals at this location.

It is acknowledged that this junction will experience queuing and delays at peak times but this is due to the large volumes of traffic already travelling along the Swords Road during the morning and evening peak periods.

11.6 POTENTIAL CUMULATIVE IMPACTS

Cumulative traffic impacts may arise where there are a number of existing or proposed developments, that will affect, in traffic terms, this development and the traffic flows surrounding it. The potential cumulative effects in the context of traffic have been included in the overall assessment as traffic associated with development proposals and background growth have been included in the traffic forecasts and subsequent analysis included in this chapter.

11.7 MITIGATION MEASURES

The assessment of potential traffic impacts concludes that the construction of the proposed development is not anticipated to impact the operational performance of the local road network therefore no mitigating measures are necessary in this respect. It is however good practice to prepare a CTMP for a project akin to the proposed development which sets out steps to manage construction traffic. The Outline CEMP for the proposed development sets out such measures. A detailed CTMP will subsequently be prepared by the appointed contractor which will be agreed with DCC and which will provide for the implementation of traffic management measures.

Construction Phase

Construction debris particularly site clearance, spoil removal and dirty water run off can have a significant impact on footpaths and roads adjoining a construction site, if not adequately dealt with and these matters will require to be fully addressed in the contractor's CTMP, typically this includes wheel wash facilities at the site for egressing traffic and also external site road sweeping.

Operational Phase

In order to ameliorate the operational impacts of the proposed development, this application provides a reduced parking provision to that of the extant permission onsite, thus a reduction in expected vehicle trips would be resultant. The reduction of car parking spaces is proposed to reduce the on-site residents' car ownership and therefore the expected impacts on the AM and PM peak period trips.

A Mobility Management Plan and Parking Strategy have been prepared alongside this application to manage and mitigate the impacts of private vehicle usage and promote sustainable travel trends to and from the proposed development.

Further to this, the proposed complete signalisation of the N1/Iveragh Road/Site Access junction should allow for greater safety in pedestrian crossing of all arms of the road, as existing pedestrian crossings at Iveragh Road are provided as drop kerb crossing points and only one crossing point is provided along the N1 at the existing signals.

11.8 PREDICTED IMPACTS

Construction Phase

The development during construction is anticipated as generating a low level impact on the road network in comparison to the baseline traffic and with the preparation of a detailed CMP to manage construction traffic no residual impacts are anticipated.

Operational Phase

The development once constructed is anticipated as generating a low level impact on the road network in comparison to the baseline traffic and with the preparation of a Car Parking Strategy, Mobility Management Plan and Site Servicing and Operation Plan managing traffic and transportation impacts.

11.9 DO NOTHING SCENARIO

If the proposed development does not take place, the surrounding road network will remain in its current conditions. Background traffic growth is however, anticipated on the surrounding road network as indicated with the TII Travel Demand Projections for Dublin.

11.10 WORST CASE SCENARIO

The traffic and transport impacts have been undertaken for the worst case periods. In terms of construction traffic the impacts have been assessed both in the morning and evening peaks – when construction staff traffic generations are highest and in the off peak when deliveries of construction materials are at their highest. Post construction, the operational impacts have been assessed during the morning and evening peaks which represent the worst case traffic periods as they are the busiest times of the day for both background traffic and development traffic.

11.11 MONITORING AND REINSTATEMENT

As low traffic impacts are anticipated on the performance of the local road network no monitoring is necessary. The CTMP element of the CMP will provide the mechanism to monitor the appointed contractor's adherence to traffic management measures.

11.12 DIFFICULTIES IN COMPILING INFORMATION

No difficulties were encountered in compiling this chapter of the EIAR.

11.13 REFERENCES

The following guidance, in addition to EIAR guidance described earlier, has been used to inform this chapter:

- Project Ireland 2040: National Planning Framework (Department of Housing, Planning and Local Government and Department of Public Expenditure and Reform, January 2019);

- National Development Plan 2018 – 2027 (Department of Public Expenditure and Reform, February 2018);
- Dublin City Development Plan (2016 – 2022);
- Greater Dublin Area (GDA) Cycle Network Plan (National Transport Authority, December 2013);
- National Cycle Manual (National Transport Authority, 2011);
- Design Manual for Urban Roads and Streets, DMURS (Department of Transport, Tourism and Sport, May 2019);
- DN-GEO-03060: Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated and compact grade separated junctions), (Transport Infrastructure Ireland (TII), June 2017);
- PE-PDV-02045: Traffic and Transport Assessment Guidelines (TII, May 2014); and
- Guidelines for Providing Journeys on Foot (The Institution of Highways & Transportation, 2000).

12 MATERIAL ASSETS

12.1 INTRODUCTION

This section evaluates the impacts of the proposed development on the existing services and material assets of the subject site and its surroundings. Material assets discussed here are in relation to the impact of the built services and infrastructure belonging to the subject site. Traffic and transportation are assessed separately in this EIAR.

12.2 METHODOLOGY

A desktop study was conducted in relation to the material assets associated with the proposed development and their capacities. Projections of the resources were made for the construction and operational phase of the development. The Guidelines on information to be contained in an Environment Impact Statement (EPA 2002), the advice notes on current practice and Draft EPA guidelines published in 2017 requires assessment of 'economic assets of human origin' to be included in the impact study as a desktop study of material assets associated with the development.

The impacts are assessed in terms of their scale, duration and significance to the site context. Construction phase impacts are assessed on the impact of the proposal likelihood in incurring loss or disturbance to material assets due to construction activities. Economic assets of natural origin that includes biodiversity, soil and water are addressed specifically in chapters 5, 6 and 7.

12.3 RECEIVING ENVIRONMENT

Built Environment

The subject site is located within Dublin City Council administrative area. The development site is located along the Swords Road (R132), Dublin 9. The western side of the site fronts onto the Swords Road and the site is accessed from this location. Highfield Hospital is to the immediate south, also fronting onto the Swords Road.

There are vacant lands owned by Dublin City Council and Whitehall GAA pitches to the north of the site, facing onto the Swords Road and Collins Avenue. Beech Lawn Nursing home is located to the rear (east) of the site, accessed from Grace Park Road via High Park.

To the northern boundary of the site there is the Whitehall GAA pitch and its associated facilities, to the north east and east is Beech lawn Nursing home, and to the south Highfield Hospital Alzheimer's care centre and mental health centre.

On the western boundary of the site is the Swords Road, a wide north-south artery into Dublin City which features Quality Bus corridors and part-segregated cycle lanes. Directly across the Swords Road from the subject site is a strip of neighbourhood level mixed-use activities. Similarly, to the north of the site on Collins Avenue, a 5-minute walk, is another neighbourhood level centre for the Whitehall area.

The Dublin Port Tunnel runs beneath a portion of the subject site. Block F of the proposed development is located partially above the tunnel while Block G is located directly above the tunnel. The site formed part of the accommodation works for the construction of the Dublin Port Tunnel and the tunnel is located beneath the site on a line north/south.

A Tunnel Impact Assessment (prepared by AGL Consulting Engineers) confirms that the construction of the proposed development does not exceed the surcharge limit on the tunnels and will have no detrimental impact on the lining of the tunnel.

Water Supply

There is an existing 300mm asbestos watermain located in Swords road, to the west of the subject site. Irish Water confirmed that due to the condition of the asbestos watermain it is not possible to provide a connection to it to supply the subject site. To the north of the site, in Collins Avenue, there is an existing 300mm ductile iron watermain. To the east of the site, in High Park, there is an existing 100mm watermain, which is connected to an 150mm watermain in Grace Park Road.

Foul Drainage

The existing foul network in Swords Road has currently no available capacity for future developments. It was determined that the existing foul pumping station, Santry WWPS, is discharging via a rising foul main, into the Swords road foul main as the Santry WWPS is overloaded. It is not due upgrade works for the foreseeable future. Also the existing combined sewer that is in the neighbouring housing development called Iveleary Gardens, (opposite the site – West of Swords Road) discharges into the Swords road foul main which results in the existing foul main becoming surcharged during peak rainfall events. As a result of this, Irish Water have directed the development to discharge all foul sewers to the existing High Park foul main, which connects to the Grace Park road foul main.

Surface Water Drainage

There are no public surface water drainage within the subject site. There is an existing 300mm surface water pipe located in Swords Road to the west of the subject site. This surface water main gravitates southwards, along the N1 road, increasing in size to a 600mm diameter pipe at Griffith Avenue and discharges in to the Tolka River. There is an existing 300mm diameter concrete surface water main located in the public road in High Park, to the east of the subject site. This gravitates towards Grace Park road and discharges into a 600mm diameter concrete pipe. The surface water main in Grace Park road gravitates southwards towards the Tolka River.

Telecommunications, Natural Gas and Electricity Supply

Utility record information on the existing infrastructure were obtained from the following:

- Irish Water;
- Electricity Supply Board Networks (ESB);
- Gas Networks Ireland;
- Telecommunications Network

A desk study of records received in digital format from the various utility companies/authorities, survey information and supplementary sources was undertaken. Consultations with the utility companies/authorities were conducted in order to identify their particular requirements during construction and for permanent arrangements.

12.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will consist of the construction of 7 no. blocks in heights up to 8 storeys (over single level basement) comprising 472 no. apartment units, a creche, café unit, and internal residential amenity space. The proposal also includes car, cycle, and motorcycle parking, public and communal open spaces, landscaping, bin

stores, plant areas, substations, switch rooms, and all associated site development works and services provision. Access is provided from the development from Swords Road with associated upgrades to the existing public road and footpaths. A full description of the development is provided in the statutory notices and in Chapter 3 of the EIAR submitted with the application.

Surface Water Drainage

The proposed surface water system is the same to the previously approved system (DCC Reg. Ref.3269/10) in that it will consist of two separate networks with two different outfalls, containing surface water drainage, slung drainage, basement drainage, SUDS features and an underground attenuation system. The main difference is that the attenuation tanks will be concrete tanks and not stormbloc cells. The surface water network will connect to a new manhole which will be installed on the existing 300mm dia storm main in the Swords Road. The surface water outfall to Swords Road will have a discharge rate of 1.6l/s which is the same as the extant planning. The outfall discharging into the existing surface water main in High Park will connect into an existing manhole and will have a discharge rate of 4.0l/sec.

Foul Drainage

The original foul sewer layout which was approved in principle by Dublin City Council for DCC Ref. 3269/10 has been revised following discussions with Irish Water. Due to limited capacity in the public foul main in Swords Road, Irish Water have instructed to discharge the foul from the subject site into the existing public foul network in High Park housing estate which discharges into the existing foul main in Grace Park road. Upgrade works will be required on the Grace Park road foul main and the scope of these works will be determined by Irish Water.

Water Supply

The watermain layout for approved for DCC Reg. Ref 3269/10 shows two connections to existing watermains, one off the existing 100mm diameter watermain located in the Swords Road and the other off the existing 100mm diameter watermain located in the existing High Park Residential development. A 150mm diameter watermain loop between the two existing watermains was shown to serve the proposed development.

It was initially proposed to install the same watermain network layout in principle as per approved extant planning (DCC Reg. Ref 3269/10) but after a design review on the existing network by Irish Water it was identified that it wasn't an option to connect to the existing 300mm watermain located in Swords Road. Irish Water provided confirmation that the site is to be supplied water by a connection made to the existing 300mm ductile iron watermain located in Collins Ave, at the junction with Swords Road. This will involve installing approximately 180m of 200mm internal diameter watermain from Collins Avenue to the proposed developments site boundary on Swords Road. The proposed watermain layout involves the installation of a 200mm internal watermain from the connection point at the site boundary to a plant room located in the proposed basement underneath Block A. Each proposed apartment block will have its own individual supply from the proposed plant room. A proposed fire water ring main is to be installed around the site to supply proposed fire hydrants.

Telecommunications

Telecommunications supply, and the requirement for any alterations to the existing telecommunications network for the proposed development, will be agreed in advance of construction with the relevant telecommunications providers. All telecommunications related works will be carried out in accordance with relevant guidelines.

Natural Gas

Gas supply, and the requirement for any alterations to the existing gas supply network for the proposed development, will be agreed in advance of construction with Gas Networks Ireland. All gas supply related works will be carried out in accordance with Gas Networks Ireland relevant guidelines.

Electricity Supply

Electricity supply, and the requirement for any alterations to the existing power supply network for the proposed development will be agreed in advance of construction with ESB Networks. All power supply related works will be carried out in accordance with ESB Networks relevant guidelines.

