



Enviroguide
CONSULTING

Volume 2

Environmental Impact Assessment Report

FOR

Mixed Use Residential Development

AT

Lands to the East of St. Paul's College, Sybil Hill Road, Raheny,
Dublin 5

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ON BEHALF OF

Raheny 3 Limited Partnership

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TABLE OF CONTENTS

1	INTRODUCTION AND METHODOLOGY	1
1.1	Introduction	1
1.1.1	<i>Quality Assurance and Competence</i>	1
1.2	Definition of EIA and EIAR	1
1.3	EIA Legislation	3
1.4	EIA Guidelines	3
1.5	Screening for EIA	5
1.6	Scope of the EIAR	5
1.7	Purpose and Objectives of the EIAR	6
1.8	Format and Structure of this EIAR	7
1.9	Methodology Used to Produce this EIAR	9
1.10	EIAR Project Team	11
1.11	Non-Technical Summary	13
1.12	Links between EIAR and Appropriate Assessment	13
1.13	Availability of EIAR Documents	14
1.14	Statement of Difficulties Encountered	14
1.15	Quotations	14
2	PROJECT DESCRIPTION & DESCRIPTION OF ALTERNATIVES	15
2.1	Introduction and Terms of Reference	15
2.2	Site Location and Description	15
2.3	Site History / Background	16
2.4	Project Overview	16
2.5	Construction Phase	19
2.6	Statutory Planning Context	19
2.6.1	<i>National</i>	19
2.6.2	<i>Regional</i>	19
2.6.3	<i>Local</i>	19
2.7	Description of Alternatives	20

2.7.1	<i>Introduction</i>	20
2.7.2	<i>Alternative Locations</i>	21
2.7.3	<i>Alternative Uses</i>	21
2.7.4	<i>Alternative Design & Layouts</i>	22
2.7.5	<i>Alternative Process</i>	26
2.8	The Existence of the Project	26
3	PLANNING AND POLICY CONTEXT	28
3.1	National and Regional Planning Policy Context	29
3.1.1	<i>National Planning Context</i>	29
3.1.2	<i>Urban Development and Building Heights Guidelines for Planning Authorities (2018)</i>	31
3.2	Housing for All A New Housing Plan for Ireland (2021)	32
3.2.1	<i>Design Manual for Urban Roads & Streets (DMURS) (2013)</i>	33
3.2.2	<i>National Policy Position on Climate Action & Low Carbon Development and Climate Act 2021</i>	33
3.2.3	<i>Regional Planning Context</i>	38
3.2.4	<i>Local Level</i>	39
3.3	The EIA Directive	40
4	POPULATION AND HUMAN HEALTH	43
4.1	Introduction	43
4.1.1	<i>Quality Assurance and Competence</i>	43
4.2	Study Methodology	43
4.2.1	<i>Information Sources</i>	45
4.3	The Existing and Receiving Environment (Baseline Situation)	48
4.4	Characteristics of the Proposed Development	51
4.4.1	<i>Population and Demographic Analysis</i>	51
4.4.2	<i>Population and Age</i>	52
4.4.3	<i>Economic Activity & Employment</i>	54
4.4.4	<i>Travel & Commuting</i>	57
4.4.5	<i>Community & Amenities</i>	59
4.4.6	<i>Landscape and Visual</i>	61
4.4.7	<i>Human Health</i>	62
4.4.8	<i>Social Health</i>	62
4.5	Potential Impact of the Proposed Development	64
4.5.1	<i>Construction Phase</i>	64
4.5.2	<i>Operational Phase</i>	67
4.5.3	<i>Potential Cumulative Impacts</i>	70
4.5.4	<i>“Do Nothing” Impact</i>	73
4.6	Avoidance, Remedial & Mitigation Measures	74
4.6.1	<i>Construction Phase</i>	74
4.6.2	<i>Operational Phase</i>	74
4.6.3	<i>“Worst Case” Scenario</i>	74

4.7	Residual Impacts	74
4.8	Monitoring	74
4.8.1	<i>Construction Phase</i>	74
4.8.2	<i>Operational Phase</i>	74
4.9	Interactions	74
4.9.1	<i>Noise</i>	74
4.9.2	<i>Air</i>	75
4.9.3	<i>Land and Soil</i>	75
4.9.4	<i>Hydrology</i>	75
4.9.5	<i>Landscape and Visual</i>	75
4.9.6	<i>Material Assets – Waste and Utilities</i>	75
4.9.7	<i>Material Assets: Traffic</i>	76
4.10	Difficulties Encountered When Compiling	76
4.11	References	76
5	BIODIVERSITY	78
5.1	Introduction	78
5.1.1	<i>Quality Assurance and Competence</i>	78
5.2	Relevant Legislation	79
5.2.1	<i>National Legislation</i>	79
5.2.2	<i>EU Legislation</i>	81
5.2.3	<i>International Conventions</i>	82
5.3	Study Methodology	82
5.3.1	<i>Desk Study</i>	82
5.3.2	<i>Field Surveys</i>	83
5.3.3	<i>Assessment</i>	89
5.4	The Existing and Receiving Environment (Baseline Situation)	93
5.4.1	<i>Site Overview</i>	93
5.4.2	<i>Designated Sites</i>	94
5.4.3	<i>Habitats</i>	102
5.4.4	<i>Flora and Fauna</i>	105
5.4.5	<i>Summary of Ecological Evaluation</i>	125
5.5	Characteristics of the Proposed Development	128
5.6	Potential Impact of the Proposed Development	129
5.6.1	<i>Construction Phase</i>	129
5.6.2	<i>Operational Phase</i>	134
5.6.3	<i>Potential Cumulative Impacts</i>	140
5.6.4	<i>“Do Nothing” Impact</i>	141
5.7	Avoidance, Remedial & Mitigation Measures	141
5.7.1	<i>Mitigation 1: Controlled Vegetation Removal</i>	141
5.7.2	<i>Mitigation 2: Badgers</i>	142
5.7.3	<i>Mitigation 3: Bat-friendly Tree Felling & Pre-demolition Survey</i>	146

5.7.4	<i>Mitigation 4: Bat-friendly Lighting</i>	147
5.7.5	<i>Mitigation 5: Habitat Protection</i>	148
5.7.6	<i>Mitigation 6: Naniken Stream and European Eel</i>	149
5.7.7	<i>Mitigation 7: Noise Management</i>	151
5.7.8	<i>Mitigation 8: Reduction of Construction hazards</i>	152
5.7.9	<i>"Worst Case" Scenario</i>	152
5.8	Residual Impacts	152
5.9	Monitoring	159
5.9.1	<i>Construction Phase</i>	159
5.9.2	<i>Operational Phase</i>	159
5.10	Interactions	160
5.10.1	<i>Hydrology</i>	160
5.10.2	<i>Landscape and Visual</i>	160
5.10.3	<i>Land and Soil</i>	160
5.10.4	<i>Air Quality and Climate</i>	160
5.10.5	<i>Material Assets: Waste and Utilities</i>	161
5.11	Difficulties Encountered When Compiling	161
5.12	References	161
6	LAND AND SOIL	165
6.1	Introduction	165
6.2	Study Methodology	165
6.3	The Existing and Receiving Environment (Baseline Situation)	165
6.3.1	<i>Desktop Study</i>	166
6.3.2	<i>Ground Investigations</i>	168
6.4	Characteristics of the Proposed Development	169
6.5	Potential Impact of the Proposed Development	170
6.5.1	<i>Construction Phase</i>	170
6.5.2	<i>Operational Phase</i>	171
6.5.3	<i>"Do Nothing" Impact</i>	171
6.6	Avoidance, Remedial & Mitigation Measures	171
6.6.1	<i>Construction Phase</i>	171
6.6.2	<i>Operational Phase</i>	172
6.7	Residual Impacts	172
6.7.1	<i>Construction Phase</i>	172
6.7.2	<i>Operational Phase</i>	173
6.7.3	<i>"Worst Case" Scenario</i>	173
6.8	Monitoring	173
6.8.1	<i>Construction Phase</i>	173
6.8.2	<i>Operational Phase</i>	173

6.9	Reinstatement	174
6.10	Interactions	174
6.10.1	<i>Population & Human Health</i>	174
6.10.2	<i>Water</i>	174
6.10.3	<i>Climate (Air Quality & Climate Change)</i>	174
6.10.4	<i>Air (Noise & Vibration)</i>	174
6.10.5	<i>Waste Management</i>	174
6.10.6	<i>Biodiversity</i>	174
6.10.7	<i>Material Assets (Transport)</i>	174
6.11	Difficulties Encountered When Compiling	175
6.12	References	175
7	WATER (HYDROLOGY AND HYDROGEOLOGY)	176
7.1	Introduction	176
7.1.1	<i>Quality Assurance and Competence</i>	176
7.1.2	<i>Description of the Proposed Development</i>	176
7.2	Study Methodology	177
7.2.1	<i>Regulations and Guidelines</i>	177
7.2.2	<i>Phased Approach</i>	178
7.2.3	<i>Description of Importance of the Receiving Environment</i>	180
7.2.4	<i>Description and Assessment of Potential Impact</i>	180
7.3	The Existing and Receiving Environment (Baseline Situation)	181
7.3.1	<i>Site Location and Description</i>	181
7.3.2	<i>Topography</i>	182
7.3.3	<i>Rainfall</i>	182
7.3.4	<i>Soil, Geology</i>	183
7.3.5	<i>Regional Hydrogeology</i>	184
7.3.6	<i>Site Hydrogeology and Groundwater Levels</i>	186
7.3.7	<i>Hydrology</i>	187
7.3.8	<i>Site Drainage</i>	187
7.3.9	<i>Flooding</i>	187
7.3.10	<i>Water quality</i>	188
7.3.11	<i>Water Use and Drinking Water Source Protection</i>	191
7.3.12	<i>Water Framework Directive Status</i>	192
7.3.13	<i>Designated Sites</i>	194
7.3.14	<i>Importance of the Receiving Environment</i>	196
7.4	Characteristics of the Proposed Development	196
7.4.1	<i>General Description</i>	196
7.4.2	<i>Construction Phase</i>	197
7.4.3	<i>Operational Phase</i>	198
7.5	Potential Impact of the Proposed Development	199
7.5.1	<i>Construction Phase</i>	199
7.5.2	<i>Operational Phase</i>	201
7.5.3	<i>Potential Cumulative Impacts</i>	204
7.5.4	<i>“Do Nothing” Impact</i>	205

7.6	Avoidance, Remedial & Mitigation Measures	206
7.6.1	<i>Construction Phase</i>	206
7.6.2	<i>Operational Phase</i>	211
7.6.3	<i>“Worst Case” Scenario</i>	212
7.6.4	<i>Human Health</i>	212
7.6.5	<i>Water Framework Directive</i>	213
7.7	Residual Impacts	213
7.8	Monitoring	218
7.8.1	<i>Construction Phase</i>	218
7.8.2	<i>Operational Phase</i>	218
7.9	Interactions	218
7.9.1	<i>Population and Human Health</i>	218
7.9.2	<i>Material Assets - Water</i>	218
7.9.3	<i>Land, Soil, Geology and Hydrogeology</i>	218
7.9.4	<i>Biodiversity</i>	218
7.9.5	<i>Traffic</i>	219
7.10	Difficulties Encountered When Compiling	219
7.11	References	220
8	AIR QUALITY AND CLIMATE	222
8.1	Introduction	222
8.1.1	<i>Ambient Air Quality Standards</i>	222
8.1.2	<i>Climate Agreements</i>	224
8.2	Study Methodology	227
8.3	The Existing and Receiving Environment (Baseline Situation)	228
8.3.1	<i>Air Quality</i>	228
8.3.2	<i>Macroclimate</i>	232
8.3.3	<i>Microclimate</i>	232
8.4	Characteristics of the Proposed Development	235
8.5	Potential Impact of the Proposed Development	236
8.5.1	<i>Potential Impacts on Air Quality</i>	236
8.5.2	<i>Potential Impacts on Climate</i>	252
8.5.3	<i>Potential Cumulative Impacts</i>	255
8.5.4	<i>“Do Nothing” Impact</i>	259
8.6	Avoidance, Remedial & Mitigation Measures	259
8.6.1	<i>Air Quality</i>	259
8.6.2	<i>Climate</i>	262
8.7	Residual Impacts	262
8.8	Monitoring	262