12.5 POTENTIAL IMPACTS

The potential impacts of the proposed development are assessed below with respect to the impacts of the development during the construction and operational phase. The analysis takes into consideration the Characteristics of the receiving baseline environment and Characteristics of the proposed development.

Built Environment

Construction Phase

Potential impacts that may arise during the construction phase include:

- Contamination of surface water runoff due to construction activities.
- Improper discharge of foul drainage from contractor's compound.
- Damage to existing underground and over-ground infrastructure and possible contamination of the existing systems with construction related materials.
- Connections to existing ESB lines may lead to loss of connectivity to and / or interruption of supply from the electrical grid.
- Potential loss of connection to the Gas Networks Ireland and Telecommunications infrastructure while carrying out works to provide service connections.

Operational Phase

Potential operational phase impacts are noted below:

- Increased impermeable surface area will reduce local groundwater recharge and potentially increase surface water runoff if not attenuated to greenfield runoff rate.
- Fuel / oil leaks from parked vehicles;
- Increased foul loading on the existing network and Wastewater Treatment Plant
- Excessive demand on the watermain network resulting in reduced supply or loss of pressure in the surrounding area;
- Siltation of surface water drainage system and attenuation system

Water Supply, Foul and Surface Water

Construction Phase

The proposed development will require connection to the public water services network. This will result in a temporary suspension of the network to facilitate the connection, but which will be controlled and managed by Irish Water and Dublin County Council. The associated road works to facilitate the connections will also be controlled by these agencies in accordance with standard protocols. The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply.

The construction compound's potable water supply shall be located where it is protected from contamination by any construction activities or materials. These services will also be properly managed in accordance with the 'Construction and Environmental Management Plan' (CEMP) prepared by PUNCH and submitted with this application.

The water demand at the construction stage will be less than operational stage. Irish Water (IW) have confirmed feasibility of the demand for the operational stage. The effect of increased water demand during the construction stage when compared to the demand during the operational stage is likely to be neutral, imperceptible and short term.

Operational Phase

The proposed development will increase water demand on the water supply network and may lead to reduced pressure in the network if adequate supply is not available. Irish Water have provided confirmation of feasibility of supply which indicates that there is adequate capacity in the network. The operational impact of the proposed development is considered to be neutral, imperceptible, and long-term. T

he proposed development will increase the foul load on the existing network. Irish Water have provided confirmation of feasibility for foul discharge which indicates that there is adequate capacity in the network. The operational impact of the proposed development is considered to be neutral, imperceptible, and long-term.

The proposed development will increase the impermeable surface area and reduce groundwater recharge. The proposed SUDs features will promote groundwater recharge. The operational effect of the proposed development is considered to be neutral, imperceptible, and long-term.

Human Health

Accidental hydrocarbon leaks may occur on the proposed road and parking areas and subsequently discharge into the piped surface water drainage network and Tolka River.

From the perspective of the end user of the networks the risks to human health include:

- Contamination of potable water supply.
- Gas leaks or explosions. The installation of services is tightly monitored and controlled by Gas Networks Ireland to ensure the protection of human health. Therefore, the risk of effect on human health is not considered significant.
- Loss of supply. The connection of services is a managed process that is the responsibility of the individual utility supplier and emergency plans will be in place. The effect is therefore considered short term and not significant.

With the implementation of the mitigation measures outlined in Section 14.7, the impact of the proposed built services on human health is likely to be imperceptible.

Telecommunications, Natural Gas and Electricity Supply

Construction Phase

- Connections to existing ESB lines may lead to loss of connectivity to and / or interruption of supply from the electrical grid.
- Potential loss of connection to the Gas Networks Ireland and Telecommunications infrastructure while carrying out works to provide service connections.

Operational Phase

- There is existing trunk electrical, gas and telecoms networks in the area therefore the demand from the proposed development during the operational phase is considered to be neutral, imperceptible, and long-term.

12.6 POTENTIAL CUMULATIVE IMPACTS

Should any other developments be under construction or planned in the vicinity of the site, potential cumulative impacts may occur if similar mitigation measures are not implemented.

Cumulative impacts to material assets, during construction and demolition processes are associated with damage to existing infrastructure and contamination of water networks. Individual impacts from the Proposed Development are generally considered to be negligible to medium impacts to a low to medium sensitivity environment and the significance of the impacts has been assessed as imperceptible to moderate.

12.7 MITIGATION MEASURES

Construction Phase

Surface water, wastewater drainage and water supply for the proposed development is designed to comply with the Irish water code of practice, standard details, policies and guidelines and the requirements of Dublin County Council. Confirmation of feasibility for wastewater and water supply has been received from Irish Water see appendix 12.1.

Mitigation measures proposed in relation to the drainage and water infrastructure include the following:

- Adherence to the mitigation measures and monitoring set out in the Construction and Environmental Management Plan (CEMP) prepared by PUNCH Consulting Engineers and submitted with this application. Site inductions will include reference to the procedures and best practice as outlined in the Construction and Environmental Management Plan (CEMP).
- The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply.
- The construction compound's potable water supply shall be located where it is protected from contamination by any construction activities or materials.
- Identification of the location of services prior to excavation works commencing.
- Consultation with relevant services providers in advance of works to ensure works are carried out to relevant standards and specifications.
- Protection in place of all underground services for which diversions are not required.
- Consultation and agreement with Irish Water on allowable wastewater discharge to the public sewer network.
- Air testing of all new surface water and wastewater drainage lines
- Pressure testing of all new watermains lines
- All new foul drainage lines will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational.
- Electrical supply connections to the existing power supply network for the proposed development will be coordinated with ESB Networks. All power supply related works will be carried out in accordance with ESB Networks relevant guidelines.
- Gas supply, and the requirement for any alterations to the existing gas supply network for the proposed development, will be agreed in advance of construction with Gas Networks Ireland. All gas supply related works will be carried out in accordance with Gas Networks Ireland relevant guidelines.
- Connections to the telecommunications network for the proposed development will be coordinated with carried out in accordance with utility provider's guidelines.

During the construction phase of the proposed project, all possible provisions and precautions will be implemented in order to avoid disruptions to services in and surrounding the proposed site. These works will include coordination with the relevant utility and service providers in order to identify, as far as is possible, all

services within the proposed works area, prior to any excavation works being carried out. Disruption to services in the area will be kept to a minimum and will only occur where unavoidable, as advised by the relevant service provider. Prior notification of any planned disruptions shall be given to all impacted service users, including information as to when the disruptions are scheduled to occur and the duration of any service disruptions.

Operational Phase

All sustainable drainage systems will be either maintained by the applicant or, where taken in charge, by the local authority. Regular maintenance of the SuDS systems will maintain their function of treating surface water prior to discharge. This will prevent silt build-up and other contaminant discharge to the surface water network. Regular maintenance of the attenuation storage and flow control device will maintain controlled discharge of stormwater in rainfall events and prevent inundation of the surface water system. The site watermain system will be metered as directed by Irish Water to facilitate detection of leakage and prevent ongoing water loss. All new foul drainage lines will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational. On completion of the construction phase no further mitigation measures are proposed in relation to the electrical, gas and telecommunications infrastructure. Energy efficient appliances for lighting and heating will be installed to minimise electricity consumption where possible.

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 which will also reduce foul outflows. JOR Consulting Engineers have received a Confirmation of Feasibility from Irish Water for the proposed development confirming a future connection is feasible.

Cumulative Impacts

Each project currently permitted or under construction is subject to EIA and/or planning conditions which include appropriate mitigation measures to minimise effects on material assets. A currently permitted scheme in the surrounding area is PL29S.303358, which is an SHD proposing 112 no. units. This application received a grant of permission with conditions in April 2019.

In order to mitigate against cumulative effects any breaches of planning conditions or EIA adjacent to the Proposed Development that may give rise to negative cumulative impacts will be notified to the Local Authority.

Surface water drainage and foul drainage will be kept separate in the Proposed Development. Surface Water has two separate outfalls; one discharging to Swords Road and the other discharging to High Park while foul flows ultimately outflow to the High Park foul main. Foul drainage infrastructure will be designed and constructed to Irish Water Standards to minimise infiltration of groundwater to the network which will decrease foul flows. Water conservation measures such as dual flush water cisterns and low flow taps will be included in the design which will also reduce foul outflows. No further mitigation measures are practically possible to reduce the foul outflow from the proposed development and cumulative impacts on the High Park foul main. JOR Consulting Engineers have received a Confirmation of Feasibility from Irish Water for the proposed development confirming future water and wastewater connections are feasible.

12.8 PREDICTED IMPACTS

Construction Phase

Taking into account the above-mentioned mitigation measures, which are designed to avoid and prevent any adverse issues arising during construction, any predicted effects on the surface water, wastewater, water supply, telecommunications, natural gas and electricity supply services during the construction phase are considered to

be brief-temporary in nature and imperceptible, where supply is unavoidably disrupted to facilitate the construction phase.

Operational Phase

As surface water drainage, foul water drainage and watermain design has been carried out in accordance with the relevant guidelines and Irish Water have provided a Confirmation of Feasibility, the impacts are neutral, imperceptible and long term.

12.9 DO NOTHING SCENARIO

A 'Do nothing' scenario will result in the subject site remaining undeveloped with the remains of foundations present.

12.10 WORST CASE SCENARIO

Worst case scenarios for individual material assets are outlined in individual chapters of the EIA. In relation to power and telecommunications a worst case scenario would be where the works involved during construction resulted in an extended outage for existing properties in the area due to unforeseen delays on site.

12.11 MONITORING AND REINSTATEMENT

No monitoring is required in addition to those specifically noted in other chapters of the EIA.

12.12 DIFFICULTIES IN COMPILING INFORMATION

There were no significant difficulties in compiling the information.

12.13 REFERENCES

Not applicable.

13 WASTE MANAGEMENT

13.1 INTRODUCTION

This section addresses the subject of waste management for the proposed residential scheme at Swords Road, Whitehall, Dublin 19. Waste management is addressed for the construction and operational phases of the project.

A Resource & Waste Management Plan (RWMP) has been prepared for the construction phase of the development in advance of the commencement of the construction works. A separate Operational Waste Management Plan (OWMP) has also been prepared for the operational phase of the development.

The RWMP will provide information necessary to ensure that the management of 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, Protection of the Environment Act 2003 as amended, Litter Pollution Act 1997 as amended and the Eastern-Midlands Region Waste Management Plan 2015 – 2021. In particular, the RWMP 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).

The OWMP has been prepared to ensure that the management of waste during the operational phase of the proposed development is undertaken in accordance with the current legal and industry standards including, the Waste Management Act 1996 – 2011 as amended and associated Regulations, Protection of the Environment Act 2003 as amended, Litter Pollution Act 2003 as amended, the ‘Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021’ and the Dublin City Council (DCC) ‘Dublin City Council (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws’ (2018). In particular, the OWMP aims to provide a robust strategy for storing, handling, collection and transport of the wastes generated at site.

These documents will ensure the sustainable management of wastes arising at the development in accordance with legislative requirements and best practice standards.

Proposed Development Site Location and Brief Description

The proposed development will consist of the construction of 7 no. blocks in heights up to 8 storeys (over single level basement) comprising 472 no. apartment units, a creche, café unit, and internal residential amenity space. The proposal also includes car, cycle, and motorcycle parking, public and communal open spaces, landscaping, bin stores, plant areas, substations, switch rooms, and all associated site development works and services provision. Access is provided from the development from Swords Road with associated upgrades to the existing public road and footpaths. A full description of the development is provided in the statutory notices and in Chapter 3 of the EIAR submitted with the application.

Statement of Competence

In accordance with Article 5(3)(a) of the EU Directive, by appointing PUNCH Consulting Engineers, the applicant has ensured that this chapter has been prepared by “Competent experts”.

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.

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. 191 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)
- 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.

This Chapter is based on the proposed development and considers the following aspects:

- Legislative context.
- Construction phase (including site 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 construction and operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated. The waste types and estimated quantities are based on published data by the EPA in *National Waste Reports*, data recorded from similar previous developments, Irish and US EPA waste generation research, other available research sources and waste collection data from the current facilities on site.

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.

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 *A Resource Opportunity – Waste Management Policy in Ireland* was published in 2012 and stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention.

The strategy for the management of waste from the construction and demolition 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, British Standards and other relevant studies and reports including BS 5906:2005 Waste Management in Buildings – Code of Practice, the Eastern-Midland Region Waste Management Plan 2015 – 2021, the EPA National Waste Database Reports 1998 – 2012 and the EPA National Waste Statistics Web Resource.

13.3 RECEIVING ENVIRONMENT

The subject site is located at Swords Road, Whitehall, Dublin 19. In terms of waste management, the receiving environment is largely defined by Dublin City Council 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 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 2020 National Waste Statistics, which is the most recent study published, reported the following key statistics for 2017:

- Generated – Ireland produced 2.8million tonnes of municipal waste in 2017. This amounted to 577 kg of municipal waste per person. This represents a slight decrease on 2016 (581 kg per person), Ireland consistently ranks in the top tier of municipal waste producers in Europe and well above the EU average of 487 kg per person.
- Managed – Waste collected and treated by the waste industry. Over three quarters (77%) of Ireland’s municipal waste was recycled or recovered in 2017, while less than one-quarter (23%) was landfilled.
- 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 44,501 t was unmanaged in 2017 compared to 44,868 in 2016.
- Recovered – the amount of waste recycled, used as a fuel in incinerators, or used to cover landfilled waste. In 2017, almost three quarters (74%) of municipal waste was recovered, this is a decrease from 79% in 2014
- Plastic Packaging: Ireland recycled 34% of waste plastic packaging in 2017, exceeding the Packaging Directive target of 22.5%. However, the revised Packaging Directive sets significantly more ambitious plastic packaging recycling targets of 50% for 2025 and 55% for 2030

There are numerous wastes 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 proposed development will consist of the construction of 7 no. blocks in heights up to 8 storeys (over single level basement) comprising 472 no. apartment units, a creche, café unit, and internal residential amenity space. The proposal also includes car, cycle, and motorcycle parking, public and communal open spaces, landscaping, bin stores, plant areas, substations, switch rooms, and all associated site development works and services provision. Access is provided from the development from Swords Road with associated upgrades to the existing public road and footpaths. A full description of the development is provided in the statutory notices and in Chapter 3 of the EIAR submitted with the application.

When considering a development of this nature, the potential waste management impact on the surroundings must be considered for each of two distinct stages:

- Construction Phase;
- Operational Phase.

As stated, the construction and demolition phase will involve extensive excavation over the development site and the erection of a new development and associated communal facilities over a phased construction period. These issues are discussed in detail in the following sections. Waste activities relating to the construction and operation of the development in terms of waste management are discussed.

13.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

This section details the potential waste impacts associated with the proposed development.

Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during 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. Dedicated areas for waste skips and bins will need to be identified across the site. These areas will need to be easily accessible to waste collection vehicles.

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.

The use of non-permitted waste contractors or unauthorised waste 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.

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, there will be excavations associated with foundations and to accommodate basement area. PUNCH Consulting Engineers have estimated that the construction of the basement area, new foundations and underground services will involve the excavation of approximately 58,100m³ of material.

In order to establish the appropriate reuse, recovery and/or disposal route for the material 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 construction 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.

In the unlikely event that surplus soils/stones are generated it may be suitable for acceptance at either inert or non-hazardous soil recovery facilities/landfills in Ireland, In the event of hazardous material being encountered, it will be transported for treatment/recovery or exported abroad for disposal in suitable facilities.

Waste will 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 RWMP. The RWMP provides an estimate of the main waste types likely to be generated during the construction 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	816.4	10	81.6	80	653.1	10	81.6
Timber	692.7	40	277.1	55	381.0	5	34.6
Plasterboard	247.4	30	74.2	60	148.4	10	24.7
Metals	197.9	5	9.9	90	178.1	5	9.9
Concrete	148.4	30	44.5	65	96.5	5	7.4
Other	371.1	20	74.2	60	222.6	20	74.2
Total Arisings	2473.8		561.6		1679.7		232.5

Table 13-1 Estimated on and 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 construction waste that will be generated. The exact materials and quantities may be subject to some degree of change and variation during the construction process.

The opportunities for waste materials to be reused off-site will provide positive impacts in the resourcing of materials for other developments and reduce the requirement for raw material extraction.

The potential effect of construction waste generated from the proposed development is considered to be **short-term**, and **not significant**.

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. This would lead to an increased volume of waste been disposed of site.

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).

The waste materials generated on a daily basis will be stored in dedicated waste storage areas. 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.

Waste collection vehicles 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. Time and resources should be dedicated to ensuring efficient waste management practices. An Operational Waste & Recycling Management Plan has been submitted with the planning application.

The potential impact of operational waste generation from the development is considered to be **long-term** and **not significant**.

13.6 POTENTIAL CUMULATIVE IMPACTS

The cumulative impact of the additional wastes generated by the proposed development has been considered. The existing waste management infrastructure and procedures for management of waste are sufficient and as such there will be no significant cumulative impact in terms of waste from the proposed development.

13.7 MITIGATION MEASURES

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

Construction Phase

A project specific RWMP has been prepared in line with the requirements of the guidance document issued by the DoEHLG. The site-specific RWMP will be updated and submitted prior to commencement of the construction phase which may refine the above waste estimates. Adherence to the high-level strategy presented in this RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the construction phase of the proposed development.

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 banded 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.

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, the *Litter Pollution Act 1997* and the *EMR Waste Management Plan (2015 - 2021)*. It will also ensure

optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources.

Operational Phase

An Operational Waste Management Plan (OWMP) has been prepared for the development. The plan will seek to ensure the development contributes to the targets outlined in the Eastern Midlands Regional (EMR) Waste Management Plan 2015 – 2021. Mitigation measures proposed to manage impacts arising from wastes generated during the operation of the proposed development are summarised below.

All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site in accordance with the *Dublin City Development Plan 2016 – 2022*.

Waste type	Waste Volume (m ³ /week)		
	Residential Units (Combined)	Café Unit	Creche Unit
Organic Waste	6.03	0.10	0.05
Dry Mixed Recyclables	44.17	0.23	2.06
Glass	1.17	0.01	0.01
Mixed Non Recyclable	24.48	0.30	0.91
Total	75.84	0.64	3.03

Table 13-2 Estimated Waste Generation for the Proposed Development for the Main Waste Types

All waste leaving the site will be recycled or recovered, with the exception of those waste streams where appropriate recycling/recovery facilities are currently not available. All waste leaving the site will be transported by suitable permitted contractors and taken to suitably permitted or licenced facilities. All waste leaving the site will be recorded and copies of relevant documentation maintained. Hazardous waste may be generated from WEEE, batteries, fluorescent tubes, and cleaning products. Any waste classed as hazardous will be required to be taken to a specialise waste company e.g. Rilta.

All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site in accordance with the *Dublin City Council Development Plan 2016 – 2022*.

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/catering waste (including garden waste from landscaping activities).
 - Dry Mixed Recyclables.
 - Mixed Non-Recyclable Waste.
 - Glass.
 - Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment.
 - Batteries (non-hazardous and hazardous)
 - Fluorescent bulb tubes and other mercury containing waste (if arising).
 - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); and

- 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.
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities; and

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, and all associated Regulations. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

13.8 PREDICTED IMPACTS

The implementation of the mitigation measures outlined in Section 13.7 will ensure that a high rate of reuse, recovery and recycling is achieved at the development during the 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.

Construction Phase

A carefully planned approach to waste management as set out in Section 13.7 and adherence to the RWMP during the construction phase will ensure that the impact on the environment will be *short-term, neutral and imperceptible*.

Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 13.7 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 impact of the operational phase on the environment will be *long-term, neutral and imperceptible*.

13.9 'DO NOTHING' SCENARIO

If the proposed development did not go ahead there would be no waste generated at this site and operational waste generated from this site would stay at its current level.

13.10 WORST CASE SCENARIO

The 'worst-case' scenario, is that, should a RWMP not be implemented, the target recycling rates outlined in the Waste Management Plan for the DCC Region and all relevant waste guidance targets will not be achieved. In addition, if waste is not managed and stored correctly on site, this may lead to litter or pollution issues on the site or adjacent sites. However, this is thought to be unlikely having taken into consideration the mitigation measures outlined above.

13.11 MONITORING & REINSTATEMENT

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 construction phases where there is a potential for waste management to become secondary to progress and meeting construction schedule targets. The RWMP will specify the need for a waste manager to be 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.

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 required in the communal Waste Storage Areas (WSAs) where estimates have been too conservative. Reductions in bin requirements will improve efficiency and reduce waste contractor costs. Waste legislation should also be consulted on a regular basis in case of any changes which may impact on waste management procedures.

13.12 DIFFICULTIES IN COMPILING INFORMATION

There were no difficulties encountered during the production of this chapter of the EIAR.

13.13 REFERENCES

- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, August 2017);
- Draft Advice Notes for preparing Environmental Impact Statements (EPA, September 2015);
- Guidelines on Information to be contained in Environmental Impact Statements (EPA, 2002);
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements (EPA, 2003);
- EPA National Waste (Database) Reports;
- The Dún Laoghaire-Rathdown Development Plan 2016-2022;
- Waste Management Act 1996 (No. 10 of 1996), as amended.
- Eastern-Midlands Waste Region Waste Management Plan, 2015-2021, Eastern-Midlands Region, 2015.
- The Dún Laoghaire-Rathdown County Council Household & Commercial Waste Bye-Laws 2019.
- Waste Framework Directive (Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste).
- Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended
- Waste Management (Facility Permit and Registration) Regulations 2007, as amended
- Waste Management: Changing Our Ways, The Department of the Environment and Local Government, 1998.
- Preventing and Recycling Waste: Delivering Change, The Department of the Environment and Local Government, 2002.
- Taking Stock & Moving Forward, The Department of the Environment and Local Government, 2004.
- National Strategy on Biodegradable Waste Management, Department Environment, Heritage and Local Government, 2006.
- A Resource Opportunity – Waste Management Policy in Ireland, Department of the Environment, Community and Local Government, 2012.

- Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous, Environmental Protection Agency, 2015.
- Waste Management in Buildings – Code of Practice, British Standard, BS 5906:2005, 2005.
- Mobile Waste and Recycling Containers Part 1: Containers with 2 wheels with a capacity up to 400 l for comb lifting devices – Dimensions and design, British Standard, BS EN 840-1:2012, 2012.
- Mobile waste containers. Containers with four wheels with a capacity from 750 l to 1700 l with flat lid(s), for wide trunnion or BG-and/or wide comb lifting devices. Dimensions and design, British Standard, BS EN 840-4:1997, 1997.
- Municipal Waste Statistics for Ireland, EPA Waste Data Release, 31 October 2018

14 CULTURAL HERITAGE AND ARCHAEOLOGY

14.1 INTRODUCTION

This Chapter of the Environmental Impact Assessment Report (EIAR) assesses the impact of the proposed development on the Cultural Heritage Archaeology of the site at Hartfield Place, Swords Road, Dublin. The chapter has been compiled by John Purcell Archaeological Consultancy and includes a desktop study and a site inspection. The desktop section of the report was compiled using: The Records of Monuments and Places; buildings of Ireland, Excavations Bulletin; historic maps; aerial photographs; place names and historic books and journals.

The recorded and potential cultural heritage resource within the proposed development site and the surrounding its boundary were assessed in order to compile a complete cultural heritage context.

Field walking was undertaken on a number of occasions between 2020 and 2022. John Purcell Archaeological Consultancy undertook this report. Field walking was undertaken by John Purcell BA. John Purcell has been excavation licence eligible with the DAHC since 2002 and has worked consistently since then in the area of archaeology.

14.2 METHODOLOGY

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

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018)
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – Draft (EPA, 2017)
- National Monuments Acts, 1930-2014
- The Planning and Development (Strategic Infrastructure) Bill, 2006
- Heritage Act 1995
- Frameworks and Principles for the protection of Archaeological Heritage 1999
- Architectural Heritage (National Inventory) and Historic Monuments and the Local Government (Planning and Development) Act 2000

Study Methodology

This assessment consists of a paper survey identifying all recorded sites within the vicinity of the proposed development and a site inspection. The methodology has been conducted based on the guidelines from the Department of Culture, Heritage and the Gaeltacht (DAHG).

The desktop survey undertaken consisted of a document and cartographic search utilising a number of sources including the following:

- Record of Monuments and Places (RMP); The RMP records known upstanding archaeological monuments, the original location of destroyed monuments and the location of possible sites identified through, documentary, cartographic, photographic research and field inspections.
- The RMP consists of a list, organised by county and subdivided by 6" map sheets showing the location of each site. The RMP data is compiled from the files of the Archaeological Survey.
- National Inventory of Architectural Heritage; The inventory of architectural heritage lists all post 1700 structures and buildings in the country. This includes structures of architectural, historical, archaeological, artistic, cultural, social, scientific or technical importance.