8.9	Interactions	263
8.9.1	<i>Population and Human Health</i>	263
8.9.2	<i>Biodiversity</i>	263
8.9.3	<i>Land and Soil</i>	263
8.9.4	<i>Traffic</i>	263
8.10	Difficulties Encountered When Compiling	263
8.11	References	264
9	NOISE & VIBRATION	266
9.1	Introduction	266
9.1.1	<i>Competence</i>	266
9.2	Noise	266
9.3	Study Methodology	268
9.3.1	<i>Guidance, Policy and Legislation</i>	271
9.4	The Existing and Receiving Environment (Baseline Situation)	271
9.4.1	<i>Quiet Area Screening</i>	272
9.4.2	<i>Recommended Noise Limits</i>	273
9.4.3	<i>Recommended Vibration Limits</i>	274
9.5	Characteristics of the Proposed Development	274
9.6	Potential Impact of the Proposed Development	275
9.6.1	<i>Noise Sensitive Locations</i>	275
9.6.2	<i>Construction Phase</i>	276
9.6.3	<i>Operational Phase</i>	279
9.6.4	<i>Potential Cumulative Impacts</i>	280
9.6.5	<i>“Do Nothing” Impact</i>	288
9.7	Avoidance, Remedial & Mitigation Measures	288
9.7.1	<i>Construction Phase</i>	288
9.7.2	<i>Operational Phase</i>	291
9.7.3	<i>“Worst Case” Scenario</i>	291
9.8	Residual Impacts	291
9.9	Monitoring	292
9.10	Interactions	292
9.10.1	<i>Population and Human Health</i>	292
9.10.2	<i>Biodiversity</i>	292
9.10.3	<i>Land and Soil</i>	292
9.10.4	<i>Traffic</i>	293
9.11	Difficulties Encountered When Compiling	293
9.12	References	293

10	LANDSCAPE/TOWNSCAPE AND VISUAL ASSESSMENT	295
10.1	Introduction	295
10.1.1	<i>Statement of Authority</i>	295
10.2	Study Methodology	295
10.2.1	<i>Landscape/townscape Impact Assessment Criteria</i>	296
10.2.2	<i>Visual Impact Assessment Criteria</i>	299
10.2.3	<i>Visual Impact Magnitude</i>	301
10.3	The Existing and Receiving Environment	303
10.3.1	<i>Baseline Environment</i>	304
10.3.2	<i>Planning Policy Context</i>	311
10.4	Characteristics of the Proposed Development	316
10.4.1	<i>Project Description</i>	316
10.5	Potential Impact of the Proposed Development	317
10.5.1	<i>Landscape Impacts of the Proposed Development</i>	317
10.5.2	<i>Visual Impacts of the Proposed Development</i>	321
10.5.3	<i>Cumulative Impact</i>	348
10.5.4	<i>Overall Significance of Impact</i>	349
10.6	Mitigation Measures	349
10.6.1	<i>Construction Phase</i>	349
10.6.2	<i>Operational Phase</i>	349
10.7	Residual Impacts	350
10.8	Monitoring	350
10.8.1	<i>Construction Phase</i>	350
10.8.2	<i>Operational Phase</i>	350
10.9	Interactions	350
10.9.1	<i>Archaeology and Cultural Heritage</i>	350
10.9.2	<i>Biodiversity</i>	350
10.9.3	<i>Population and Human Health</i>	350
10.10	Difficulties Encountered When Compiling	351
10.11	References	351
11	ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE	352
11.1	Introduction	352
11.1.1	<i>Archaeological and Cultural heritage</i>	353
11.2	Methodology	354
11.2.1	<i>Archaeology and Cultural Heritage Assessment Methodology</i>	354
11.2.2	<i>Desk-Based Assessment</i>	354
11.2.3	<i>Site Inspection</i>	354
11.2.4	<i>Guidelines, Legislation and Standards</i>	354
11.2.5	<i>Architectural Heritage Assessment Methodology</i>	355

11.3	Existing receiving environment	356
11.3.1	<i>The Site</i>	356
11.3.2	<i>Conservation context</i>	357
11.3.3	<i>Archaeological and historical background with cartographic analysis</i>	357
11.3.4	<i>Historic Period</i>	359
11.3.5	<i>National Monuments</i>	369
11.3.6	<i>Record of Monuments and Places (RMP) and Sites and Monuments Record (SMR)</i>	369
11.3.7	<i>Archaeological investigations in the immediate vicinity of the proposed development</i>	370
11.3.8	<i>Topographical files</i>	371
11.3.9	<i>National Inventory of Architectural Heritage</i>	371
11.3.10	<i>The Record of Protected Structures</i>	372
11.3.9	<i>Aerial Imagery</i>	372
11.3.10	<i>Geophysical survey</i>	373
11.3.11	<i>Architectural Site Survey</i>	374
11.3.12	<i>Archaeological & Cultural Heritage Site Survey</i>	381
11.4	Characteristics of the Proposed Development	386
11.5	Potential impact of the Proposed Development	386
11.5.1	<i>Potential Architectural Impact of the Proposed Development</i>	386
11.5.2	<i>Predicted impact of access road on Sybil Hill House</i>	387
11.5.3	<i>Potential impact of residential development on Sybil Hill House</i>	388
11.5.4	<i>Potential impact of residential development on brick-faced wall</i>	388
11.5.5	<i>Predicted impact of residential development on St Anne's Park conservation area</i>	389
11.5.6	<i>Do-nothing scenario</i>	390
11.5.7	<i>Potential archaeological impact of the Proposed Development</i>	390
11.5.8	<i>Predicted archaeological impact of the proposed development</i>	394
	<i>Predicted impact on AAP3</i>	395
11.5.9	<i>Do-nothing scenario</i>	396
11.6	Avoidance, Remedial and Mitigation Measures	396
11.6.1	<i>Architecture</i>	396
11.6.2	<i>Archaeology and Cultural Heritage</i>	396
11.7	Residual impacts	397
11.8	Monitoring	397
11.9	Interactions	397
11.9.1	<i>Landscape and Visual</i>	397
11.10	Difficulties encountered in compiling this assessment	398
11.11	References	398
12	MATERIAL ASSETS	402
12.1	Traffic	402
12.1.1	<i>Introduction</i>	402
12.1.2	<i>Study Methodology</i>	402
12.1.3	<i>The Existing and Receiving Environment (Baseline Situation)</i>	403
12.1.4	<i>Characteristics of the Proposed Development</i>	418
12.1.5	<i>Potential Impact of the Proposed Development</i>	427

12.1.6	<i>Avoidance, Remedial & Mitigation Measures</i>	438
12.1.7	<i>Residual Impacts</i>	441
12.1.8	<i>Monitoring</i>	441
12.1.9	<i>Interactions</i>	443
12.1.10	<i>Difficulties Encountered When Compiling</i>	443
12.1.11	<i>References</i>	443
12.2	Waste and Utilities	444
12.2.1	<i>Introduction</i>	444
12.2.2	<i>Study Methodology</i>	444
12.2.3	<i>The Existing and Receiving Environment (Baseline Situation)</i>	448
12.2.4	<i>Characteristics of the Proposed Development</i>	454
12.2.5	<i>Potential Impact of the Proposed Development</i>	455
12.2.6	<i>Avoidance, Remedial & Mitigation Measures</i>	466
12.2.7	<i>Residual Impacts</i>	467
12.2.8	<i>Monitoring</i>	467
12.2.9	<i>Interactions</i>	467
12.2.10	<i>Difficulties Encountered When Compiling</i>	468
12.2.11	<i>References</i>	468
13	RISK MANAGEMENT	470
13.1	Study Methodology	470
13.1.1	<i>Scope and Context</i>	470
13.2	Predicted Impacts	472
13.3	Management Plans	479
13.3.1	<i>Fire Safety and Emergency Response Plans</i>	479
13.3.2	<i>Traffic Management Plan</i>	480
13.3.3	<i>Public Safety Zones</i>	480
13.4	Residual Impacts	481
13.5	Monitoring	481
13.6	Conclusions	481
13.7	Difficulties Encountered When Compiling	481
13.8	References	482
14	INTERACTIONS	483
14.1	Introduction	483
14.2	Study Methodology	483
14.3	Interactions	483
	<i>Population and Human Health</i>	486
	<i>Biodiversity</i>	488
	<i>Land and Soil</i>	490
	<i>Hydrology and Hydrogeology</i>	492

<i>Air Quality and Climate</i>	494
<i>Noise and Vibration</i>	496
<i>Landscape and Visual Assessment</i>	498
<i>Archaeology and Cultural Heritage</i>	499
<i>Material Assets - Traffic, Waste and Utilities</i>	500
14.4 References	501
15 MITIGATION AND MONITORING MEASURES	502
15.1 Introduction	502
15.2 Summary of Mitigation Measures	503
15.2.1 <i>Population and Human Health</i>	503
15.2.2 <i>Biodiversity</i>	504
15.2.3 <i>Land and Soils</i>	517
15.2.4 <i>Hydrology</i>	520
15.2.5 <i>Air Quality</i>	527
15.2.6 <i>Noise & Vibrations</i>	529
15.2.7 <i>Landscape & Visual</i>	533
15.2.8 <i>Architecture , Archaeology and Cultural Heritage</i>	534
15.2.9 <i>Materials Assets: Waste and Utilities</i>	536
15.2.10 <i>Traffic</i>	538

LIST OF TABLES

Table 1-1: Structure of the EIAR.....	8
Table 1-2: Methodology Employed to Produce each EIAR Chapter.....	10
Table 1-3: EIAR Project Team.....	11
Table 4-1: Definition of Quality of Effects	47
Table 4-2: Definition of Significance of Effects.....	47
Table 4-3: Definition of Duration of Effects.....	48
Table 4-4: Population Change in Greater Dublin Area, 2016 to 2022 Census (Source: CSO)	52
Table 4-5: City, City & Suburbs and National Population Categorisation by Age.....	52
Table 4-6: Age Profile of the Clontarf Local Electoral Area.....	53
Table 4-7: Economic Status of the Population Aged 15+ in 2016 (Source: CSO).....	55
Table 4-8: Number of Persons on Live Register, Kilbarrack (Source: CSO).....	56
Table 4-9: Level of Education Clontarf LEA (Source CSO)	56
Table 4-10: Area of Study Clontarf LEA (Source CSO)	57
Table 4-11: Commuting Methods to School and College from Clontarf LEA.....	58
Table 4-12: Commuting to Work from Clontarf LEA.....	58
Table 4-13: Commuting Times for Clontarf LEA.....	59
Table 4-14: Health Status of Clontarf LEA	62
Table 5-1 Description of values for ecological resources based on geographic hierarchy of importance (NRA, 2009b)	90
Table 5-2 Definition of Quality of Effects	92
Table 5-3 Definition of Significance of Effects.....	92
Table 5-4 Definition of Duration of Effects.....	93
Table 5-5 European sites located within 15km of the Site of the Proposed Development	95
Table 5-6 Natural heritage areas and proposed natural heritage areas within 5km of the Site of the Proposed Development	99
Table 5-7 Records of Rare or Protected Flora for the Surrounding 10KM (O23) Grid Square, from the NBDC.....	107
Table 5-8 Records of Invasive Species of Flowering Plant from the relevant 2KM Grid Square (O23D) from the NBDC.....	109
Table 5-9 Summary of bat activity recorded on 7 th of September 2021 and the 26 th of July 2022. (Non bat “noise” records removed).....	113
Table 5-10 Bat roost potential and commuting/foraging suitability of the trees marked for felling as part of the Proposed Development.....	118
Table 5-11. Bird species recorded within the vicinity of the Site during the breeding bird surveys in 2019 & 2021.....	121
Table 5-12. Evaluation of potential ecological sensitivities within the vicinity of Site of the Proposed Development.....	126

Table 5-13 Summary of Potential Impacts on KER(s), Mitigation Proposed and Residual Impacts.	154
Table 6-1: Groundwater Monitoring Levels	169
Table 6-2: Schedule of Accommodation	170
Table 7-1 Criteria for Rating Site Importance of Hydrogeological Features (IGI,2003)	180
Table 7-2 Assessment of Potential Impacts Terminology and Methodology (EPA, 2022)	181
Table 7-3 Long Term Mean Monthly Rainfall Data (mm) (Walsh, 2012)	182
Table 7-4 Average Potential Evapotranspiration (Met Eireann, 2022)	183
Table 7-5 Groundwater Levels Measured Onsite (GIL, 2015)	186
Table 7-6 Surface Water Quality Monitoring Stations	188
Table 7-7 Surface Water Quality Results for SW1	189
Table 7-8: Surface Water Quality Results for SW2	190
Table 7-9: WFD Risk and Water body Status	193
Table 7-10 Designated and Protected Sites with Hydraulic Connection to the Site	194
Table 7-11 Groundwater Monitoring Levels and Underground Structure Depth	198
Table 7-12 Summary of Residual Impacts	214
Table 8-1: Limit Values of Cleaner Air for Europe (CAFE) Directive 2008/50/EC (Source: EPA, 2020)	223
Table 8-2: Concentrations of NO ₂ at Zone A Monitoring Stations	229
Table 8-3: Concentrations of PM ₁₀ at Zone A Monitoring Stations	231
Table 8-4: Monthly Rainfall Values (mm) for Dublin Airport Weather Station from January 2018 to December 2021 (Source: Met Eireann)	233
Table 8-5: Assessment Criteria for the Impact of Dust Emissions from Construction Activities, with Standard Mitigation in Place	237
Table 8-6: Percentage Distribution of Wind Speeds and Direction at Dublin Airport (2016-2020)	238
Table 8-7: Indicative Criteria for Requiring an Air Quality Assessment (Source: IAQM, 2017)	240
Table 8-8: Receiving Environment Sensitivity (Source: DMRB LA 105)	241
Table 8-9: Sensitive Receptors	243
Table 8-10: Traffic Data Applied to the DMRB Model	243
Table 8-11: Definition of Impact Magnitude for Changes in Ambient Pollutant Concentrations (Source: Adapted from TII, 2011)	246
Table 8-12: Air Quality Impact Descriptors for Changes to Annual Mean NO ₂ and PM ₁₀ Concentrations at Receptor (Source: Adapted from TII, 2011)	247
Table 8-13: Air Quality Impact Descriptors for Changes to Number of Days with PM10 Concentration Greater than 50 µg/m ³ at a Receptor (Source: TII, 2011)	248
Table 8-14: Factors to Consider when Determining Air Quality Significance (Source: Adapted from TII, 2011)	249

Table 8-15: Baseline NO ₂ and PM ₁₀ Concentrations (2021).....	250
Table 8-16: Predicted Annual Mean Concentrations of NO ₂ (Opening Year 2025).....	251
Table 8-17: Predicted Annual Mean Concentrations of NO ₂ (Design Year 2040).....	251
Table 8-18: Residual Flood Risks (Source: Flood Risk Assessment).....	254
Table 8-19: Recent applications granted permission in the vicinity of the Proposed Development	256
Table 9-1: Glossary of Acoustic Terminology.....	267
Table 9-2: Definition of Quality of Effects.....	270
Table 9-3: Definition of Significance of Effects.....	270
Table 9-4: Definition of Duration of Effects.....	271
Table 9-5: Quiet Area Screening of the Development Location.....	272
Table 9-6: Construction Noise Limits (Source: TII, 2004).....	274
Table 9-7: Recommended Vibration Criteria During Construction Phase.....	274
Table 9-8: Equipment associated with proposed construction activities.....	278
Table 9-9: Equipment associated with proposed demolition activities.....	278
Table 9-10: Recent applications in the vicinity of the Proposed Development.....	281
Table 10-1: Landscape/Townscape Value and Sensitivity.....	297
Table 10-2: Magnitude of Landscape/Townscape Impacts.....	298
Table 10-3: Impact Significance Matrix.....	298
Table 10-4: Magnitude of Visual Impacts.....	302
Table 11-1 Archaeological investigations carried out within close proximity to the subject site.	370
Table 11-2: Definitions of level of impact.....	387
Table 11-3 Site of Archaeological Potential 1 (AAP1) (Figure 11-10).....	390
Table 11-4 Site of Archaeological Potential 2 (AAP2) (Figure 11-10).....	391
Table 11-5 Area of Archaeological Potential 3 (AAP3) (Figure 11-10).....	392
Table 11-6 Describing the significance of effects (based on EPA, 2022).....	393
Table 12-1 Junction 1 - Sybil Hill Road (R808) / Howth Road (R105).	406
Table 12-2: Junction 2 - Sybil Hill Road (R808) / St. Pauls Access Road.....	407
Table 12-3: Junction 3 - Sybil Hill Road (R808) / Vernon Avenue.	407
Table 12-4: Junction 1 - Sybil Hill Road (R808) / Howth Road (R105).	408
Table 12-5 Junction 5 - Vernon Avenue (R808) / Clontarf Road (R807).	408
Table 12-6: Existing Bus Network.....	412
Table 12-7: Existing Modal Split Census 2016.....	417
Table 12-8: Schedule of Accommodation.....	418
Table 12-9 DCC Development Plan (2016 – 2022).....	419
Table 12-10: Design Standards for new Apartments – December 2020.....	420
Table 12-11: Proposed Bicycle Parking.....	420
Table 12-12: TRIC Rates – Proposed Development.....	421

Table 12-13: Trip generated – Proposed Development	422
Table 12-14: DCC Development Plan (2016 – 2022).....	423
Table 12-15: Draft Dublin City Development Plan 2022-2028 Parking Standards	424
Table 12-16 Car Parking Provided	425
Table 12-17: Junction 1	430
Table 12-18: Junction 2	430
Table 12-19: Junction 3	430
Table 12-20: Junction 4	430
Table 12-21: Junction 5	430
Table 12-22: Junction 2 – PICADY Analysis Results	434
Table 12-23: Junction 3 - TRANSYT Analysis Results	436
Table 12-24: Junction 6 - PICADY Analysis Results	437
Table 12-25: Terminology used to assess the quality potential impacts & effects	445
Table 12-26: Terminology used to assess the significance of potential impacts & effects	446
Table 12-27: Terminology used to assess the duration of potential impacts/effects	446
Table 12-28: Definition of the Extent and Context of Effects	447
Table 12-29: Definition of the Probability of Effects	447
Table 12-30: Historical Land Use	449
Table 12-31 Relatively large-scale developments permitted in the vicinity of the Proposed Development	462
Table 13-1 Classification of National Likelihood Criteria (Source: A National Risk Assessment for Ireland (2020) Department of Defence).....	472
Table 13-2: Major Accidents and/or Disasters Reviewed.....	474
Table 14-1: Interactions between Factors	485
Table 14-2 Population and Human Health	486
Table 14-3: Biodiversity	488
Table 14-4: Land and Soils	490
Table 14-5: Hydrology and Hydrogeology	492
Table 14-6: Air Quality and Climate.....	494
Table 14-7: Noise and Vibration	496
Table 14-8: Landscape and Visual	498
Table 14-9: Archaeology and Cultural Heritage	499
Table 14-10: Material Assets - Traffic, Waste and Utilities.....	500

LIST OF FIGURES

Figure 1-1: EIA Process	2
Figure 2-1: Total Site Area and Site Developable Area	15
Figure 2-2 Location of the Proposed Development.....	17

Figure 2-3 Proposed Site Layout of the Site Developable Area (Hawkins Brown Drawing no. FORA-HBA-SW-00-DR-A-00-0011).....	18
Figure 2-4 Permissible and Open for Consideration Uses for Z15 zoned lands (DCDP 2016-2022)	22
Figure 2-5: Site Layout Plan for planning Reg. Ref. 4185/15 (Reddy Architecture, 2015)	23
Figure 2-6 Landscape Masterplan for alternative design (ABP Ref. 302225-18) (BSM Landscape Architects, 2017)	24
Figure 2-7 Chosen Layout (Source: Landscape Design Statement, August 2022)	25
Figure 4-1: Local Electoral Area Boundary (Source Local Electoral Area Boundary Committee No. 2)	45
Figure 4-2: Health impact of the built environment.....	46
Figure 4-3 : Site Layout Map (Hawkins Brown, Drawing FORA-HBA-SW-XX-DR-A-00-0000)....	49
Figure 4-4: Proposed Development Layout (Ground Floor) (Hawkins Brown Drawing no. FORA-HBA-SW-00-DR-A-00-0011).....	50
Figure 4-5: Social Determinants of Health (Healthy Ireland, DOH 2013)	63
Figure 5-1 Image showing the locations of the surveyors during the emergence survey conducted on 26 th July 2022. Red circles indicate the focus point of each surveyor i.e., the south-western corner of the prefab and tree 38 to the north-west	86
Figure 5-2 Tree 38, the subject of the emergence survey. Visible holes observed at height (red circles) and close up image of main hole.	86
Figure 5-3: Site Location Map.....	94
Figure 5-4 European Sites within 15km of the Proposed Development	100
Figure 5-5 Designated Sites within 5km of the Proposed Development	101
Figure 5-6. Habitat Map	103
Figure 5-7 Results of September 2021 dusk activity survey.	112
Figure 5-8 Results of July 2022 dusk activity survey and PBR/ bat habitat survey.	114
Figure 5-9 Examples of PBR features observed at the prefab structure.	115
Figure 5-10 Left-right: Example of interior of prefab structure and PBR feature in the ceiling of the hallway.	115
Figure 5-11 Images of the western side of the prefab which was inaccessible on the day of survey.	116
Figure 5-12 Images of the damage to pre-fab structure's south-western corner. Left-right: The damage, potential claw marks (Yellow) & insect remains at the base of the hole (Red).	116
Figure 5-13. PBR feature at south-western corner of prefab was well lit by floodlighting during the emergence survey.....	117
Figure 5-14: Proposed Site Layout (Adapted from NMP Landscape Design Statement – August 2022)	129

Figure 5-15 Proposed building heights at the Site of the Proposed Development (Adapted from Foxlands, Design Statement, 2022)	138
Figure 5-16. Example of the proposed building façades (Block D) with opaque materials comprising coloured brick, stone panelling, and metalwork throughout (Adapted from Design Statement, Hawkins Brown, 2022).	139
Figure 5-17. Schematic representation of an artificial sett design with 7 chambers and 6 entrances. Three open tunnels would allow expansion of the sett following occupation. Extracted from Badger Assessment Report (Keeley, 2022).	145
Figure 5-18. Image showing the location of the proposed artificial sett area within the north-eastern corner of the Site (Orange area).	145
Figure 5-19. Internal Lighting Guidance Diagram adapted from ILP (2018).	148
Figure 6-1: Extract from GSI Bedrock Geology Map	166
Figure 6-2: Extract from GSI Groundwater Aquifer Map	167
Figure 6-3: Extract from GSI Groundwater Vulnerability Map	167
Figure 6-4: Site Investigation Locations	168
Figure 7-1 Site Location	182
Figure 7-2 Aquifer Classification (Source: GSI, 2022)	185
Figure 7-3 Groundwater Vulnerability (Source: GSI, 2022)	185
Figure 7-4 Groundwater Levels and Inferred Flow Direction (GIL, 2015)	186
Figure 7-5 Groundwater Sources	192
Figure 7-6 Groundwater and Surface Water bodies and WFD Status	194
Figure 7-7 European Sites within 15km of the Proposed Development Site	196
Figure 8-1: Ireland's Greenhouse Gas Emissions by Sector for 2020 (Source: EPA, 2021).....	227
Figure 8-2: Wind Speed Frequency Distribution at Dublin Airport Synoptic Weather Station over 5 years (2016-2020).....	234
Figure 8-3: 5-year Windrose at Dublin Airport Synoptic Weather Station 2016-2020 (Developed using Met Eireann Hourly Data).....	235
Figure 9-1: Scale and Indicative Noise Levels on the dB(A) Scale (Based on guidance taken from: Design Manual for Roads and Bridges, Volume 11 Consolidated Edition 1993).....	267
Figure 9-2: Study Area.....	269
Figure 9-3: Location of Noise Sensitive Locations in relation to Project Site.....	276
Figure 10-1: Study area for the Proposed Development.....	303
Figure 10-2: Site boundary overlaid onto Google Earth imagery (2018 capture)	304
Figure 10-3: A dark green paladin fence aligns the eastern and southern site boundaries, and part of the northern boundary.....	305
Figure 10-4: The site when viewed from its southern boundary.	306
Figure 10-5: To the immediate south of the site is the tree-lined, 19th Century main Avenue of St. Anne's Park.....	307

Figure 10-6: Extract of Ordnance Survey 1829-1842 map, showing the agricultural nature of the site..... 308

Figure 10-7: Extract of Ordnance Survey 1897-1913 map, showing site lands to be then a mix of agricultural lands (in its north half) and 'landscaped' parkland (in its southern half). 309

Figure 10-8: Playing pitches south of the Main Avenue and south of the site. Please note the density of tall, dense trees (aligning the Main Avenue) to the north (i.e., left) of this view. 310

Figure 10-9: Extract of Map B of the Dublin Development Plan, showing how the site is contained within Zone Z15..... 312

Figure 10-10: Landscape character and fabric within the site and St. Anne's Park. 318

Figure 11-1: Detail of development plan map B, with application site outlined in a broken red line. Source: Dublin City Development Plan map B, with site boundary overlaid..... 357

Figure 11-2 Down Survey Map of the Barony of Coolock 1656-58, location of Proposed Development circle in red 363

Figure 11-3 Extract of Rocque's 1760 Map of the County of Dublin, proposed site location outlined in red 364

Figure 11-4 Detail of Ordnance Survey map of 1843 with site boundary overlaid..... 365

Figure 11-5 Detail of Ordnance Survey map of 1907 with site boundary overlaid..... 367

Figure 11-6 Front of Maryville House, undated (J. Sharkey 2002) 368

Figure 11-7 Extract from Google Earth and 1st-edition OS mapping showing outline of some of the associated features of Maryville House (in orange) and the intersecting field boundaries (in blue) 372

Figure 11-8 Map of Geophysical survey results on the site of Maryville House (Shanarch 2015) 373

Figure 11-9: Summary of Land Acquisition 374

Figure 11-10 Gateway and railings at access from Sybil Hill Road 375

Figure 11-11 Site for proposed access, with St Paul's School to right and Sybil Hill House to left 375