- County Development Plans; The Development plan was consulted to ascertain if any structures listed in the Record of Protected Structures (RPS) and/or any Architectural Conservation Areas (ACAs). The Record of Protected Structures lists all protected structures and buildings in Dublin. This includes structures of architectural, historical, archaeological, artistic, cultural, social, scientific or technical importance.
- Cartographic Sources; The following maps were examined: Down Survey, 1st edition Ordnance Survey Maps (1836-1846) and 2nd edition Ordnance Survey Maps (1908), Rocque Map and the Cassini Map.
- Literary Sources; Various published sources, including local and national journals, were consulted to establish a historical background for the proposed development site. Literary sources are a valuable means of completing the written record of an area and gaining insight into the history of the environs of the proposed development. Principal archaeological sources include: The Excavations Bulletin; Local Journals; Published archaeological and architectural inventories; Peter Harbison, (1975). Guide to the National Monuments of Ireland; and O'Donovan's Ordnance Survey Letters.
- Previous archaeological assessments and excavations for the area were reviewed.

A comprehensive list of all literary sources consulted is given in the bibliography.

Site Inspection

An archaeological field inspection survey seeks to verify the location and extent of known archaeological features and to record the location and extent of any newly identified features. A field inspection should also identify any areas of archaeological potential with no above ground visibility. Many monument types do not leave surface markers. Wooden sites such as prehistoric house or burials may only be recorded through excavation works.

Site visits were undertaken in May 2019 and June 2020.

Assessment Criteria

The criteria used to assess the significance of the impact of a development on an archaeological landscape, site, feature, monument or complex are defined as follows:

- Profound, Applies where mitigation would be unlikely to remove adverse effects. Reserved for adverse, negative effects only. These effects arise where an archaeological site is completely and irreversibly destroyed by a proposed development.
- Significant, an impact which, by its magnitude, duration or intensity, alters an important aspect of the environment. An impact like this would be where part of a site would be permanently impacted upon, leading to a loss of character, integrity and data about the archaeological feature/site.
- Moderate, A moderate direct impact arises where a change to the site is proposed which though noticeable, is not such that the archaeological integrity of the site is compromised, and which is reversible. This arises where an archaeological feature can be incorporated into a modern-day development without damage and that all procedures used to facilitate this are reversible.
- Slight, An impact which causes changes in the character of the environment which are not significant or profound and do not directly impact or affect an archaeological feature or monument.
- Imperceptible, An impact capable of measurement but without noticeable consequences.

14.3 RECEIVING ENVIRONMENT

The site has been extensively disturbed. The northern section of the site was used as an access tunnel for the Port Tunnel, the remainder of the site was used as a compound for the entity of these works. This involved extensive excavation at the site, the extent of this is visible in the 2005 aerial photographs of the site (Figure 13.2). Enabling works and road network have also occurred at the site under Dublin City Council planning refABP 29N.238685. This took place in January 2021. These works were assessed at the time by the author (Plate 13.1)



Figure 14-1 2005 Aerial photograph of the site showing the level of disturbance

14.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will consist of the construction of 7 no. blocks in heights up to 8 storeys (over single level basement) comprising 472 no. apartment units, a creche, café unit, and internal residential amenity space. The proposal also includes car, cycle, and motorcycle parking, public and communal open spaces, landscaping, bin stores, plant areas, substations, switch rooms, and all associated site development works and services provision. Access is provided from the development from Swords Road with associated upgrades to the existing public road and footpaths. A full description of the development is provided in the statutory notices and in Chapter 3 of the EIAR submitted with the application.

14.5 GENERAL ARCHAEOLOGICAL AND HISTORICAL SUMMARY

Prehistory

The Sites and Monuments Record (SMR) lists a number of prehistoric sites in this part of Co. Dublin. The earliest recorded archaeology in the area dates from the Neolithic (4,200-2,500BC). At this stage communities became more stable with the introduction of agricultural practices. The more permanent settlement allowed communities to construct large ceremonial sites. These megalithic monuments are located across the north of Co. Dublin.

The bronze age marks the introduction of metal working to Ireland. This allowed for more efficient farming and hunting techniques. It also allowed for small industry and trade to take place between communities. Barrows are a common form of monument across in this area from this period. These are associated with the Bronze/Iron Age burial tradition (c. 2400 BC - AD 400) and are defined by an artificial mound of earth or earth and stone, normally constructed to contain or conceal burials. These sites vary in shape and scale and can be variously described as bowl-barrow, ditch barrow, embanked barrow, mound barrow, pond barrow, ring-barrow and stepped barrow. The incidence and frequency of these sites in the area attests to the extent of prehistoric settlement in this area from earliest times. Prehistoric settlements sites are generally not visible at ground level and can only be uncovered as a result of ground works.

Iron Age to Early Medieval Period

In late Bronze Age Ireland the use of the metal reached a high point with the production of high quality decorated weapons, ornament and instruments, often discovered from hoards or ritual deposits. The Iron Age however is known as a 'dark age' in Irish prehistory. Iron objects are found rarely, but there is no evidence for the warrior culture of the rest of Europe, although the distinctive La Tené style of art with animal motifs and spirals was adopted. Political life in the Iron Age seems to have been defined by continually warring petty kingdoms vying for power. These kingdoms, run on an extended clan system, had their economy rooted in mixed farming and, in particular, cattle. Settlement was typically centred on a focal hillfort.

Settlement in the Early Medieval Period is defined by the ringfort. These are the commonest monument across the country and have been frequently recorded in the area.

The introduction of Christianity to Ireland in the fifth century had a profound impact on Gaelic society, not in the least in terms of land ownership and the development of churches and religious houses. A number of early Christian Monuments are located in the vicinity of the site these include Holy Wells and Bullaun stones.

Historic Period

Following the Norman Conquest of the county a number of Motte and Baileys were constructed in the area. These consist of square, rectangular or occasionally circular area, sometimes raised above the ground, enclosed by a wide, often water-filled, fosse, sometimes with an outer bank and with a wide causewayed entrance. They date to the late 13th/early 14th centuries and were primarily fortified residences/farmsteads of Anglo-Norman settlers though they were also built by Gaelic lords. These represent the first Anglo Norman foray in the area. After the moated sites a series of Tower Houses were built across the county by the Normans descendants and local families.

Post Medieval Ireland

Seventeenth century Ireland saw massive upheaval a result of the Confederate wars, the Cromwellian response and the Wars of the two kings. The impact on the country was profound. It has been estimated that up to a third of the population was wiped out because of famine, disease and war. Soldiers were given land as payment resulting in further upheaval of the local population and the establishment of large estates. These came to dominate the landscape from this period onwards. Religious intolerance in other parts of Europe resulted in the expulsion of the Huguenot from France which were welcomed by the English Crown into Ireland.

Industrial Period

The eighteenth century saw considerable industrial growth across the country. A series of mills were constructed in the wider environs of the site to service the growing agricultural industry. Throughout the 18th century the population of the county continued to expand and the area began to develop as a suburb of Dublin and included a number of Large Residencies.

Archaeological Monuments

A number of archaeological monuments are located in the environs of the proposed development, these are listed below;

DU014-103----

Class: Ring-ditch

Townland: CLAREMONT

A circular ring-ditch visible as a crop mark on an aerial photograph (SMR file; pers. comm. T. Condit).

DU018-005001-

Class: Ecclesiastical site

Townland: Dublin North City

The present Church of Ireland on Church Avenue was rebuilt in 1717, probably on the site of the monastery founded by St. Mobhi (d. 544 AD). The 16th century life of St. Columba by Manus O'Donnell describes a miracle

whereby the huts and church of St Mobhi ended up of on the east bank of the Tolka (Killanin & Duignan 1967, 251). During the 13th century this church was part of the homefarm for the Priory of the Holy Trinity, Christchurch (Ball 1920, 124-147). The N wall is thicker in the W tower indicating that it may be earlier than the existing church. In 1941 two skeletons were discovered when a path was being laid in Church Lane and in 1956 a number of skeletons were discovered on a site N of Mobhi Lane, just E of the church. Finds included animal bones and a knife-like iron object (NMI 1956-16). These burials suggest that the burial ground associated with the Early medieval foundation extended much further than the present graveyard wall.

DU018-013002-

Class: Graveyard

Townland: DRUMCONDRA

Attached to the Church of St. John the Baptist (1734) on the grounds of All Hallows College. The Church of St. John the Baptist was built on the site of a medieval foundation associated with the Priory of All Saints (DU018-013001-). After the Dissolution of the priory a small church dedicated to St. Margaret was erected (Ball 1920, 6 182-183). The antiquarian Francis Grosse and James Gandon, the architect are buried in the graveyard.

Monument Type	RMP	Townland	Distance to Study Area
Ring Ditch	DU 014 103	Claremont	1.7km
Ecclesiastical Site	DU 18 005/01	Dublin City North	1.5km
Church and Graveyard	DU 18 13	Drumcondra	1.6km

Table 14-1 Archaeological features in the vicinity of the study area



Figure 14-2 RMP Extract with the Location of the Study Area Marked

Site Survey

The site does not include any visible archaeological remains and is at a remove from the recorded archaeological sites in the area. The site has been extensively excavated during construction works for the port tunnel and under a previous planning application at the site. No original ground remains at the site (Plates 13.1-13.4).

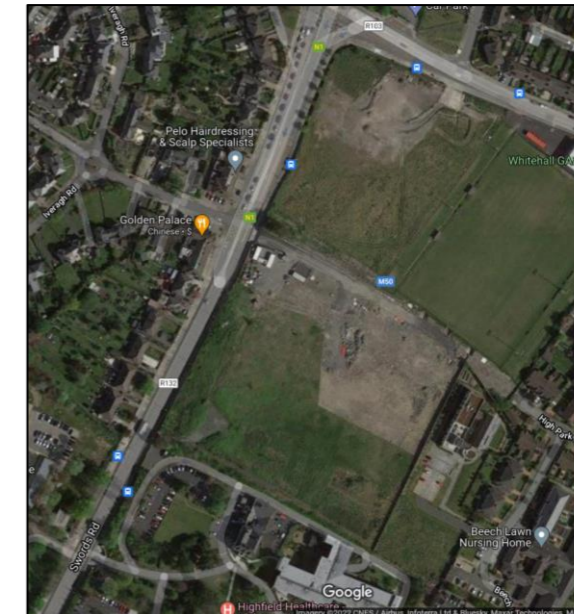


Plate 14-1 Aerial photograph of the site



Plate 14-2 Looking north over the site with the Swords Rd. visible



Plate 14-3 Looking east over the site



Plate 14-4 Looking east over the site

Previous Archaeological Works

Three reports are listed in the database of Irish excavations (excavations.ie) for Clonturk, Co. Dublin. No archaeological features were identified during these works.

Cartographic Evidence

An examination of the cartographic evidence for the area of proposed development was undertaken. This involved the 17th century Down Survey, the Rocque Map, the first edition of the Ordnance Survey Map and its later editions (12.4-12.5), and the Cassini map for the area. No additional features indicative of archaeological remains were visible on the maps or the aerial photographs for the site.

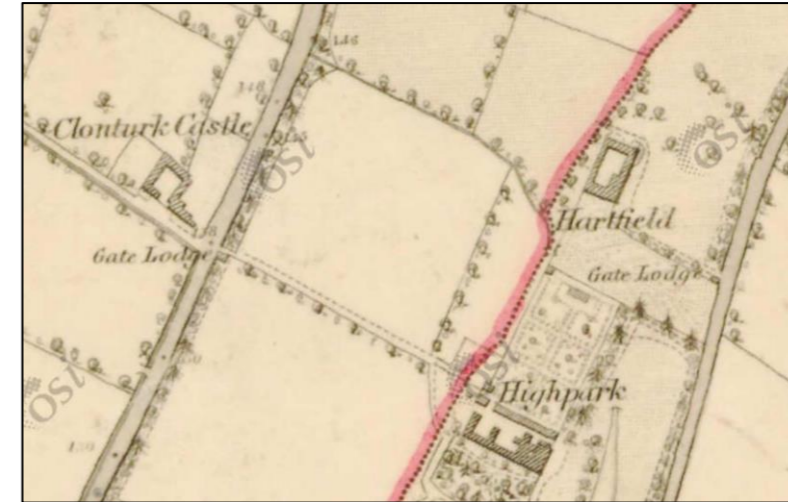


Figure 14-3 First edition OS map for the site



Figure 14-4 25" OS map for the site

Place name Evidence

Townland names can give an indication of previous activities at the area that have since been forgotten and leave no trace at ground level. They can contain information on previous ownership, land use or archaeological monuments such as churches or settlement sites. Townland boundaries may reflect ancient territories, and some have associated archaeological features. The site is within the small townland of Clonturk, the townland boundary is located to the east of the boundary of the site. Clonturk translates to Cluain Torc and means 'the pasture of the boars' (taken from logainm.ie).