Figure 11-12 Site of proposed access road, with Ha-Ha at left..... 376

Figure 11-13 St Paul's College 376

Figure 11-14 Sybil Hill House with southern elevation at right and western elevation at left 377

Figure 11-15 Northern elevation of Sybil Hill House 378

Figure 11-16 Eastern elevation of Sybil Hill House 378

Figure 11-17 Eastern side of Sybil Hill House, seen from application site..... 379

Figure 11-18 Prefabricated classrooms..... 379

Figure 11-19 Brick-faced wall near the northern boundary 380

Figure 11-20 Modern gateway to St Anne's Park..... 381

Figure 11-21 View eastward along avenue through St Anne's Park..... 382

Figure 11-22 View north along path adjacent to eastern perimeter of Proposed Development. 382

Figure 11-23 View northwards across Naniken River bridge to All Saints Road entrance to park	383
Figure 11-24 Western elevation of concrete-built bridge over the Naniken River	383
Figure 11-25 North facing elevation of Walled Garden wall, showing limestone foundation.....	384
Figure 11-26 Proposed Development lands, facing northwest	385
Figure 11-27 Overgrown northwestern corner of proposed development at townland boundary with Harmonstown	386
Figure 11-28 Proposed Development footprint showing locations of AAP1, AAP2 & AAP3 (Hawkins\Brown Architects)	393
Figure 12-1 Proposed Development Location	403
Figure 12-2 Local Road Network	404
Figure 12-3 Junctions Surveyed	405
Figure 12-4: Existing Cycle Network.....	409
Figure 12-5: New GDA Cycle Network	410
Figure 12-6: Location of the nearest Dart Station	411
Figure 12-7: Location of the nearest Bus Stops	413
Figure 12-8: Bleeper Bikes Map	414
Figure 12-9: Location of the nearest GoCar Station.....	415
Figure 12-10: SapMap Areas.....	416
Figure 12-11: Extract of Map J from the Dublin City Development Plan 2016 – 2022	423
Figure 12-12: Proposed Development – Trip Distribution	426
Figure 12-13: Trips generated – Proposed Development	427
Figure 12-14: Preliminary Haul Routes	429
Figure 12-15: Scenario – 2040	432
Figure 12-16: Junction 2 – Sybil Hill Road / St. Pauls Access Road	433
Figure 12-17: Junction 3 – Sybil Hill Road/Vernon Ave.	435
Figure 12-18: Junction 6 – Sybil Hill Road / Sybil House Access Road	437
Figure 12-19 Chart showing typical classifications of the significance of impacts (EPA, 2022, Guidelines on the Information to be Contained in Environmental Impact Assessment Reports).....	448
Figure 12-20 ESB Networks distribution capacity drawing for the Proposed Development (Source: M&E Utilities Report, IN2 Engineering Design Partnership, August 2022)	451
Figure 12-21 Gas Networks Ireland map for the Proposed Development (Source: M&E Utilities Report, IN2 Engineering Design Partnership, August 2022).energy analysis	452
Figure 13-1 Dublin Airport Public Safety Zones – the approximate location of the site of the Proposed Development is represented by a red dot.....	481
Figure 15-1. Schematic representation of an artificial sett design with 7 chambers and 6 entrances. Three open tunnels would allow expansion of the sett following occupation. Extracted from Badger Assessment Report (Keeley, 2022).....	507

Figure 15-2. Image showing the location of the proposed artificial sett area within the north-eastern corner of the Site (Orange area)..... 508
Figure 15-3. Internal Lighting Guidance Diagram adapted from ILP (2018)..... 511

LIST OF APPENDICES

Appendix A Drawings
Appendix B Social Infrastructure Report and Childcare Needs Assessment
Appendix C Amplitude Acoustics (Letter of Confirmation)
Appendix D Habitat Map
Appendix E Badger Assessment Report
Appendix F Amphibian Report
Appendix G Bat Activity Maps and Bat Survey Metadata
Appendix H Naniken Freshwater Survey Report
Appendix I Site Investigation Report
Appendix J Surface Water Sampling Laboratory Reports
Appendix K Computational Fluid Dynamics (CFD) Model
Appendix L Flood Risk Assessment
Appendix M GoCar Letter of Intent
Appendix N TRIC Rates
Appendix O Public Transport Assessment
Appendix P Mechanical and Electrical Utilities Report
Appendix Q: Verified Views Report

1 INTRODUCTION AND METHODOLOGY

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been commissioned by the Applicant, Raheny 3 Limited Partnership, in respect of a planning application for a mixed-use residential development on lands east of St. Pauls College, Sybil Hill Road, Raheny, Dublin 5.

The site is bound to the north, east and south by St Anne's Park and to the west by residential development at The Meadows, Sybil Hill House (a Protected Structure) and St Paul's College. Vehicular access to the site is from Sybil Hill Road.

The Proposed Development consists of the construction of a residential and nursing home development set out in 7 no. blocks, ranging in height from 4-7 storeys to accommodate 580 no. apartments, residential tenant amenity spaces, a crèche and a 100-bed nursing home. The site will accommodate car parking spaces, bicycle parking spaces, storage, services and plant areas at both basement and podium level.

Landscaping will include extensive communal amenity areas, and a significant public open space provision on the east and south of the site. The proposed application includes all site landscaping works, green roofs, substations, boundary treatments, lighting, servicing, signage, surface water attenuation facilities and associated and ancillary works, including site development works and services above and below ground. For a full description of the Proposed Development please refer to the Statutory Notices.

1.1.1 Quality Assurance and Competence

This Chapter was prepared by Louise Hewitt, Environmental Consultant, Enviroguide Consulting. Louise has a Master of Science (Hons) in Environmental Resource Management from University College Dublin and a Bachelor of Science (Hons) in Biology from Maynooth University. Louise has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Introduction Chapters, Population and Human Health Chapters and Archaeology and Cultural Heritage Chapters of EIARs.

1.2 Definition of EIA and EIAR

EIA is a systematic examination of the potential impacts of a Proposed Development on the environment. In assessing the environmental impacts, this EIAR will evaluate the existing situation and assess any potential impacts of the Proposed Development. Where potential impacts are identified proposed mitigation measures will be identified. In addition, the in-combination effects of any other known plans or projects will be identified and assessed.

Under Schedule 5 of the Planning and Development Regulations 2001, as amended (the Planning Regulations), an EIAR (formerly an EIS) is required to accompany certain planning applications for specified projects as part of the EIA process.

The EIAR describes the outcomes of the iterative EIA process which was progressed in parallel with the project design process. In doing so, it forms the first part of the EIA process that will be completed by Dublin City Council, as the competent authority, which in turn will be

required to examine, analyse, and evaluate the direct and indirect effects of the development on the various factors listed in Directive 2011/92/EU, as amended by 2014/52/EU (the EIA Directive).

"The EIAR should be prepared at a stage in the design process where changes can still be made to avoid adverse effects. This often results in the modification of the project to avoid or reduce effects through redesign" (EPA, 2022)

Where significant and likely environmental effects are identified that are unacceptable, the EIA process aims to quantify and minimise the effects of the impact that the specified development has on the environment through appropriate mitigation measures and where necessary, subsequent monitoring.

This process is illustrated in Figure 1-1.

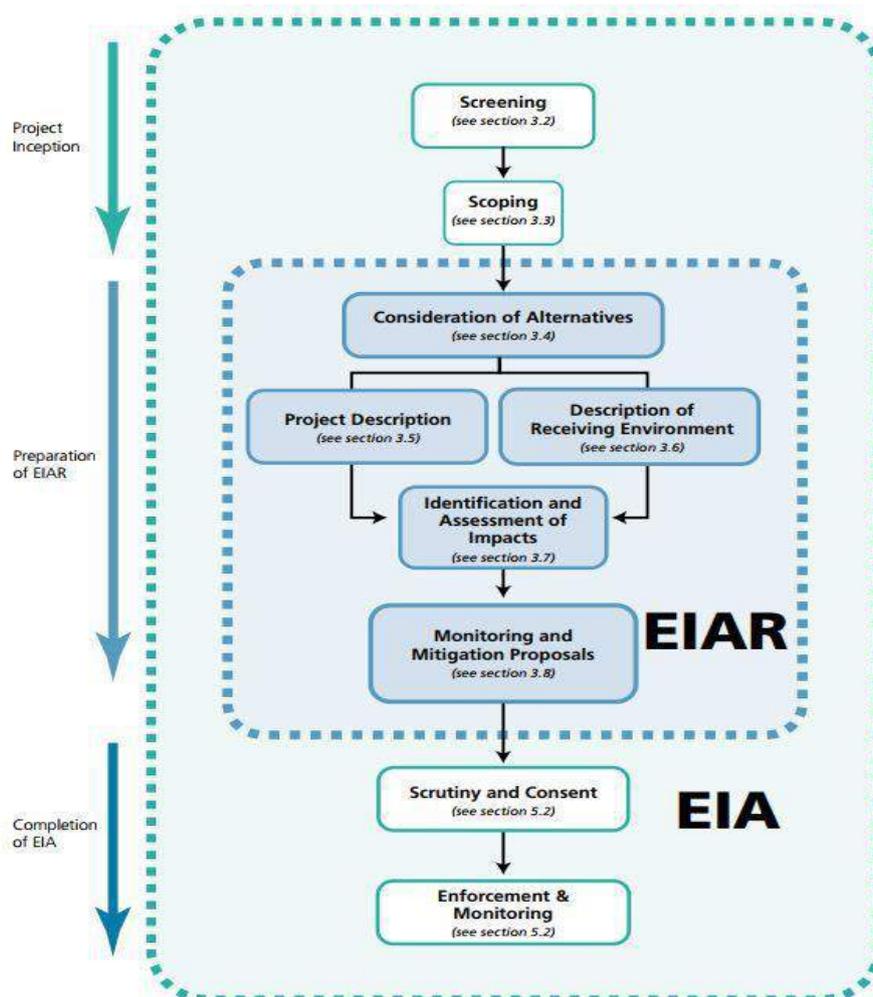


Figure 1-1: EIA Process

The purpose of the EIAR is to provide the Planning Authority with information on the likely and significant effects on the environment by the Proposed Development. This EIAR was prepared in parallel with the project design process and reflects the potential cumulative impact of other developments.

1.3 EIA Legislation

The EIA Directive requires EIA to be carried out for certain projects as listed in Annex I of the Directive. The EIA Directive is transposed into Irish law through the Planning and Development Act 2000 (as amended) (the Planning Act) and the Planning Regulations.

1.4 EIA Guidelines

This EIAR has been prepared in accordance with all relevant guidance. The documents listed below are common to all chapters. Additional specific guidelines will be referred to in each specific chapter.

- Guidelines on the Information to be contained in Environmental Impact Statements (EPA 2002);
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA 2003);
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA draft September 2015a);
- Draft Revised Guidelines on the Information to be Contained in Environmental Impact Statements (EPA draft September 2015b);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA May 2022);
- Environmental Assessments of Plans, Programmes and Projects – Rulings of the Court of Justice of the European Union (European Union 2017);
- Environmental Impact Assessment of Projects – Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU) (European Union 2017);
- Guidance of Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Union 2013);
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Union 2017);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Environment, Community and Local Government 2013);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Government of Ireland 2018);
- Key Issues Consultation Paper on the Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems; (Department of Housing, Planning, Community and Local Government 2017);

- Circular PL 05/2018 -Transposition into Planning Law of Directive 2014/52/EU amending Directive 2011/92/EU on the effects of certain public and private projects on the environment (the EIA Directive) And Revised Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government 2018);
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Communities 1999); and
- Implementation of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (European Communities 2003).
- Appropriate Assessment Screening for Development Management; OPR Practice Note PN01(Office of the Planning Regulator March 2021)
- Office of the Planning Regulator (OPR) Environmental Impact Assessment Screening Practice Note (2021).

The EIA Directive defines EIA as a process. Article 1(2)(g) states that EIA means:

“(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”.

The EIA Directive requires the EIAR to identify, describe and assess, in an appropriate manner and in light of each individual case, the direct, indirect, and cumulative significant effects of the Proposed Development on factors of the environment including:

- a) Population and human health
- b) Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC (respectively, the Habitats Directive and the Birds Directive)
- c) Land, soil, water, air, and climate

d) Material assets, cultural heritage, and the landscape

The interaction between the factors referred to in points (a) to (d)

1.5 Screening for EIA

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

Annex 1 of the EIA Directive requires as mandatory an EIA for all development projects listed therein.

Schedule 5, Part 1, of the Planning Regulations transposes Annex 1 of the EIA Directive directly into Irish planning legislation. An EIAR is required to accompany a planning application for development of a class set out in Schedule 5, Part 1 of the Planning Regulations which exceeds a limit, quantity or threshold set for that class of development.

Schedule 5, Part 2 of the Planning Regulations defines projects that are assessed on the basis of set mandatory thresholds for each of the project classes including:

Schedule 5, Part 2 - Infrastructure projects

"10. Infrastructure projects

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

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

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 Proposed Development provides for 580 no. residential units, which is over the 500 dwelling unit threshold and subsequently a mandatory EIAR is required.