Protected Structures

The proposed development does not include any structures listed in the National Inventory of Architectural Heritage. Highfield Hospital bounds the site at the south (NIAH Reg. 50130254). An associated High Park Cemetery is located to the east (NIAH Reg. 50130254). These structures are at a remove from the proposed development and are within a built up urban area. As a result there will be no impact on them as a result of the proposed development.

14.6 POTENTIAL IMPACTS

Construction Phase

No recorded archaeological features will be impacted on by the proposed development. The proposed development is at a remove from the recorded archaeological monuments and construction will have no negative

impact on them. No features were identified during the site survey. All areas of the development have been extensively excavated and the potential for archaeological remains to be uncovered at the site is negligible. No further mitigation is recommended.

Operational Phase

There are no potential impacts on archaeological cultural heritage expected as a result of the operational phase of the proposed development.

14.7 POTENTIAL CUMULATIVE IMPACTS

The proposed development will not impact on the cultural heritage landscape as a result there will be no cumulative effect on the archaeological landscape as a result of the proposed development.

14.8 MITIGATION MEASURES

Construction Phase

All areas of the site have been extensively excavated. The archaeological potential for the area is negligible as a result of this no further archaeological input is recommended.

Operational Phase

No mitigation is required at operational stage of the development.

14.9 PREDICTED IMPACTS

Construction Phase

The study area does not include any recorded archaeological monuments and the potential for archaeological remains to exist at the site are very low. As a result of this there are no predicted impacts on the cultural heritage landscape by the proposed development.

Operational Phase

There will be no impact on the cultural heritage landscape during the operational phase of the proposed development.

14.10 DO NOTHING SCENARIO

Should the development not proceed this will not impact on or enhance the archaeological heritage of the site. Should this proposed development not proceed, given the sites sought after location, its zoning for residential development and the pressing need for housing, it is likely that development will proceed in the near future.

14.11 WORST CASE SCENARIO

The proposed development has no impact on the archaeological landscape.

14.12 MONITORING AND REINSTATEMENT

There will be no impact on the cultural heritage landscape on during any reinstatement works

14.13 DIFFICULTIES IN COMPILING INFORMATION

There were no difficulties encountered in compiling this report.

14.14 REFERENCES

- Department of Arts, Heritage, Gaeltacht & the Islands, 1999, Policy and Guidelines on archaeological excavation.
- Edwards, N. The Archaeology of Early Medieval Ireland, Routledge.
- Harbison, 1975, Guide to the National Monuments of Ireland, Gill and MacMillan.
- Flanagan, L. A Dictionary of Irish Archaeology, Rowman and Littlefield.
- Mallory J.P. and MacNeill, T.E. 1991, The Archaeology of Ulster, Institute of Irish Studies, Queens University Publications.
- McAlister, V. The Irish Tower House: Society, Economy and Environment, C1300-1650, Manchester University Press.
- Sullivan, A. Early Medieval Archaeology AD 400-1100. RIA
- National Monuments Acts 1930-2004.
- www.archaeology.ie www.Buildingsofireland.ie
- www.exacavations.ie www.seanrua.ie
- loganimn.ie
- www.geohive.ie

15 INTERACTIONS

15.1 INTRODUCTION

As a requirement of the Planning and Development Regulations 2001, as amended, and the draft EPA guidelines (2017), not only are the individual significant impacts required to be considered when assessing the impact of a development on the environment, but so must the interrelationships between these factors be identified and assessed.

Under the Regulations interactions between the various environmental factors, are to be assessed as well as the vulnerability of the proposed development to the risk of natural disaster.

15.2 ASSESSMENT

Where an interaction is likely, it is given a reference number in the matrix and detail of the interaction is recorded below. The significance, quality – whether it is positive, negative or neutral – and the duration of the interaction is assessed. The interactions are listed in numerical sequence, purely for referencing purposes. Each of these interactions have been addressed in the relevant EIAR chapters.

	Population	Biodiversity	Soil	Hydrology	Noise	Air and Climate	Landscape	Traffic	Waste	Cultural Heritage	Material Assets
Population											
Biodiversity											
Soil	1	9									
Hydrology	2	10	13								
Noise	3	11									
Air and Climate	4		14								
Landscape	5	12	15								
Traffic	6										
Waste	7										
Cultural Heritage											
Material Assets	8										

Table 15-1 Interaction Matrix

1. Population & Human Health / Soils

There is potential for dust generation during construction works, which under dry and windy conditions could lead to localised dust impacts for the small number of properties proximate to the development site such as Beech Lawn Nursing Home and Highfield Healthcare Centre. However, the implementation of dust management and dust control measures will ensure that the proposed development will not give rise to the generation of any significant quantities of dust. As a result, the impact will be temporary, imperceptible and neutral/ negative.

2. Population & Human Health / Water

Failure or mismanagement of the potable water supply could lead to its contamination during the construction phase. A range of mitigation measures, as outlined in Chapter 7 and the CEMP submitted with this application, will be put in place during the construction phase of the development to ensure this does not occur. The correct implementation of these mitigation measures will ensure that the potential impacts on hydrology and water services during the construction phase will be imperceptible and short term.

3. Population & Human Health / Noise

Increased noise levels during the construction phase will be temporary and are not expected to have a long-term significant adverse effect upon the local population. The application of binding noise limits, hours of operation, along with implementation of the mitigation measures, as identified in Chapter 8 and the CEMP, will ensure that noise and vibration impact will have a negative, moderate, and short-term impact on the surrounding environment.

The impact due to the increased traffic associated with the operational development is expected to be neutral, imperceptible, and long-term.

4. Population & Human Health / Air

The completed development will generate additional emissions to the atmosphere due to traffic associated with the development. However, air quality in the vicinity of the site is expected to remain within air quality standards, and the impact is expected to be imperceptible.

During construction, there may be potential for slight dust nuisance in the immediate vicinity of the site. However, dust control measures, such as wheel washes, covering of fine material etc. will minimise the impacts on air quality. As a result, the impact will be temporary, imperceptible and neutral/ negative.

5. Population & Human Health / Landscape

Existing residents and visitors to the Whitehall area interact with the landscape, such that they will be aware of a significant change at this site from a vacant site to a new residential development with a mix of unit types, building heights, open spaces etc. Chapter 10 notes that this change is positive in the context of the urban fabric of the area.

6. Population & Human Health / Traffic

There will be the construction traffic on the roads in the vicinity of the site for the duration of the construction works. Chapter 11 notes that, following the implementation of the mitigation measures, the impact of this construction traffic will be low level.

Once complete, the proposed development will result in additional traffic on the surrounding roads. Chapter 11 notes that, following the implementation of the MMP submitted with the application, the anticipated impact is expected to be low level.

7. Population & Human Health / Waste

The construction phase of development will generate both hazardous and non-hazardous waste. This could lead to litter or pollution issues which would have a negative impact on the local population. However, once the mitigation measures are implemented, the impact is predicted to be short-term, neutral and imperceptible

Once complete the proposed development will generate increased levels of household and commercial waste. This increase in waste is unavoidable but following the implementation of the waste management plans submitted with the application, the impact is predicted to be long-term, neutral and imperceptible.

8. Population & Human Health / Materials Assets

There is the potential for contamination of potable water supply, gas leaks or explosions, loss of supply of services. With the implementation of the mitigation measures in Chapter 12 the impact of the proposed built services on human health is likely to be imperceptible.

9. Biodiversity / Soils

The construction phase will result in removal of vegetation and soil which is expected to have a negligible impact once the mitigation measures are implemented.

The landscaping masterplan includes a wildlife corridor and therefore the operational phase is expected to have no significant residual impact on biodiversity.

10. Biodiversity / Water

As noted in chapter 5, the closest waterbody to the site is the Tolka River located south of the site and there is no direct connection between the site and the surface water bodies and therefore it is expected that no significant residual effects are likely to arise to biodiversity.

As concluded in the Appropriate Assessment Screening Report submitted with the proposed project is not anticipated to have a significant impact via surface water, groundwater and lands and air pathways to any Natura 2000 site.

11. Biodiversity / Noise

Increased noise levels during the construction phase will only be temporary and are not expected to have a long-term significant adverse effect upon remaining fauna within the wider landscape.

Operational noise will be audible at a low level in the ambient noise and the impact is predicted to be neutral, imperceptible and long-term.

12. Biodiversity / Landscape

Due to the negligible or low local value of the existing biodiversity on the subject site, the removal of habitats during the construction phase will have a neutral and imperceptible impact.

The proposed landscape masterplan includes the planting of native trees and other vegetation and as noted in chapter 5, will have no significant residual impact on biodiversity.

13. Soils / Water

The construction phase could result in uncontrolled sediment erosion, contaminated silty run-off, and pollution of surface waters by mobilised suspended solids. Mitigation measures, as outlined in Chapter 7 and the CEMP, will be implemented during construction to prevent these potential impacts. As a result the impact will be negligible.

14. Soils / Air

Exposed soil during the construction phase of the proposed scheme will give rise to increased dust emissions. Chapter 9 notes that when the dust management measures, as outlined in Chapter 9, are implemented, fugitive emissions of dust from the site will be neutral effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.

15. Soils/Landscape

Residual soils arising as a result of excavation at the development site will be used in landscaping works in the proposed public open spaces as much as possible rather than transporting off-site. This impact will be imperceptible and long-term.

16 SCHEDULE OF MITIGATION MEASURES

16.1 INTRODUCTION

Given the complexity of the proposed development and this EIAR, this chapter seeks to provide a complete summary of mitigation measures proposed in Chapters 4 to 16. The appointed contractor will be required to adhere to the mitigation contained in the EIAR. Monitoring of the effectiveness of mitigation measures put forward in the EIAR document by the competent authorities is also integral to the process.

16.2 CONSTRUCTION PHASE

<p>16.2.1 Population and Human Health</p>	<p>A preliminary Construction and Environmental Management Plan (CEMP) has been prepared by Punch and will be implemented during the construction phase to reduce the detrimental effects of the construction phase on the environment and local population. A more detailed CEMP will be formally agreed in writing with the planning authority in writing prior to the commencement of the development (the preliminary CEMP, incorporating mitigation measures, is included with this application).</p> <p>Chapter 8 notes that the application of Best Practicable Means (BPM) through the implementation of the CEMP will ensure construction noise and vibration impacts are minimised.</p> <p>The Dust Management Plan included in Appendix 9.3 will minimize the impact of dust nuisance.</p> <p>Chapter 11 Traffic and Transportation and the CEMP submitted with the application include traffic management measures to minimise the impact of construction traffic.</p> <p>These measures are put forward to avoid any significant negative environmental impacts on the population and human health. No additional mitigation measures are considered necessary.</p>
<p>16.2.2 Biodiversity</p>	<p>Hedgehog, Pygmy Shrew and Badger</p> <p>Although disturbance to wildlife during the construction work will be temporary, general avoidance measures should be undertaken to protect wildlife while the works are being carried out.</p> <p>General avoidance measures that should be incorporated by the contractors working on site include:</p> <ol style="list-style-type: none"> 1. Limit the hours of working to daylight hours, where possible, to limit disturbance to nocturnal and crepuscular animals; 2. Due to the potential presence of Badger; Hedgehog; and Pygmy Shrew, the use of lighting at night should be avoided. If the use of lighting is essential, then a directional cowl should be fitted to all lights to prevent light spill and to be directed away from retained vegetation; 3. Contractors must ensure that no harm comes to wildlife by maintaining the site efficiently and clearing away materials which are not in use, such as wire or bags in which animals can become entangled; and 4. Any pipes should be capped when not in use (especially at night) to prevent animals becoming trapped. Any excavations should be covered overnight to prevent animals from falling and getting trapped. If that is not possible, a strategically placed plank should be placed to allow animals to escape. <p>Bats – roosting, commuting, and foraging</p> <p>The use of lighting at night during construction should be avoided. If the use of lighting is essential, there will be no lighting of the two mature trees with bat roost potential in the north west corner outside of the site boundary by the use of directional lighting.</p> <p>Breeding birds</p> <p>Removal of trees and scrub will be conducted outside of the bird nesting season (March to August inclusive). If this is not possible, a breeding bird survey by an appropriately qualified ecologist will be undertaken in advance of the works to ensure that there will be no impacts on nesting birds. If nests are found, they will be safeguarded, with an appropriate buffer, until the chicks have successfully fledged.</p>

	<p>Invasive Non-native Species</p> <p>As Winter Heliotrope occurs extensively along the western boundary, it should be managed prior to clearance of vegetation and works commence in the area. Winter Heliotrope should be removed and appropriately disposed to avoid further dispersal of the species. Removal of Winter Heliotrope can be done by either physical control or chemical control. Due to an extensive rhizome network, physical removal is only practical on a limited scale. The Winter Heliotrope is extensive on the present site and as such chemical control is the preferred option.</p> <p>Chemical control: Application of a glyphosate-based herbicide will be carried out after flowering in February to March, or in mid to late summer before the foliage begins to die back. All Plant Protection Products will be used in accordance with the product label and with Good Plant Protection Practice as prescribed in the European Communities (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003). It is an offence to use Plant Protection Products in a manner other than that specified on the label (NRA, 2010). Follow-up will be carried out with foliar spray, wiper applicator or spot treatment. Control measures are based on “Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads” (NRA, 2010).</p> <p>Butterfly Bush and Cotoneaster are scattered throughout the site. They should be managed prior to clearance of vegetation and works commence in the area. Both species should be removed and appropriately disposed to avoid further dispersal of the species in the soil. Mechanical methods of control comprise pulling young seedlings and excavating the root mass. Any material containing Butterfly Bush/Cotoneaster waste must be removed to licensed landfill as controlled waste.</p>
<p>16.2.3 Land, Soil and Geology</p>	<p><i>Stripping Topsoil</i> Full topsoil removal will be required to implement the required works. Topsoil that can be reused for landscaping works will be stockpiled on site. The remaining topsoil will be removed from site.</p> <p><i>Excavation of Subsoil Layers</i> Minor subsoil removal will be required where works require excavation to install foundations and services and other works. The impact of this is expected to be minimal.</p> <p><i>Construction Traffic</i> Construction traffic will be in operation during the proposed works. This will comprise construction workers, temporary special construction vehicles, cranes, and excavation machinery. Their impact on the land and soil is expected to be limited to their operations related to the construction works, and therefore is expected to be short term in nature. Construction traffic management is outlined in the Construction Management Plan (CMP) included in the planning application. A Construction Traffic Management Plan (CTMP) will be developed by the contractor prior to the commencement of work on site and will be prepared in consultation with DCC. Construction debris particularly site clearance, spoil removal and dirty water run off can have a significant impact on footpaths and roads adjoining a construction site, if not adequately dealt with and these matters will require to be fully addressed in the contractors CTMP.</p> <p>Below is a list of the proposed traffic management measures to be adopted during the construction works. Please note that this is not an exhaustive list, and that it will be the appointed contractor’s responsibility to prepare a detailed CTMP.</p> <ol style="list-style-type: none"> 1. Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access locations 2. Construction and delivery vehicles will be instructed to use only the approved and agreed means of access; and movement of construction vehicles will be restricted to these designated routes. 3. Consideration will be given to reduce the volume of construction traffic accessing the site through reduce – reuse and recycle methods. Delivery control will also be adopted to reduce potential heavy vehicle convoys. 4. Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material. 5. Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the site; 6. Parking of site vehicles will be managed and will not be permitted on the public road, unless proposed within a designated area that is subject to traffic management measures and agreed with DCC. 7. A road sweeper will be employed to clean the public roads adjacent to the site of any residual debris that may be deposited on the public roads leading away from the construction works. 8. On site wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the site, to remove any potential debris on the local roads. 9. All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol, or diesel. Spill kits will be available on site. All scheduled maintenance carried out off-site will not be carried out on the public highway; and 10. Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users including mobility impaired persons. <p>In order to provide fuel to the relevant items of plant on site, a certified double skinned metal fuel tank with integrated pump, delivery hose, meter, filter and locking mechanism will be situated in a secure area on the construction site. It will be situated within a bund. This tank will be certified for lifting when full. Sand piles and emergency clean up spill kits will be readily available in the event of a fuel spill. A hazardous bin will also be available to contain any spent sand or soak pads. New metal gerry cans with proper pouring nozzles will be used to move fuel around the site for the purposes of refuelling items of small plant on site. Drip trays will be used under items of small plant at all times. Any waste oils etc. contained in the drip trays or the bunded area will be emptied into a waste</p>

	<p>oil drum, which will be stored within the bund. Metal gerry cans and any other items of fuel containers will be stored in certified metal bunded cabinets. Any gas bottles will be stored in a caged area at a secure location on the site. All will be properly secured at point of work to mitigate accidental spills and leaks.</p> <p><i>Waste Management</i> Waste should be stored on site in a designated area and removed from site regularly. Contaminated materials are to be bunded prior to removal from site so as not to have damaging effects on the soils and geology underneath.</p> <p><i>Noise and Vibration</i> The mitigation measures for construction phase noise and vibration are outlined in Chapter 8. The measures relevant to land, soil and geology is the application/implementation of Best Practicable Means (BPM) from BS 5228 during construction including:</p> <ol style="list-style-type: none"> 1. Unnecessary revving of engines will be avoided and equipment will be switched off when not in use; 2. Internal haul routes will be kept well maintained; 3. Rubber linings in, for example, chutes and dumpers will be used to reduce impact noise; 4. Drop heights of materials will be minimised; 5. Plant and vehicles will be sequentially started up rather than all together; 6. Plant will always be used in accordance with manufacturers' instructions. Care will be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading will also be carried out away from such areas; and 7. Regular and effective maintenance by trained personnel will be undertaken to keep plant and equipment working to manufacturer's specifications. <p>The effectiveness of the application of mitigation measures is dependent on the construction methodology and the appointed construction contractor.</p>
<p>16.2.4 Hydrology</p>	<p>Throughout the construction works, all surface water (water from excavations etc.) will be pumped to a holding and settlement tank on site for treatment. The discharge water from the final tank will be routed to the existing surface water system with approval from the local authority. Visual checks of the settlement system will be carried out on a routine basis. Please refer to the Construction & Demolition Waste Management Plan by AWN Consulting for further information including the use of silt and petrochemical interception 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.</p> <p>In order to provide fuel to the relevant items of plant on site, a certified double skinned metal fuel tank with integrated pump, delivery hose, meter, filter and locking mechanism will be situated in a secure area on the construction site. It will be situated within a bund. This tank will be certified for lifting when full. Sand piles and emergency clean up spill kits will be readily available in the event of a fuel spill. A hazardous bin will also be available to contain any spent sand or soak pads. New metal gerry cans with proper pouring nozzles will be used to move fuel around the site for the purposes of refuelling items of small plant on site. Drip trays will be used under items of small plant at all times. Any waste oils etc. contained in the drip trays or the bunded area will be emptied into a waste oil drum, which will be stored within the bund. Metal gerry cans and any other items of fuel containers will be stored in certified metal bunded cabinets. Any gas bottles will be stored in a caged area at a secure location on the site. All will be properly secured at point of work.</p> <p>Surveys will be undertaken to ascertain the exact location of all infrastructure. The material assets are to be constructed in accordance with all relevant Dublin City Council and Irish Water standards.</p> <p>These measures will be addressed within the Contractors method statements for the works. The contractor is to conduct the works in accordance with all relevant local authority requirements, and health and safety legislation.</p>
<p>16.2.5 Noise and Vibration</p>	<p>Mitigation measures that are typically applicable to construction sites will be included within the CEMP that have been prepared for the Proposed Development. The CEMP will include the relevant noise and vibration criteria, proposed surveys and a range of BPM giving regard to the guidance in BS 5228.</p> <p>The application of Best Practicable Means (BPM) through the implementation of the CEMP will ensure construction noise and vibration impacts are minimised. Examples of BPM from BS 5228 will be implemented during construction works are presented below:</p> <ul style="list-style-type: none"> • Unnecessary revving of engines will be avoided and equipment will be switched off when not in use; • Internal haul routes will be kept well maintained; • Rubber linings in, for example, chutes and dumpers will be used to reduce impact noise; • Drop heights of materials will be minimised; • Plant and vehicles will be sequentially started up rather than all together; • Plant will always be used in accordance with manufacturers' instructions. Care will be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading will also be carried out away from such areas; and • Regular and effective maintenance by trained personnel will be undertaken to keep plant and equipment working to manufacturer's specifications.

	<p>During the construction phase of the Proposed Development, appropriate mechanisms to communicate with local residents would be set up to highlight potential periods of disruption with appropriate complaint procedures put in place.</p>
<p>16.2.6 Air and Climate</p>	<p><u>Air Quality</u> The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the dust management plan. The key aspects of controlling dust are listed below. Full details of the dust management plan can be found in Appendix 9.3.</p> <ol style="list-style-type: none"> 1. The specification and circulation of a dust management plan for the site and the identification of persons responsible for managing dust control and any potential issues; 1. The development of a documented system for managing site practices with regard to dust control 1. The development of a means by which the performance of the dust management plan can be monitored and assessed; 2. The specification of effective measures to deal with any complaints received. <p>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. The procedures to rectify the problems are set out in appendix 9.3 (Dust Management Plan).</p> <p>Dust nuisance is defined when air quality standards relating to dust deposition and PM₁₀ are exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented.</p> <p><i>In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of a Dust Management Plan</i> (see appendix 9.3). Provided the dust management measures outlined in the plan (see Appendix 9.3) are adhered to, the air quality impacts during the construction phase will not be significant. Regard has also been taken for the import of infill materials from off-site locations and potential dust impacts as a result of this will also be mitigated.</p> <p><u>Climate</u> 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 development. Construction vehicles, generators etc., may give rise to some CO₂ and N₂O emissions. However, due to short-term and temporary nature of these works, the impact on climate will not be significant. However, due to short-term and temporary nature of these works, the impact causes noticeable changes in the character of the environment but without significant consequences.</p> <p>Nevertheless, some site-specific mitigation measures will be implemented during the construction phase of the proposed development to ensure emissions are reduced further. In particular the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising delivery vehicles due to poor timing or ordering on site will aid to minimise the embodied carbon footprint of the site.</p> <p><u>Mitigation Measures (Construction)</u></p> <ol style="list-style-type: none"> 1. Avoid unnecessary vehicle movements and manoeuvring, and limit speeds on site so as to minimise the generation of airborne dust. 2. Manual Stripping of buildings of internal fixings, metals, glass and asbestos. 3. A 3m high solid wooden hoarding with a 3m high dust net shall be erected around the entire construction site perimeter giving a total dust barrier height of 6m. 4. Use of rubble chutes and receptor skips during construction activities. 5. All buildings in which asbestos has been identified shall be sealed during the asbestos removal process. Asbestos shall only be removed by an appropriately permitted company. All asbestos waste shall be double bagged, stored in a dedicated sealed waste container/skip prior to removal off-site for disposal at an appropriately permitted/licenced facility. Records of all asbestos waste removed from site shall be maintained by the site manager and certificates of destruction shall be provided by the asbestos removal contractor. Asbestos surveys shall be conducted by an appropriately HSE approved contractor. 6. During dry periods, dust emissions from heavily trafficked locations (on and off site) will be controlled by spraying surfaces with water and wetting agents. 7. Hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads will be restricted to essential site traffic only. 8. A road sweeper vehicle shall be on-site at all times to clean soiled public roads in the vicinity of the site. 9. A mobile wheel wash unit shall be installed at the site exit to wash down the wheels of all trucks exiting the site.

10. An independent environmental consultant shall be appointed by the contractor to prepare a dust control and monitoring method statement prior to the commencement of site activities.
11. A weekly inspection of each dust gauge will ensure that the site manager identifies at the earliest instance if dust suppression techniques shall be implemented at the project site areas.
12. Re-suspension in the air of spillages material from trucks entering or leaving the site will be prevented by limiting the speed of vehicles within the site to 10kmh and by use of a mechanical road sweeper.
13. The overloading of tipper trucks exiting the site shall not be permitted.
14. Aggregates will be transported to and from the site in covered trucks.
15. Where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser.
16. Wetting agents shall be utilised to provide a more effective surface wetting procedure.
17. Exhaust emissions from vehicles operating within the construction site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, rather than just following breakdowns; the positioning of exhausts at a height to ensure adequate local dispersal of emissions, the avoidance of engines running unnecessarily and the use of low emission fuels.
18. All plant not in operation shall be turned off and idling engines shall not be permitted for excessive periods.
19. 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.
20. Material stockpiles containing fine or dusty elements including top soils shall be covered with tarpaulins.
21. Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used to prevent unnecessary dust emissions by the erection of wind breaks or barriers. All concrete cutting equipment shall be fitted with a water dampening system.
22. A programme of air quality monitoring shall be implemented at the site boundaries for the duration of construction phase activities to ensure that the air quality standards relating to dust deposition and PM₁₀ are not exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented.
23. A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.