1.6 Scope of the EIAR

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

'Determining the content and of the matters which should be covered in the environmental information to be submitted in the EIAR'

The content of this EIAR was informed by a scoping process carried out by the Applicant, design team and EIAR consultants to identify the core issues likely to be most important during the EIA process.

The EIAR prepared for the Proposed Development has endeavoured to be as thorough as possible and therefore all of the issues listed in Schedule 6, Sections 1 and 2 of the Planning Regulations have been addressed in the EIAR.

The scope of this EIAR has had regard to the documents listed in Section 1.4 above, together with:

- The requirements of Part X of the Planning Act and also Part 10 of the Planning Regulations;
- The requirements of the Dublin City Development Plan 2016-2022;
- The requirements of the Draft Dublin City Development Plan 2022-2028;
- Relevant Regional and National Planning Policy Documents;
- The receiving environment and any vulnerable or sensitive local features and current uses;
- Previous relevant planning history and applications that have been submitted on the subject and adjoining lands;
- The likely and significant impacts of the Proposed Development on the environment; and
- Available mitigation measures for reducing or eliminating any potentially significant undesirable impacts.

In addition, the individual chapters of this EIAR should be referred to for further information on the documents consulted by each individual consultant.

1.7 Purpose and Objectives of the EIAR

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

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

- Anticipating, avoiding, and reducing significant effects;
- Assessing and pursuing preventative action;
- Maintaining objectivity;
- Ensuring clarity and quality;
- Providing relevant information to decision makers; and
- Facilitating public and stakeholder consultation.

EIA is an iterative process. The EIAR captures this assessment process and describes its outcomes. The EIAR documents the consideration of environmental effects and provides

transparent, objective and replicable documentary evidence of the EIA evaluation and decision-making processes.

The EIAR provides information on any identified effects arising as a consequence of the Proposed Development and which:

- Are environmentally based;
- Are likely to occur; and
- Have significant and adverse effects on the environment.

It also documents how the Proposed Development design incorporates measures for the purposes of impact avoidance, reduction or amelioration, as well as to explain how significant adverse effects will be avoided.

The key objective of this EIAR is to inform the Planning Authority on the acceptability of the Proposed Development, in carrying out an EIA, in order to reach a decision in the full knowledge of the Proposed Development's likely significant impacts on the environment, if any.

1.8 Format and Structure of this EIAR

The formation of an EIAR necessitates the co-ordination and collation of associated, yet diverse specialised areas of assessment. The EIA approach involves the examination of each environmental factor, describing the existing baseline environment, the Proposed Development, its likely impacts, and direct and indirect significant effects pertaining to that environmental factor and mitigation measures, where appropriate.

The topics examined in this EIAR are categorised under the environmental factors prescribed under the EIA Directive:

- Population and Human Health
- Biodiversity
- Land & Soils
- Water
- Air
- Climate
- Material Assets
- Cultural Heritage
- Landscape

The expected effects deriving from the vulnerability of the Proposed Development to risks of major accidents and/or disasters must also be examined.

The structure of the EIAR is set out in Table 1-1.

Table 1-1: Structure of the EIAR

Chapter	Title	Content
1	Introduction and Methodology	Chapter 1 sets out the purpose, methodology and scope of the document.
2	Description of the Proposed Development & Assessment of Alternatives	As required under Article 5(1)(a) of the EIA Directive 2014/52/EU (subsequently referred to as the Directive), Chapter 2 provides a description of the site, design and scale of the Proposed Development, and as required under Article 5(d), an evaluation of the reasonable alternative design approaches.
3	Planning and Policy Context	Chapter 3 sets the national, regional and local policy framework for the Proposed Development.
4	Population and Human Health	Chapter 4 covers the requirement for assessment on potentially significant effects to population and human health as required under Article 3(1)(a) of the Directive.
5	Biodiversity	Chapter 5 covers the requirement of Article 3(1)(b) of the Directive to assess potentially significant effects on biodiversity (which previously referred only to 'fauna and flora'), having particular attention to species and habitats protected under the Habitats Directive and the Birds Directive.
6	Land and Soils	Chapter 6 covers the requirement under Article 3(1)(c) of the Directive on Land and Soil to assess the type of soil and geology in the area of the Proposed Development and identifies any potentially significant effects.
7	Hydrology and Hydrogeology	Chapter 7 covers the requirement under Article 3(1)(c) of the Directive to assess potentially significant effects to water quality arising from the Proposed Development. This Chapter will assess any potential effects from pollution and discharges to surface water.
8	Air Quality and Climate	Chapter 8 covers the requirement under Article 3(1)(c) of the Directive on Air and Climate to assess potentially significant effects to air quality in the surrounding environment.
9	Noise and Vibration	Chapter 9 covers the requirement to assess potentially significant effects from airborne noise and vibration as required under Article 3(1)(a) of the Directive on Human Health.
10	Landscape and Visual Amenity	Chapter 10 covers the requirement under Article 3(1)(d) of the Directive to assess potentially significant effects on the landscape. This Chapter will assess any potential visual impacts to landscape caused by the Proposed Development.
11	Archaeology and Cultural Heritage.	Chapter 11 covers the requirement under Article 3(1)(d) of the Directive to assess potentially significant effects on cultural heritage.
12	Material Assets _Traffic, Utilities and Waste Management	Chapter 12 covers the requirement under Article 3(1)(d) of the Directive to assess potentially significant effects on material assets. This Chapter will identify impacts to existing utilities and

Chapter	Title	Content
		<p>infrastructure from the development of the Proposed Development.</p> <p>Article 5(1), Annex IV, point 1(d) of the Directive requires estimates of quantities and types of waste produced during construction and operation phase. Chapter 12 will also present an assessment of how resources and waste will be managed for the Proposed Development.</p>
13	Risk Management	Chapter 13 covers the requirement under Article 3(2) of the Directive to include the expected effects deriving from the vulnerability of the Proposed Development to risks of major accidents and/or disasters.
14	Interactions	As required under Article 3(1)(e) of the Directive, Chapter 14 provides an assessment of the interaction between all of the environmental aspects referred to in this EIAR.
15	Mitigation and Monitoring	Chapter 15 describes mitigation and monitoring as required under Article 5(1) of the Directive in order to avoid, prevent, reduce, or if possible, offset any identified significant adverse effects on the environment and, where appropriate, describes any proposed monitoring arrangements.

This approach employs standard descriptive methods, replicable prediction techniques and standardised impact descriptions to provide an appropriate evaluation of each environmental topic under consideration.

1.9 Methodology Used to Produce this EIAR

The methodology employed to produce this EIAR is detailed in Table 1-2. The objective is to evaluate each environmental topic, both individually and collectively, in a systematic and objective manner.

The methodology will outline the methods used to describe the baseline environmental conditions as well as predict the likely impacts on the environment of the Proposed Development. The data and survey requirements for each chapter will vary depending on the environmental topic and will be chosen by the particular specialist based on relevant legislation, best practice guidance, policy requirements, and professional judgement. Similarly, the study area is also defined for each environmental topic based on professional judgement and experience.

All environmental topics require desktop reviews of all relevant data at a minimum. These desktop studies are then supplemented by field studies and consultations with relevant stakeholders, for example interested parties, statutory bodies, and local authorities, as required for each environmental topic.

An outline of the methodology employed consistently in each chapter of the EIAR to examine each environmental topic is provided in Table 1-2:

Table 1-2: Methodology Employed to Produce each EIAR Chapter.

Introduction	Provides an overview of the specialist area and specifies the specialist who prepared the assessment.
Study Methodology	This subsection outlines the method by which the relevant impact assessment has been conducted within that chapter.
The Existing Receiving Environment (Baseline Situation)	This section will describe and assess the receiving environment, the context, character, significance, and sensitivity of the baseline receiving environment into which the Proposed Development will fit. This analysis also takes account of any other proposed developments that are likely to proceed in the immediate surroundings.
Characteristics of the Proposed Development	<p>Consideration of the '<i>Characteristics of the Proposed Development</i>' allows for a projection of the '<i>level of impact</i>' on any particular aspect of the environment that could arise.</p> <p>For each chapter, those characteristics of the Proposed Development which are relevant to the area of study are described; for example, the chapter on landscape and visual impact addresses issues such as height, design and impact on the surrounding landscape.</p>
Potential Impact of the Proposed Development	<p>This section provides a description of the specific, direct, and indirect, effects that the Proposed Development may have. This analysis is provided with reference to both the Existing Receiving Environment and Characteristics of the Proposed Development sections, while also referring to the: (i) magnitude and intensity, (ii) integrity, (iii) duration and (iv) probability of impacts.</p> <p>The assessment addresses whether the impacts are direct, indirect, secondary, or cumulative in nature. It also looks at the timescale of such impacts e.g. are they short, medium, long-term, and are they of a temporary, permanent, continuous or intermittent nature, and are they positive or negative impacts. The impact interactions are also addressed.</p>
Do Nothing Impact	In order to provide a qualitative and equitable assessment of the Proposed Development, this section considers the Proposed Development in the context of the likely impacts upon the receiving environment should the Proposed Development not take place.
Avoidance, Remedial and Mitigation Measures	<p>This section of each chapter describes the mitigation measures which are required. The requirement to describe mitigation measures is laid out in the EIA Directive, as implemented by the Planning Act and the Planning Regulations.</p> <p>Avoidance, remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential impacts of the Proposed Development. This includes avoidance, reduction and remedy measures as set out in Section 4.7 of the Development Management Guidelines 2007, to reduce or eliminate any significant adverse impacts identified.</p>
Residual Impacts of the Proposed Development	This section allows for a qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term, temporary, permanent, continuous, or intermittent, positive and negative effects as well as impact interactions which the Proposed Development may have, assuming all mitigation measures are fully and successfully applied.
Monitoring	This involves a description of monitoring in a post-development phase, if required. This section addresses the effects that require monitoring, along with the methods and the agencies that are responsible for such monitoring.

Reinstatement	While not applicable to every aspect of the environment considered within the EIAR, certain measures may need to be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact to the environment.
Interactions	This section provides a description of impact interactions together with potential indirect, secondary, and cumulative impacts.
Difficulties Encountered in Compiling Information	The EIA Directive requires that the EIAR includes ' <i>details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information, and the main uncertainties involved</i> ' (EIA Directive, Annex IV, Part 6). Each chapter that contains an environmental baseline and assessment contains a section outlining any difficulties encountered in compiling that chapter.

1.10 EIAR Project Team

Table 1-3: EIAR Project Team

Chapter	Consultant Name and address	Specialist Area
1.0 Introduction and Methodology including Non-Technical Summary	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Janet O'Shea / Louise Hewitt	Multidisciplinary Planning and Environmental Consultants
2.0 Project Description and Alternatives Examined	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Nikita Coulter	Multidisciplinary Planning and Environmental Consultants
3.0 Planning & Policy Context	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Mairead Foran Brady Shipman Martin, Mountpleasant Business Centre, Ranelagh, Dublin D06 X7P8 Sorcha Turnbull	Multidisciplinary Planning and Environmental Consultants Planning and Development Consultants
4.0 Population and Human Health	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Janet O'Shea / Louise Hewitt	Multidisciplinary Planning and Environmental Consultants

5.0 Biodiversity	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Liam Gaffney	Multidisciplinary Planning and Environmental Consultants
6.0 Land and Soils	Waterman Moylan, EastPoint Business Park, Alfie Byrne Rd, East Wall, Dublin 3, D03 H3F4 Stephen Dent Neville	Engineering and Environmental Consultants
7.0 Hydrology & Water	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Candice Serbu	Multidisciplinary Planning and Environmental Consultants
8.0 Air Quality & Climate	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Aoife Grogan / Laura Griffin	Multidisciplinary Planning and Environmental Consultants
9.0 Noise and Vibration	Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Laura Griffin	Multidisciplinary Planning and Environmental Consultants
10.0 Landscape & Visual Amenity	Macro Works Ltd, Cherrywood Business Park, Bray Rd, Cherrywood, Loughlinstown, Co. Dublin. Jamie Ball	Landscape and Visual (LVIA) Consultants
11.0 Archaeology, Architectural, and Cultural Heritage	Archaeology and Built Heritage Ltd, Spade Enterprise Centre, St. Paul's Smithfield, North King Street, Dublin 7. James Kyle IAC, Unit G1, Network Enterprise Park, Kilcoole, Co. Wicklow Rob Goodbody	Archaeological Consultants Architectural Consultant
12.0 Material Assets: Traffic, Waste, and Utilities	<u>Waste & Utilities</u> Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN Nikita Coulter	Multidisciplinary Planning and Environmental Consultants

	<p><u>Traffic</u></p> <p>Waterman Moylan, EastPoint Business Park, Alfie Byrne Rd, East Wall, Dublin 3, D03 H3F4</p> <p>Stephen Dent Neville</p>	<p>Engineering and Environmental Consultants .</p>
<p>13.0 Risk Management</p>	<p>Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN</p> <p>Nikita Coulter</p>	<p>Multidisciplinary Planning and Environmental Consultants</p>
<p>14.0 Interactions</p>	<p>Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN</p> <p>Louise Hewitt</p>	<p>Multidisciplinary Planning and Environmental Consultants</p>
<p>15.0 Mitigation and Monitoring Measures</p>	<p>Enviroguide Consulting, 3D Core C, The Plaza, Park West, D12F9TN</p> <p>Louise Hewitt</p>	<p>Multidisciplinary Planning and Environmental Consultants</p>

1.11 Non-Technical Summary

A Non-Technical Summary of the EIAR has also been prepared. The EIA Directive states that one of the objectives of the EIA process is to ensure that the public is fully aware of the environmental implications of any decisions. EPA Guidelines note that the non-technical summary of the EIAR should facilitate the dissemination of the information contained in the EIAR and that the core objective is to ensure that the public is made as fully aware as possible of the likely environmental impacts of projects prior to a decision being made by the planning authority. A Non-Technical Summary of the EIAR has therefore been prepared which summarises the key environmental impacts and is provided as a separately bound document.

1.12 Links between EIAR and Appropriate Assessment

A Screening Report for Appropriate Assessment (AA) has been carried out for the Proposed Development to determine if there is a risk of effects to any Natura 2000 site. The AA Screening Report was unable to exclude the possibility that the Proposed Development will have a likely significant effect on the following European Sites; North Dublin Bay SAC (000206), North Bull Island SPA (004006), South Dublin Bay and River Tolka Estuary SPA (004024), Baldoyle Bay SPA (004016), Malahide Estuary SPA (004025) and Rogerstown Estuary SPA (004015). Accordingly, a Natura Impact Statement has been prepared for the Proposed Development. Where potentially significant effects were identified, a range of mitigation and avoidance measures have been suggested to help avoid them. This NIS has concluded that, ensuring the avoidance and mitigation measures are implemented as proposed, the Proposed Development will not have an adverse effect on the integrity of the above European sites, individually or in combination with other plans and projects.

While AA is required by the proposer of any plan or project likely to have an adverse effect on a Natura 2000 site, EIA is required for projects listed in Annex I of the EIA Directive. The requirement for EIA relative to projects listed in Annex II of the EIA Directive is determined on a case-by-case basis. While these two different types of assessment are independent and are required by separate legislation, namely the Birds and Habitat Directives (i.e. AA) and the EIA Directive (i.e. EIAR) there is a degree of overlap, particularly in the biodiversity chapter of the EIAR.

1.13 Availability of EIAR Documents

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

1.14 Statement of Difficulties Encountered

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

1.15 Quotations

The application is also accompanied by a Non-Technical Summary of the EIAR, which is laid out in a similar, but condensed format to the main EIAR. The structure, presentation, and the Non-Technical Summary of the EIAR, as well as the arrangements for public access, all facilitate the dissemination of the information contained in the EIAR. The core objective is to ensure that the public and local community are aware of the likely environmental impacts of the Proposed Development prior to the granting of consent.

However, it is important to acknowledge that the EIAR by its nature contains statements about the Proposed Development, some of which are positive and some less than positive. Selective quotation or quotations out of context can give a very misleading impression of the findings of the study. Therefore, the study team urges that quotations should, where reasonably possible, be taken from the conclusions of specialists' sections or from the Non-Technical Summary and not selectively.

The EIA Regulations require that difficulties such as technical deficiencies, lack of information or knowledge encountered in compiling any specified information for the EIAR be described. There were no such difficulties encountered in the production of this EIAR.

2 PROJECT DESCRIPTION & DESCRIPTION OF ALTERNATIVES

2.1 Introduction and Terms of Reference

This Chapter provides a detailed description of the Proposed Development together with details of the existing environment. In accordance with Article 5(1)(a) of the EIA Directive, the description of the project should comprise:

'Information on the site, design, size and other relevant features of the project'.

A description of the Proposed Development and its surroundings is provided in this Chapter, together with the proposed design parameters. This description sets out the basis against which the specialist assessments presented in this EIAR have been undertaken.

The EIAR must contain information in relation to the environmental impact of both the Proposed Development and all other "reasonable" alternatives studied. An indication of the main reasons for the option chosen must be given, taking into account the effects of the Proposed Development on the environment.

This Chapter was prepared by Senior Environmental Consultant Nikita Coulter of Enviroguide Consulting. Nikita Coulter has a B.Sc. in Zoology (Hons) from University College Dublin, an M.Sc in Biodiversity and Conservation, a Postgraduate Diploma in Environmental Engineering from Trinity College Dublin, and a NEBOSH accredited International Diploma in Environmental Risk Management. Nikita has 8 years professional experience as an Environmental Compliance Specialist.

2.2 Site Location and Description

Raheny 3 Limited Partnership are applying for permission for development on lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5. The site is bound to the north, east and south by St Anne's Park and to the west by residential development at The Meadows, Sybil Hill House (a Protected Structure) and St Paul's College. Vehicular access to the site is from Sybil Hill Road.

The total site area is 6.7 hectares with a site developable area of 6.18 hectares. The site is currently a greenfield site (Figure 2-1).



Figure 2-1: Total Site Area and Site Developable Area

2.3 Site History / Background

St Anne's Park is an extensive, historic parkland and a major amenity and public open space. The c. 97 ha Park is a well-used, popular amenity and recreational resource extending from its entrance off Sybil Hill Road in the west to the coast at Dollymount in the East.

St Paul's College was established in 1950 and forms part of a belt of religious lands located on both sides of Sybil Hill Road. The planned capacity of the school is 600 no. pupils with the ability to accommodate up to 650 no. pupils without significant additional accommodation.

The majority of the site of the Proposed Development, together with the adjoining St Paul's College and the Vincentian Order in Sybil Hill House, is zoned objective Z15 in the Development Plan "*To protect and provide for institutional and community uses*". Under the zoning objective, the proposed residential use is open for consideration. A small section of the site is zoned Z9 as this includes lands within St. Anne's Park required to provide for the routing of a surface water discharge from the site via St. Anne's Park to the Naniken River. No residential development is proposed on the lands contained within the application boundary which are zoned Z9.

2.4 Project Overview

The Proposed Development consists of the construction of a residential and nursing home development set out in 7 no. blocks, ranging in height from 4-7 storeys to accommodate 580 no. apartments, residential tenant amenity spaces, a crèche and a 100-bed nursing home. The site will accommodate car parking spaces, bicycle parking spaces, storage, services and plant areas at both basement and podium level.

Landscaping will include extensive communal amenity areas, and a significant public open space provision on the east and south of the site. The proposed application includes all site landscaping works, green roofs, substations, boundary treatments, lighting, servicing, signage, surface water attenuation facilities and associated and ancillary works, including site development works and services above and below ground. For a full description of the Proposed Development please refer to the Statutory Notices.

Figure 2-2 and Figure 2-3 detail the Site Location and the Proposed Site Layout Plan, respectively.