Table 9.22 presents a summary of dust control techniques which will be implemented at the site during activities.

SUMMARY OF DUST CONTROL TECHNIQUES	
Sources of Particular Matter	Control Technique
Loading and unloading processes	Containment / Suppression
	Reducing drop heights
	Use of variable height conveyors
Double handling transfer points	Use of chutes
	Site and process design
Aggregate stockpiles	Reduction of vehicle movements
	Appropriate siting
	Away from closest receptors/site boundaries
	Use of enclosures and bunding
	Reduced drop heights
	Water suppression
	Sprays
Bowsers	

			Covering Covered stock bins Dust covers
		Mobile Crushing of site generated C&D Waste (if applicable)	Appropriate siting Away from closest receptors/site boundaries Use of enclosures and bunding Reduced drop heights Water suppression Sprays Bowsers
		Conveyors / transfer points	Containment Wind boards Housings Suppression Water sprays Housekeeping Clean up of spilled materials Appropriate siting Away from closest receptors/site boundaries
		Concrete Cutting Plant	Suppression Water sprays fitted to equipment/plant
		Roadways including site yard area	Suppression Water sprays and bowsers Wheel wash at site compounds
		Vehicles	Washing / Covering Wheel wash to be installed at site exit Vehicles exiting the site with C&D loads shall be covered with tarpaulin
16.2.7 Landscape and Visual Impact	The main mitigation measure employed at construction stage, which will benefit landscape and visual receptors, is the use of a solid construction hoarding around the site. Although this has numerous safety and mitigation functions including the reduction of dust and noise, it will screen cluttered views of stockpiles of excavated material and building materials as well as the movement of ground based workers and machinery. It will also screen basement and ground floor construction elements until such time as the higher storeys emerge above the hoarding.		
16.2.8 Traffic and Transportation	Construction debris particularly site clearance, spoil removal and dirty water run off can have a significant impact on footpaths and roads adjoining a construction site, if not adequately dealt with and these matters will require to be fully addressed in the contractors CTMP, typically this includes wheel wash facilities at the site for egressing traffic and also external site road sweeping.		
16.2.9 Material Assets	Surface water, wastewater drainage and water supply for the proposed development is designed to comply with the Irish water code of practice, standard details, policies and guidelines and the requirements of Dublin County Council. Confirmation of feasibility for wastewater and water supply has been received from Irish Water see appendix 14.1. Mitigation measures proposed in relation to the drainage and water infrastructure include the following: <ol style="list-style-type: none"> 1. Adherence to the mitigation measures and monitoring set out in the Construction and Environmental Management Plan (CEMP) prepared by PUNCH Consulting Engineers and submitted with this application. Site inductions will include reference to the procedures and best practice as outlined in the Construction and Environmental Management Plan (CEMP). 2. The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. 3. The construction compound's potable water supply shall be located where it is protected from contamination by any construction activities or materials. 4. Identification of the location of services prior to excavation works commencing. 5. Consultation with relevant services providers in advance of works to ensure works are carried out to relevant standards and specifications. 6. Protection in place of all underground services for which diversions are not required. 7. Consultation and agreement with Irish Water on allowable wastewater discharge to the public sewer network. 8. Air testing of all new surface water and wastewater drainage lines 9. Pressure testing of all new watermains lines 10. All new foul drainage lines will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational. 		

	<ol style="list-style-type: none"> 11. Electrical supply connections to the existing power supply network for the proposed development will be coordinated with ESB Networks. All power supply related works will be carried out in accordance with ESB Networks relevant guidelines. 12. Gas supply, and the requirement for any alterations to the existing gas supply network for the proposed development, will be agreed in advance of construction with Gas Networks Ireland. All gas supply related works will be carried out in accordance with Gas Networks Ireland relevant guidelines. 13. Connections to the telecommunications network for the proposed development will be coordinated with carried out in accordance with utility provider’s guidelines. <p>During the construction phase of the proposed project, all possible provisions and precautions will be implemented in order to avoid disruptions to services in and surrounding the proposed site. These works will include coordination with the relevant utility and service providers in order to identify, as far as is possible, all services within the proposed works area, prior to any excavation works being carried out. Disruption to services in the area will be kept to a minimum and will only occur where unavoidable, as advised by the relevant service provider. Prior notification of any planned disruptions shall be given to all impacted service users, including information as to when the disruptions are scheduled to occur and the duration of any service disruptions.</p>
<p>16.2.10 Waste</p>	<p>A project specific RWMP has been prepared in line with the requirements of the guidance document issued by the DoEHLG. The site-specific RWMP will be updated and submitted prior to commencement of the construction phase which may refine the above waste estimates. Adherence to the high-level strategy presented in this R WMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the construction phase of the proposed development.</p> <p>In addition, the following mitigation measures will be implemented:</p> <ol style="list-style-type: none"> 1. Building materials will be chosen with an aim to ‘design out waste’. 2. 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: <ol style="list-style-type: none"> 1. Concrete rubble (including ceramics, tiles and bricks). 2. Plasterboard. 3. Metals. 4. Glass; and 5. Timber. 3. 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. 4. All waste materials will be stored in skips or other suitable receptacles in designated areas of the site. 5. 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). 6. A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works. 7. All construction staff will be provided with training regarding the waste management procedures. 8. All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal. 9. All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and 10. All waste leaving the site will be recorded and copies of relevant documentation maintained. <p>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 <i>Waste Management Act 1996</i>, as amended, associated Regulations, the <i>Litter Pollution Act 1997</i> and the <i>EMR Waste Management Plan (2015 - 2021)</i>. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources.</p>
<p>16.2.11 Cultural and Archaeological Heritage</p>	<p>All areas of the site have been extensively excavated. The archaeological potential for the area is negligible as a result of this no further archaeological input is recommended.</p>

16.3 OPERATIONAL PHASE

<p>Population and Human Health</p>	<p>The proposed development has been designed to avoid negative impacts on population and human health through the provision of various physical and social infrastructure as part of the development as are outlined in Chapter 3 of this EIAR.</p> <p>Chapter 9 Climate and Air Quality notes the proposal includes operational phase mitigation by design measures to minimise the impact on air quality and climate. These include thermally efficient glazing, thermal insulation, natural gas heating, inclusion of electric car charging points.</p> <p>Chapter 11 Traffic and Transportation notes that a Mobility Management Plan and Parking Strategy has been prepared for the proposed development with the aim of managing and mitigating the impacts of private vehicle usage and promote sustainable travel trends to and from the proposed development.</p> <p>No additional mitigation measures are considered necessary.</p>
<p>16.3.1 Biodiversity</p>	<p>Dry calcareous and neutral grassland / Scrub; Recolonising bare ground; Insects</p> <p>To mitigate for the loss of the diverse grassland and recolonising bare ground, which provides habitat for pollinating insects, the landscape masterplan provided by Park Hood Chartered Architects (drawing no. 7335—L-2005) incorporates pollinator friendly planting based on the “Pollinator Friendly Planting Code” in the “All Ireland Pollinator Plan 2015-2020. Native Irish wildflower meadows are proposed around the play area in the north next to Block F and in the south next to Block B, C and E.</p> <p>The areas of native wildflower meadow will only undergo a late cutting (after July 15th) once each year. This benefits invertebrate species which need highly structured grassland vegetation for feeding and refuge. It also allows for late-flowering plants to set seed.</p> <p>It is advisable to avoid cutting the whole meadow area at one time, but to spread the timing of the operation so as to avoid damaging the micro-fauna. Spreading cutting dates also prolongs the pollination phase of plants and the availability of nectar for invertebrates. For that reason, it is sensible to exclude from cutting a small proportion (5-10%) of the total area, cutting it the following summer. This should be done every year with a different part of the surface, on rotation, going back to any particular uncut patch of land every 4-6 years (Pearson et al., 2006; Calaciura and Spinelli, 2008).</p> <p>Very low cutting heights should be avoided, as there is a likelihood of excessive “scalping” resulting in the creation of bare patches in the grassland. These provide favourable areas for the invasion of undesirable species (Calaciura & Spinelli, 2008).</p> <p>Cut material can be left in place for a couple of days but should thereafter be removed to avoid nutrient enrichment of the grassland. Leaving the cut material in place is also considered to smother the grassland, depressing species richness (Crofts and Jefferson, 1999; Calaciura and Spinelli, 2008).</p> <p>Hedgehog, Pygmy Shrew, Badger, Bats, Breeding birds</p> <p>The landscape masterplan provided by Park Hood Chartered Architects (drawing no. 7335—L-2005) incorporates a wildlife corridor along the southern boundary and across the site at the back of Block F and G which connects areas to the south with areas to the north of the site. This wildlife corridor consists of trees and scrub to allow for safe commuting and foraging opportunities for mammals, bats and birds. It also provides nesting habitat for breeding birds.</p> <p>Below is a list of the native trees and scrub to be planted and their biodiversity benefits:</p> <ol style="list-style-type: none"> 1. Hazel <i>Corylus avellana</i> - Provides food for the caterpillars of moths, suppling local birds and bats with prey. Additionally, hazelnuts are eaten by Greater Spotted Woodpecker <i>Dendrocopos major</i>, Wood Pigeon <i>Columba palumbus</i> and small mammals. 2. Guelder Rose <i>Viburnum opulus</i> - The red berries are an important food source for birds and the shrub canopy provides shelter for a wide range of wildlife. The flowers are especially attractive to hoverflies. 3. Spindle <i>Euonymus europaeus</i> – The flowers provide nectar for pollinators and the leaves are eaten by caterpillars of moths and other insects. 4. Hawthorn <i>Crataegus monogyna</i> - Provides food for pollinators and caterpillars of moths, suppling local birds and bats with prey. The fruit haws are eaten by migrating birds, such as Redwings <i>Turdus iliacus</i> and Fieldfare <i>Turdus pilaris</i>, as well as small mammals. 5. Holly <i>Ilex aquifolium</i> - Provides dense cover and good nesting opportunities for birds, while its deep, dry leaf litter may be used by Hedgehogs and small mammals for hibernation. Also supports pollinator species providing prey for bats and birds. Its berries are also an important food source for birds in the winter.

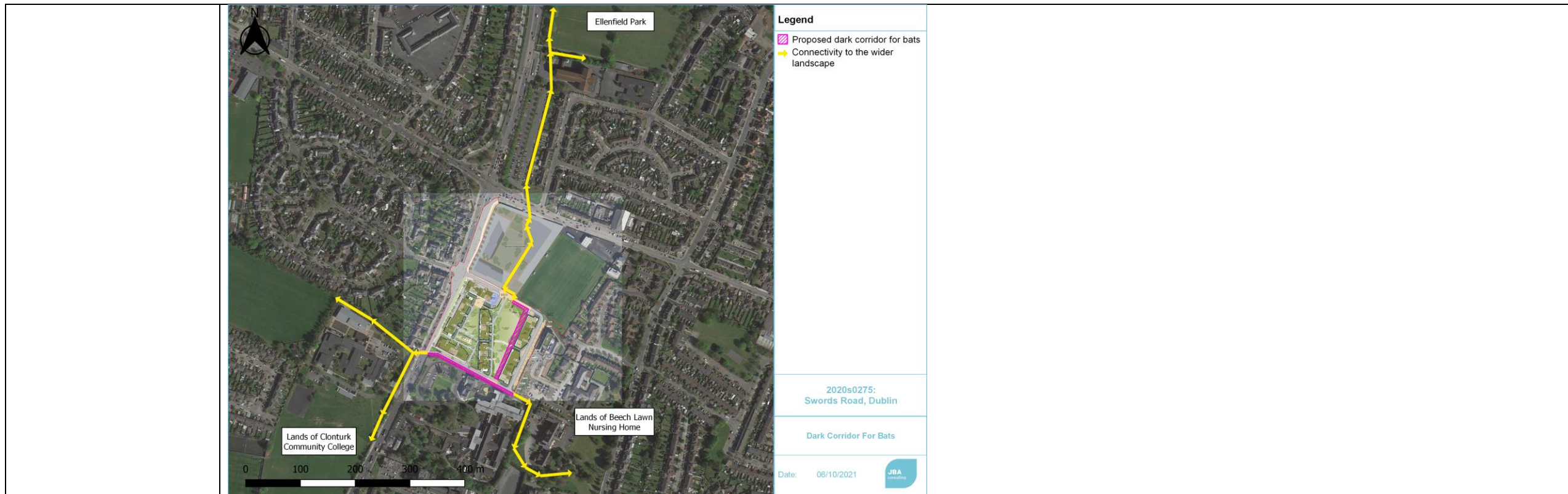
6. Elder *Sambucus nigra* - The flowers provide nectar for a variety of insects and the berries are eaten by birds and mammals.
7. Scots Pine *Pinus sylvestris* - Preferred by Red Squirrel *Sciurus vulgaris* for building dreys.
8. Silver Birch *Betula pendula* - Supports numerous moth species supplying bats with prey. This species is also preferred by Greater Spotted Woodpecker for nest building. This has knock-on benefits for both Red Squirrel and bats species which occupy abandoned nests.
9. Wild Cherry *Prunus avium* / Bird Cherry *Prunus padus* - Flowers support numerous pollinator species, while the fruits are often consumed by Badger, other small mammals and bird species
10. Goat Willow *Salix caprea* - Provides food for pollinators and caterpillars of moths, suppling local birds and bats with prey. Generally preferred by a number bird species for nesting.
11. Alder *Alnus glutinosa* - Supports diverse insect life, supplying local birds and bats with prey
12. Sessile Oak *Quercus petraea* - Supports diverse insect life, suppling local birds and bats with prey. Additionally, the acorns are consumed by Red Squirrel and Badger. This species is also preferred by Greater Spotted Woodpecker for nest building. This has knock-on benefits for both Red Squirrel and bats species which occupy abandoned nests.