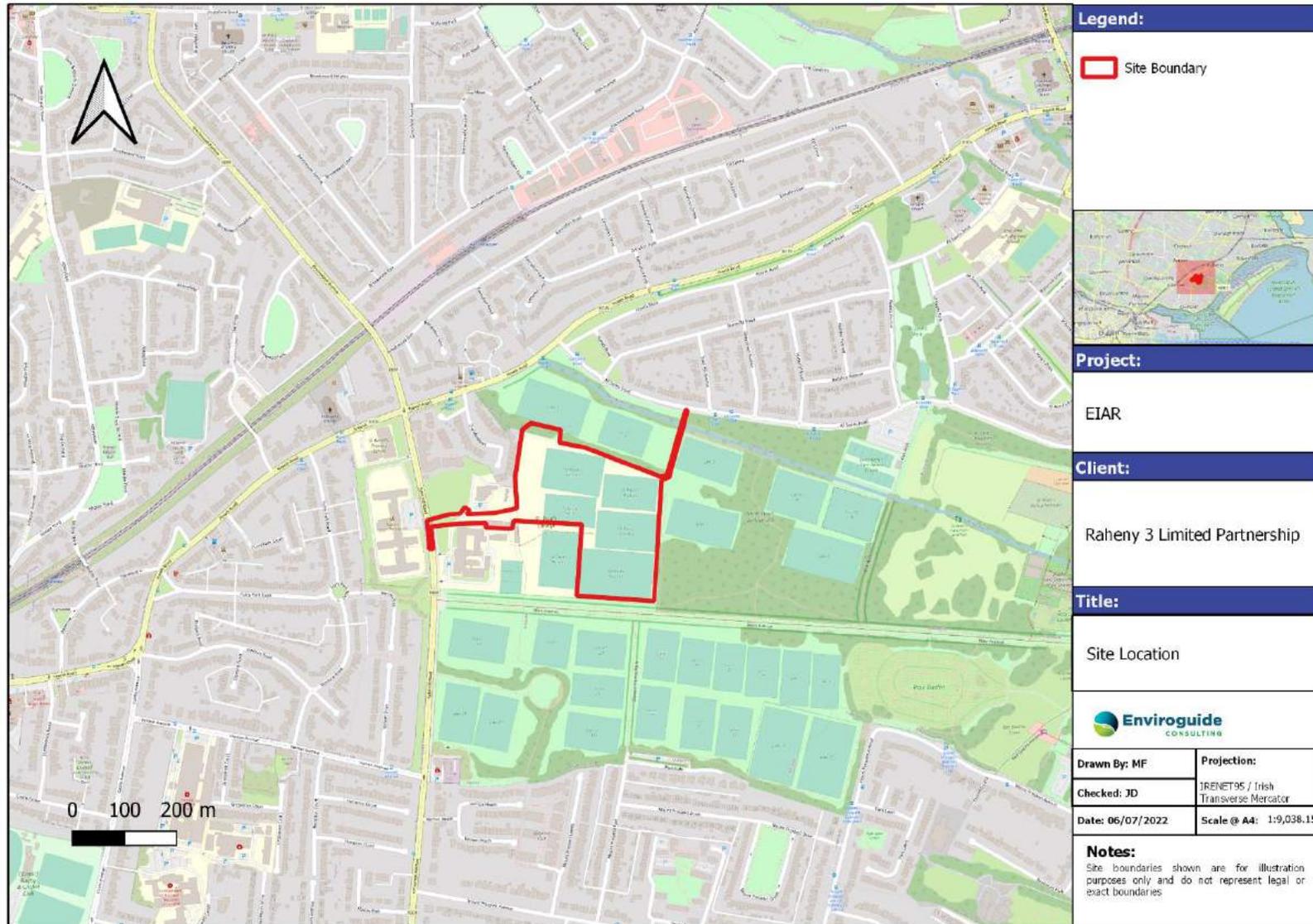


Figure 2-2 Location of the Proposed Development

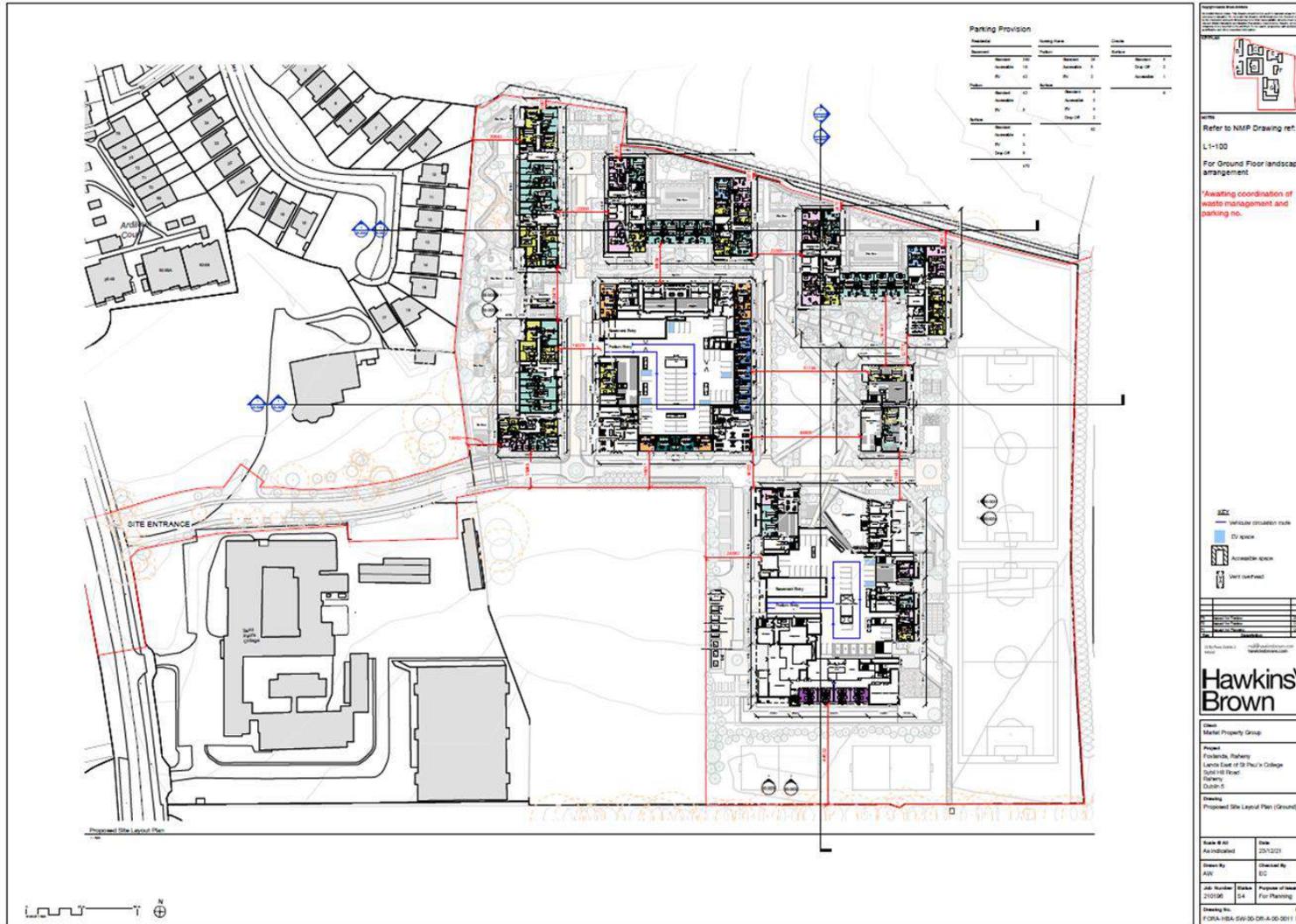


Figure 2-3 Proposed Site Layout of the Site Developable Area (Hawkins Brown Drawing no. FORA-HBA-SW-00-DR-A-00-0011)

2.5 Construction Phase

The Proposed Development is to be constructed in two stages which will include, in broad terms, the following:

- Stage I: Site demolition works, site clearance and preparation work for the construction. A site compound including offices and welfare facilities will be set up by the Main Contractor.
- Stage II: Site development and construction. The development includes all associated site works and infrastructure which includes roads, utilities, foul and surface water drainage.

The Construction Phase is intended to be an 18-month programme. The operational hours for the site will be 08:00 to 17:00 Mondays to Fridays and 08:00 to 14:00 Saturdays. No work is permitted on Sundays or public holidays. Deviation from these hours will only be allowed in exceptional circumstance with prior written approval from the planning authority.

2.6 Statutory Planning Context

The site of the Proposed Development is subject to National, Regional and Local level planning policy. The following outlines the key planning policy documents of relevance to the Proposed Development.

2.6.1 National

- Project Ireland 2040: National Planning Framework
- Sustainable Urban Housing: Design Standards for New Apartments 2020
- Urban Development and Building Heights – Guidelines for Planning Authorities 2018
- Housing for All – A New Housing Plan for Ireland (2021)
- Design Manual for Urban Roads & Streets 2013
- Climate Action and Low Carbon Development Act 2015 (as amended, 2021)
- Planning System and Flood Risk Management Guidelines 2009
- Sustainable Residential Development in Urban Areas Guidelines 2009
- Urban Design Manual, A Best Practice Guide 2009
- Smarter Travel, A Sustainable Transport Future. A New Transport Policy for Ireland 2009-2020
- National Investment Framework for Transport in Ireland (NIFTI) (2021)
- Transport Strategy for the Greater Dublin Area 2016 – 2035

2.6.2 Regional

- Eastern & Midland Regional Assembly Regional Spatial & Economic Strategy 2019-2031

2.6.3 Local

- Dublin City Council Development Plan 2016-2022

The policies and objectives contained in the various plans / policies that are relevant to the Proposed Development are addressed in detail in Chapter 3 (Planning and Policy Context) of this EIAR.

2.7 Description of Alternatives

2.7.1 Introduction

Consideration of reasonable alternatives is an important aspect of the EIA process and is necessary to evaluate the likely environmental consequences of a range of development strategies for the site of the Proposed Development within the constraints imposed by environmental and planning conditions. This section provides a description of the reasonable alternatives that have been considered.

Article 5 of the EIA Directive requires that that the EIAR contain:

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

This section of the EIAR provides an explanation of the reasonable alternatives examined throughout the design and consultation process. This serves to indicate the main reasons for choosing the Proposed Development, taking into account and providing a comparison of the environmental effects. The alternatives may be described at four levels:

- Alternative locations
- Alternative designs
- Alternative layouts
- Alternative processes

Pursuant to Section 3.4.1 of the Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022), the consideration of alternatives also needs to be cognisant of the fact that *“in some instances some of the alternatives described below will not be applicable - e.g. there may be no relevant ‘alternative location’...”*

In accordance with EPA Guidelines (EPA, 2022), different types of alternatives may be considered at several key phases during the process. As environmental issues emerge during the preparation of the EIAR, alternative designs may need to be considered early on in the process or alternative mitigation options may need to be considered towards the end of the process.

The EPA Guidelines (EPA, 2022) states:

“The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with ‘an indication of the main reasons for selecting the chosen option’. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or ‘mini-EIA’) of each alternative is not required.”

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

2.7.2 Alternative Locations

The Proposed Development is for the construction of a residential development including a childcare facility and a nursing home. The location on which the development is proposed is zoned Z15 in the Dublin City Development Plan 2016 – 2022, which includes childcare facilities as 'Permissible Uses' and residential development as 'Open for Consideration' within the DCDP 2016-2022. A small section of the site is zoned Z9 as this includes lands within St. Anne's Park required to provide for the routing of a surface water discharge from the site via St. Anne's Park to the Naniken River.

Within the Dublin City Development Plan, Z15 lands are identified as lands that have a contribution to make in respect of:

- The Vision for Dublin
- The Core Strategy consistency with National and Regional strategic guidance
- The development plan policies underpin the creation of a compact city with mixed-use environments, sustainable neighbourhoods and green infrastructure, to reduce the city's reliance of fossil fuels and provide for carbon soakage, all in accordance with the National Climate Change Strategy
- Support for an effective Public Transport system
- The Housing Strategy, which identifies Z15 lands as lands incorporating strategic residential use potential

The Housing Strategy identifies a need for 4,217 new housing units per annum in the city during the development plan period, and this demand will be ongoing. The Housing Strategy analysis shows that, other than the Inner City, the city population in the suburbs is falling.

The Dublin City Development Plan 2016 – 2022 and all of its constituent elements have been subject to Strategic Environmental Assessment and Appropriate Assessment, as required, during the plan preparation period. Therefore, as the potential of the lands has been identified in a superior plan, no alternative location for the residential development requires to be considered.

2.7.3 Alternative Uses

The subject lands are zoned Z15, which includes childcare facilities as 'Permissible Uses' and residential development as 'Open for Consideration' within the DCDP 2016-2022. The site of the Proposed Development is located in close proximity to the village cores of both Raheny and Clontarf, which host a range of social infrastructure, in addition to the high-quality public transport provided by both DART and city bus routes. In light of these nearby uses, the Site's zoning, and current demand for high quality residential units, other land uses on site would not be considered appropriate alternatives or would not be in accordance with the planning policy context pertaining to the lands. The Permissible and Open for Consideration Uses for Z15 zoned lands are listed in Figure 2-4 (DCDP 2016-2022).

Zoning Objective Z15
Permissible Uses Buildings for the health, safety and welfare of the public; childcare facility, community facility, cultural/recreational building and uses, education, medical and related consultants, open space, place of public worship, public service installation, residential institution.
Open for Consideration Uses Bed and breakfast, car park ancillary to main use, conference centre, funeral home, guest house, hostel, hotel, municipal golf course, residential, student accommodation, training centre.

Figure 2-4 Permissible and Open for Consideration Uses for Z15 zoned lands (DCDP 2016-2022)

Due to the nature of the current proposal, i.e., the development of residential dwellings and supporting community facilities including a childcare facility and a nursing home, it was not considered necessary to consider alternative uses for the Proposed Development.

2.7.4 Alternative Design & Layouts

The proposals for the subject lands were the subject of detailed discussions with all of the relevant authorities prior to the finalised scheme being prepared, which highlighted the environmental issues to be addressed to inform the design process. These considerations have informed the consideration of alternative layouts and designs, open space provision, addressing the issues of population and human health in a city environment, biodiversity, archaeology, road and access arrangements up to the formalisation of the final scheme which is submitted to Dublin City Council (DCC) for approval.

During the design process for the Proposed Development several iterations of the site layout and alternative designs were considered. The proposed residential development has been prepared in accordance with the requirements of the Dublin City Development Plan 2016-2022 and has been the subject of a number of pre-application meetings with the Planning Authority prior to lodgement. The proposal has also been the subject of a pre-application Large-scale Residential Development (LRD) consultation with DCC, with design alterations arising out of this process also. The key considerations and amendments to the design of the scheme, having regard to and comparing the key environmental issues, are set out and discussed below, including: -

- Design options and changes which were incorporated into the scheme as the proposals progressed through pre-application discussions with the Planning Authority;
- Key design changes arising following the lodgement of the LRD pre-application to DCC;
- Specific section on the alternative bridge design options that were considered in respect of the outfall to the Naniken river as required by the Sanitary Authority and

which resulted in the proposed design option, which provides an acceptable approach in respect to ecology, archaeology and flood risk impacts within St Anne's Park;

- Overview of the scheme submitted for approval.

2.7.4.1 Alternative 1: Withdrawn Application (DCC Ref. 4185/15)

An alternative design approach was used in a previous, withdrawn planning application (DCC Ref. 4185/15). The application is illustrated in Figure 2-5 and included sports facilities along with a large residential development and community facilities. In assessing that application, DCC indicated a preference that DCC would strongly favour a situation where it was evident that the sports facilities primarily serve the institutional/community use and would be retained by the Vincentian Order. For this reason, a separate planning application has been prepared and submitted for all-weather pitches and a sports hall. Environmental issues were also identified by DCC in the assessment of the application, including a potential impact on the integrity of the Natura 2000 network having regard to Brent Geese and a lack of amenity public open space serving the development.



Figure 2-5: Site Layout Plan for planning Reg. Ref. 4185/15 (Reddy Architecture, 2015)

2.7.4.2 Alternative 2: Refused Permission (ABP Ref. 302225-18)

The aforementioned matters were addressed in a following proposal, ABP Ref. 302225-18, which provided 15,965m² of public open space compared to 4,534m² in the withdrawn scheme. The potential impact on Brent Geese was assessed in the EIAR and the Natura Impact Statement which were submitted with the application. The proposed Landscape Masterplan for the alternative design (BSM Landscape Architects, 2017) is illustrated in Figure 2-6.



Figure 2-6 Landscape Masterplan for alternative design (ABP Ref. 302225-18) (BSM Landscape Architects, 2017)

However, on assessment, ABP was not satisfied that Proposed Development would not have an impact (alone or in combination with other plans and projects) on relevant species of Special Conservation Interest (SCI) or on European Sites within the zone of influence of the Proposed Development. In particular, ABP stated that it could not be satisfied beyond a reasonable scientific doubt that the Light-bellied Brent Geese that would be displaced by the Proposed Development, would successfully relocate to other sites and/or that these sites would represent suitable alternatives to the subject site, which was acknowledged to be of one of eight ex-situ feeding sites of major importance in the Dublin area.

2.7.4.3 Proposed Layout:

In the chosen layout for the Proposed Development, as illustrated in Figure 2-7, the apartment blocks are distributed across a network of streets and spaces, with pedestrian priority and local vehicular access only. Car parking is primarily accommodated at basement level, keeping the grade-level public realm largely free of vehicles. The Proposed Development has been designed to facilitate potential for future public use by incorporating landscaping and public realm improvements, particularly having regard to the extensive communal and public amenity areas, and a significant new public open space pro-vision to the east of the Site.



Figure 2-7 Chosen Layout (Source: Landscape Design Statement, August 2022)

The open space for the Proposed Development, which accounts for approximately one third of the site (31.15%), has been planned as a permeable and welcoming piece of public realm, which will enhance the health and wellbeing of local residents and visitors and will create habitable, quality spaces which respond to human comfort. The 'Great Lawn' is a large expanse of open space at the heart of the development which will be open to the public 24/7. A natural play area has been incorporated to the northern 'Forest Gardens'. A number of potential routes through the site of the Proposed Development have been identified to benefit connections with its surroundings and provide a better amenity for the wider community.

In relation to the issues raised by ABP regarding the potential impact of the Proposed Development on relevant species of SCI or on Natura 2000 sites, Enviroguide Consulting undertook a comprehensive suite of wintering bird surveys between 2018 and 2022, and reviewed data provided in Scott Cawley Ltd collected during surveys undertaken between 2012 and 2017, to inform and assist the competent authority in carrying out its Appropriate Assessment, as to whether or not the Proposed Development will adversely affect the integrity

of Natura 2000 sites either alone or in combination with other plans and projects, taking into account the conservation objectives of the Natura 2000 sites (*Enviroguide Consulting, 2022*).

Enviroguide Consulting has determined that the Proposed Development will not adversely affect the integrity of the of Natura 2000 sites either alone or in combination with other plans and projects, considering the conservation objectives of the Natura 2000 sites. Enviroguide Consulting has also determined while an existing foraging resource for other SCI species (i.e., Curlew, Oystercatcher, Black-tailed Godwit and Black-headed Gull) will be lost as a result of the Proposed Development, the results of wintering bird surveys demonstrated that this site is not considered to be of High or Major Importance for any of these species.

It is therefore considered, based on both the numbers and frequency of occurrence of SCI species recorded at the Proposed Development site, that the loss of ex-situ habitat will not impact on the conservation objective attributes of "Distribution" and "Population Trend" of any of the SCI species recorded at the Proposed Development site.

The Natura Impact Statement that accompanies this application details in full the results of the wintering bird surveys and the reasoned opinions of the ecological experts in relation to potential impacts from the Proposed Development on relevant species of SCI or on Natura 2000 sites.

2.7.5 Alternative Process

The location on which the majority of the development is proposed is zoned Z15 in the Dublin City Development Plan 2016 – 2022 (with a small section in zone Z9 to provide for the routing of a surface water discharge from the site via St. Anne's Park to the Naniken River), which zoning includes residential development as 'Open for Consideration' within the associated land use matrix. Due to the nature of the current proposal, i.e., the development of residential dwellings and supporting community facilities including childcare and residential care for the elderly, it was not considered necessary to consider alternative processes for the Proposed Development.

2.8 The Existence of the Project

The Construction Phase will last approximately 18 months. During the Construction Phase of the Proposed Development there will be approximately 300 jobs created, with a maximum of 150 construction workers onsite at any one time at the peak of the construction works. Hence, for the duration of the Construction Phase of the Proposed Development there will be a short-term increase in construction employment in the area, which will have a positive impact, both directly and indirectly, on the local economy.

The primary likely significant environmental impacts of the Proposed Development are fully addressed in the relevant specialist Chapters of this EIAR. These impacts relate to Population & Human Health, Land & Soil, Hydrology and Hydrogeology, Landscape & Visual, Noise, Air Quality & Climate, Traffic, Built Services and Waste Management.

The Operational Phase of the Proposed Development will result in an increase in the population of the area, and it will have a positive impact on the long-term supply needs of housing in the greater Dublin area. The Proposed Development includes a childcare facility and nursing home, which will create employment in the local area and will also provide much

needed care services for children and the elderly. Additionally, the open spaces provided in the Proposed Development will create habitable, quality spaces which will have a positive impact on the health and wellbeing of current and future local residents.

The Proposed Development also has the potential for cumulative, secondary and indirect impacts, which in many instances can be difficult to quantify due to complex inter-relationships. The potential cumulative impacts primarily relate to traffic, dust, noise and other nuisances from the Construction Phase of the Proposed Development, with other planned or existing projects, and each of the technical EIAR chapters has regard to these in the assessment and mitigation measures proposed.

All cumulative, secondary and indirect impacts are unlikely to be significant and have been fully addressed in the relevant specialist Chapters of this EIAR and recapitulated in Chapter 14 (Interactions). As such, with the necessary mitigation for each environmental aspect, it is anticipated that the potential cumulative impact of the Proposed Development in conjunction with the other planned and permitted developments adjoining the site of the Proposed Development will be minimal.

3 PLANNING AND POLICY CONTEXT

The planning and policy context gives an overview of the relevant legislation that supports the Proposed Development at a local, regional and national level and sets out the strategic and statutory context governing the planning and development of the Proposed Development.

Raheny 3 Limited Partnership are applying for permission for development on lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5. The site is bound to the north, east and south by St Anne's Park and to the west by residential development at The Meadows, Sybil Hill House (a Protected Structure) and St Paul's College. Vehicular access to the site is from Sybil Hill Road.

The Proposed Development consists of the construction of a residential and nursing home development set out in 7 no. blocks, ranging in height from 4-7 storeys to accommodate 580 no. apartments, residential tenant amenity spaces, a crèche and a 100-bed nursing home. The site will accommodate car parking spaces, bicycle parking spaces, storage, services and plant areas at both basement and podium level.

Landscaping will include extensive communal amenity areas, and a significant public open space provision on the east and south of the site. The proposed application includes all site landscaping works, green roofs, substations, boundary treatments, lighting, servicing, signage, surface water attenuation facilities and associated and ancillary works, including site development works and services above and below ground. For a full description of the Proposed Development please refer to the Statutory Notices.

The Site is located within the administrative area of Dublin City Council (DCC). The Planning and Policy Context Chapter describes how the Proposed Development complies with the stated and statutory requirements of Dublin City Council (DCC) with respect to planning and sustainable development. The relevant local planning policy with which the Proposed Development complies primarily comprises the Dublin City Development Plan 2016 – 2022 and the Draft Dublin City Development Plan 2022-2028. The Proposed Development Site is located on land zoned Z15- Institutional and Community, within the Dublin City Development Plan 2016 – 2022. This is included in the Core Strategy with regards to the availability of land to deliver residential development. A small section of the application site is zoned Z9 as this includes lands within St. Anne's Park required to provide for the routing of a surface water discharge from the site via St. Anne's Park to the Naniken River. No residential development is proposed on the lands contained within the application boundary which are zoned Z9.

Therefore, the Proposed Development is consistent with the policies and zoning objectives outlined in the Dublin City Development Plan 2016 – 2022 and the new Draft Dublin City Development Plan 2022-2028.

The Proposed Development is a Large-scale Residential Development. The definition of Large-scale Residential Development (LRD) is largely similar to Strategic Housing Development (SHD), i.e., developments of 100 housing units or more, or student accommodation developments comprising 200 bed spaces or more, or a combination of same. The two main changes under the new LRD arrangements will allow for:

- Up to 30% of the gross floor space of the Proposed Development to be for other uses, instead of the 15% cap under the SHD arrangements.
- Mixed developments combining housing and student accommodation to be classified as an LRD where the threshold is met for either element.

The new LRD arrangements comprise three stages– pre-application consultation stage, planning application stage and appeal stage. Commencement of the Large-scale Residential Development provisions in the Planning and Development (Amendment) (Large-scale Residential Development) Act 2021 (No. 40 of 2021), was signed into law by the President on 14 December 2021.

A formal Large Scale Residential Development (LRD) Pre-Consultation Meeting was held with Dublin City Council on 21st June 2022.

Planning Application Boundary

As Dublin City Council will note from the Application Form and submitted Site Ownership Map, some of the lands within the site boundary include lands outside the applicant's ownership both within the public roadway and on adjacent lands. These lands are within the control of Orsigny CLG and Dublin City Council who have consented to their inclusion (refer to letters of consent which are included with this application).

3.1 National and Regional Planning Policy Context

3.1.1 National Planning Context

3.1.1.1 National Framework Plan

The *Project Ireland 2040: National Planning Framework* (NPF), published on 16th February 2018, replaces the previous National Spatial Strategy. It is the Government's high-level strategic plan for shaping the future growth of the country to the year 2040. It will guide public and private investment and create and promote opportunities for people, and to protect and enhance the environment.

The NPF outlines key future planning and development place-making policies for the Eastern and Midland Regions, including a major new policy emphasis on renewing and developing existing settlements with the target of achieving at least 40% of all new housing to be delivered within the existing built-up areas of cities, towns and villages on infill and/or brownfield sites.

The National Strategic Outcomes as set out in the NPF are:

- Compact Growth;
- Enhanced Regional Accessibility;
- Strengthened Rural Economies and Communities;
- High-Quality International Connectivity;
- Sustainable Mobility;
- A Strong Economy, supported by Enterprise, Innovation and Skills;
- Enhanced Amenities and Heritage;
- Transition to a Low Carbon and Climate Resilient Society;

- Sustainable Management of Water, Waste, and other Environmental Resources; and
- Access to Quality Childcare, Education and Health Services.

The NPF - Project Ireland 2040 requires delivery of a baseline of 25,000 homes annually to 2020, followed by a likely level of 30-35,000 annually up to 2027. To achieve the objective of compact growth, 40% of future housing delivery is to be delivered within and close to the existing built-up areas. Within Dublin, the NPF states that the city needs to *'accommodate a greater proportion of the growth it generates within its metropolitan boundaries and to offer improved housing choice.'*

National Policy **Objective 4** in this regard states:

'Ensure the creation of attractive, liveable, well designed, high-quality urban places that are home to diverse and integrated communities that enjoy a high quality of life and well-being.'

The Proposed Development supports and assists in achieving the following objectives:

National Policy **Objective 11** in this regard states:

'In meeting urban development requirements, there will be a presumption in favour of development that can encourage more people and generate more jobs and activity within existing cities, towns and villages, subject to development meeting appropriate planning standards and achieving targeted growth.'

National Policy **Objective 13** in this regard states:

'In urban areas, planning and related standards, including in particular building height and car parking will be based on performance criteria that seek to achieve well-designed high quality outcomes in order to achieve targeted growth. These standards will be subject to a range of tolerance that enables alternative solutions to be proposed to achieve stated outcomes, provided public safety is not compromised and the environment is suitably protected.'

The NPF also includes the following objective in relation to social infrastructure needs:

National Policy **Objective 33** states:

'Prioritise the provision of new homes at locations that can support sustainable development and at an appropriate scale of provision relative to location.'

As defined in the NPF, ideally, future homes will be located in places that can support sustainable development - places which support growth, innovation and the efficient provision of infrastructure, are accessible to a range of local services, can encourage the use of public transport, walking and cycling, and help tackle climate change.

The Proposed Development supports the policies and goals outlined in the NPF. The Proposed Development is located in an area well served by the necessary infrastructure and is explicitly zoned for uses of this nature.

Further details on how the Proposed Development supports and complies with planning policy and legislation are detailed in the planning report by Brady Shipman Martin (2022) submitted separately as part of this application.

3.1.1.2 Sustainable Urban Housing: Design Standards for New Apartments (2020)

The Design Standards for New Apartments Guidelines were originally issued in 2018, as an update of the *Sustainable Urban Housing: Design Standards for New Apartments Guidelines*, published in 2015. These 2020 Guidelines are issued as a technical update in relation to 'Shared Accommodation/Co-living'. These Guidelines promote sustainable living patterns with the objective to curb urban sprawl and update previous guidance in the context of greater evidence and knowledge of current and likely future housing demand in Ireland taking account of the Housing Agency National Statement on Housing Demand and Supply, the Government's action programme on housing and homelessness Rebuilding Ireland and Project Ireland 2040 and the National Planning Framework, published since the 2015 guidelines. The apartment design parameters addressed in these Guidelines include the following:

- General locational consideration;
- Apartment mix within apartment schemes;
- Internal space standards for different types of apartments;
- Dual aspect ratios;
- Floor to ceiling height;
- Apartments to stair/lift core ratios;
- Storage spaces;
- Amenity spaces including balconies/patios;
- Car parking; and
- Room dimensions for certain rooms

The Proposed Development has been designed to these current standards. This planning application is accompanied by a Housing Quality Assessment (HQA), prepared by Hawkins Brown Architects, and forms part of the Hawkins Brown Design Statement, which demonstrates the compliance of the Proposed Development with the relevant quantitative standards required under the Apartment Guidelines 2020.

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

The Urban Development and Building Heights – Guidelines for Planning Authorities set out national planning policy guidance on building heights with regard to urban areas. The Guidelines support the strategic policy framework set out in Project Ireland 2040 by strengthening policies for consolidation of existing built-up areas, rather than an unsustainable development pattern whereby many cities and towns continue to grow outwards.

In relation to individual Planning Applications, the Guidelines identify a presumption favouring buildings of increased height in our town/city cores and other urban locations with good public transport accessibility. In addition, the Guidelines set out national planning policy that '*Applies those requirements in setting out relevant planning criteria for considering increased building height in various locations but principally (a) urban and city-centre locations and (b) suburban and wider town locations.*' The Guidelines seek to secure '*...compact and sustainable urban growth*', which means '*...either reusing or redeveloping existing sites and buildings, in well-serviced urban locations, particularly those served by good public transport and supporting services, including employment opportunities.*'

The Proposed Development will assist in achieving growth within an already built-up commuter area such as Dublin City Centre. In the context of the Proposed Development, this application is considered to meet the criteria of the Guidelines. The Site of the Proposed Development is well served by public transport - '*frequent service and good links to other modes of public transport*' and it is designed '*to 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*'. The Proposed Development is served by four bus stops within the local area. The nearest bus stops are to the north of the development on the R105 Howth Road. The Proposed Development is also served by the Harmonstown