Bats - Lighting

The lighting of the site is designed to minimise impact on bats using the site for commuting and foraging and incorporates a dark corridor which allows bats to commute between sites in the wider landscape.

The following should be incorporated into the lighting design:

1. Hours of illumination:
Site lighting should be switched off or at lower light output during inactive site hours where lighting is not necessary throughout the night; this would benefit the bats foraging and/or commuting in the locality. Additionally, lighting should be controlled by occupancy / motion sensors so that it will remain off / low if there is no pedestrian traffic nearby.
2. Light levels and type:
The specification and colour of light treatments, such as single bandwidth lights and no UV light are essential. LED luminaires should be used due to their sharp cut-off, lower intensity, and dimming capability. A warm white spectrum (2700K – 3000K) should be used to reduce the blue light component. Alternatively the LED luminaires could feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to the bats.
3. Column heights of lamp posts:
In order to reduce the amount of light spillage where it is not needed, the height of lamp columns should be restricted. A height of 6m or less is necessary to avert lighting impacts.
4. Dark corridors:
Taking into consideration all of the above recommended mitigation measures, a dark corridor (lighted in a bat-friendly manner) leading from one end of the site to the other, should be maintained for bats at all times (Figure below). This will allow for bats commuting through the site to do so safely. This dark corridor will be present along the southern boundary of the site and across from south to north at the back of Block F and G. The corridor will have bat-appropriate lighting and linear tree and shrub vegetation. The bat friendly, low intensity site lighting allows for the bats to commute along and through the site between habitats in the wider landscape, such as Ellenfield Park, lands of Beechlawn Nursing Home and Clonturk Community College.



16.3.2 Land, Soil and Geology

Accidental Spills and Leaks

At operational phase, impacts on land and soils from the development will be limited to risk of fuel or oil leaks from vehicles using the road network or the carparks. The risk posed by such instances will be mitigated with the surface water treatment measures outlined in detail in the Engineering Planning Report and drainage drawings submitted as part of this planning application. Joseph O’Reilly Consulting Civil & Structural Engineers have proposed a number of SUDS measures within the scheme including:

1. Green Roofs
2. Podium Green Areas over carpark
3. Landscaped Areas/green gardens
4. Permeable Paves parking spaces & footpaths
5. Filter drains/Infiltration strips alongside impermeable surfaces where applicable
6. Underground attenuated storage systems
7. Hydrobrake Flow Control
8. Petrol Interceptor

These SuDS measures reduce the proposed developments reliance on attenuation tanks to reduce peak run-off flow rates and also treat stormwater to improve quality through a treatment stream prior to discharge to the wider network and environment. Treatment of surface water through these SuDS measures (e.g. permeable paving) and petrol interceptors prior to discharge from the site will mitigate any potentially harmful impacts.

Integrity of Material Assets

The material assets (surface water, foul water and watermain networks) will be pressure tested to relevant Dublin City Council and Irish Water standards prior to completion of the works. The drainage networks will also be CCTV surveyed and reviewed to ensure there are no defects. These test measures will ensure to a reasonable degree that the pipes have been installed to the required standard and the risk of leakage will be greatly reduced.

Traffic and Transportation

The permanent design for the site – consisting of sealed roads and basement structure - will protect the existing soil and geological environment during operation.

Water and Hydrology

The material assets are to be constructed in strict accordance with the relevant building standards and to the requirements of the relevant statutory authority’s code of practise to mitigate the risk of pipe leakage at the operational phase.

Waste Management

	During the operational stage, runoff from waste storage areas will be collected by gullies and discharged to the foul drainage system on site. This drainage shall not be allowed drain to ground or to the surface water network.
16.3.3 Hydrology	<p>SuDS measures will intercept and attenuate surface water on site. The surface water will be passed through petrol interceptors and other SuDS measures that will clean the surface water. The water will be discharged to the surface water drainage system at a rate of 1.6l/s to Swords Road and at a rate of 4.0l/s to High Park.</p> <p>The material assets (surface water, foul water and watermain networks) will be pressure tested to relevant Dublin City Council and Irish Water standards prior to completion of the works. The drainage networks will also be CCTV surveyed and reviewed to ensure there are no defects. These test measures will ensure to a reasonable degree that the pipes have been installed to the required standard and the risk of leakage will be greatly reduced.</p>
16.3.4 Noise and Vibration	<p>The Proposed Development has been designed to ensure that suitable glazing is selected so that desirable internal noise conditions are achieved. The assessment in Chapter 8 applies a simple calculation method to ensure that the required level of noise attenuation can be achieved by glazing. The glazing scheme will be finalised in the detailed acoustic design of the Proposed Development.</p> <p>It is assumed that the building services plant will be designed to achieve the operational limits consistent with the requirements of BS 4142 which may require mitigation to be incorporated into the fixed plant design (see section 'Methodology for Determining Operational Effects – Building Services and Plant Noise'). Should the noise exhibit any such acoustic features then the relevant penalty/ correction should be applied in accordance with BS 4142 to ensure that the resultant rating level falls within the limit levels.</p>
16.3.5 Air and Climate	<p>No additional mitigation measures are required as the operational phase of the proposed development as it is predicted to have an imperceptible impact on ambient air quality and climate.</p> <p>The operational phase mitigation by design measures to minimise the impact of the development on air quality and climate are as follows:</p> <p><u>Mitigation Measures (Operational)</u></p> <ol style="list-style-type: none"> 1. Thermally efficient glazing systems on all units 2. Mechanical Ventilation and Heat Recovery (MVHR) systems or equivalent installed in all apartments 3. Thermal insulation of walls and roof voids of all units 4. Natural Gas heating in all units 5. Inclusion of electric car charging points to encourage electric vehicle ownership
16.3.6 Landscape and Visual Impact	Specific operational stage landscape and visual mitigation is not deemed necessary in this instance, as the building and landscape design that contributes to generally positive landscape and visual effects is embedded within the design of the development that has been assessed herein.
16.3.7 Traffic and Transportation	<p>In order to ameliorate the operational impacts of the proposed development, this application provides a reduced parking provision to that of the extant permission onsite, thus a reduction in expected vehicle trips would be resultant. The reduction of car parking spaces is proposed to reduce the on-site residents' car ownership and therefore the expected impacts on the AM and PM peak period trips.</p> <p>A Mobility Management Plan and Parking Strategy have been prepared alongside this application to manage and mitigate the impacts of private vehicle usage and promote sustainable travel trends to and from the proposed development.</p> <p>Further to this, the proposed complete signalisation of the N1/Iveragh Road/Site Access junction should allow for greater safety in pedestrian crossing of all arms of the road, as existing pedestrian crossings at Iveragh Road are provided as drop kerb crossing points and only one crossing point is provided along the N1 at the existing signals.</p>
16.3.8 Material Assets	<p>All sustainable drainage systems will be either maintained by the applicant or, where taken in charge, by the local authority. Regular maintenance of the SuDS systems will maintain their function of treating surface water prior to discharge. This will prevent silt build-up and other contaminant discharge to the surface water network. Regular maintenance of the attenuation storage and flow control device will maintain controlled discharge of stormwater in rainfall events and prevent inundation of the surface water system. The site watermain system will be metered as directed by Irish Water to facilitate detection of leakage and prevent ongoing water loss. All new foul drainage lines will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational. On completion of the construction phase no further mitigation measures are proposed in relation to the electrical, gas and telecommunications infrastructure. Energy efficient appliances for lighting and heating will be installed to minimise electricity consumption where possible.</p> <p>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 which will also reduce foul outflows. JOR Consulting Engineers have received a Confirmation of Feasibility from Irish Water for the proposed development confirming a future connection is feasible.</p>

<p>16.3.9 Waste</p>	<p>An Operational Waste Management Plan (OWMP) has been prepared for the development. The plan will seek to ensure the development contributes to the targets outlined in the Eastern Midlands Regional (EMR) Waste Management Plan 2015 – 2021. Mitigation measures proposed to manage impacts arising from wastes generated during the operation of the proposed development are summarised below.</p> <p>All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site in accordance with the <i>Dublin City Development Plan 2016 – 2022</i>.</p> <table border="1"> <thead> <tr> <th colspan="4">Waste Volume (m³/week)</th> </tr> <tr> <th>Waste type</th> <th>Residential Units (Combined)</th> <th>Café Unit</th> <th>Creche Unit</th> </tr> </thead> <tbody> <tr> <td>Organic Waste</td> <td>6.03</td> <td>0.10</td> <td>0.05</td> </tr> <tr> <td>Dry Mixed Recyclables</td> <td>44.17</td> <td>0.23</td> <td>2.06</td> </tr> <tr> <td>Glass</td> <td>1.17</td> <td>0.01</td> <td>0.01</td> </tr> <tr> <td>Mixed Non Recyclable</td> <td>24.48</td> <td>0.30</td> <td>0.91</td> </tr> <tr> <td>Total</td> <td>75.84</td> <td>0.64</td> <td>3.03</td> </tr> </tbody> </table> <p>All waste leaving the site will be recycled or recovered, with the exception of those waste streams where appropriate recycling/recovery facilities are currently not available. All waste leaving the site will be transported by suitable permitted contractors and taken to suitably permitted or licenced facilities. All waste leaving the site will be recorded and copies of relevant documentation maintained. Hazardous waste may be generated from WEEE, batteries, fluorescent tubes, and cleaning products. Any waste classed as hazardous will be required to be taken to a specialise waste company e.g. Rilta.</p> <p>All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site in accordance with the <i>Dublin City Council Development Plan 2016 – 2022</i>.</p> <p>In addition, the following mitigation measures will be implemented:</p> <ol style="list-style-type: none"> 6. On-site segregation of all waste materials into appropriate categories including (but not limited to): <ol style="list-style-type: none"> 1. Organic/catering waste (including garden waste from landscaping activities). 2. Dry Mixed Recyclables. 3. Mixed Non-Recyclable Waste. 4. Glass. 5. Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment. 6. Batteries (non-hazardous and hazardous) 7. Fluorescent bulb tubes and other mercury containing waste (if arising). 8. Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); and 7. 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. 8. 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. 9. All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and <p>These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the <i>Waste Management Act 1996</i>, as amended, and all associated Regulations. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.</p>	Waste Volume (m ³ /week)				Waste type	Residential Units (Combined)	Café Unit	Creche Unit	Organic Waste	6.03	0.10	0.05	Dry Mixed Recyclables	44.17	0.23	2.06	Glass	1.17	0.01	0.01	Mixed Non Recyclable	24.48	0.30	0.91	Total	75.84	0.64	3.03
Waste Volume (m ³ /week)																													
Waste type	Residential Units (Combined)	Café Unit	Creche Unit																										
Organic Waste	6.03	0.10	0.05																										
Dry Mixed Recyclables	44.17	0.23	2.06																										
Glass	1.17	0.01	0.01																										
Mixed Non Recyclable	24.48	0.30	0.91																										
Total	75.84	0.64	3.03																										
<p>16.3.10 Cultural and Archaeological Heritage</p>	<p>No mitigation is required at operational stage of the development.</p>																												

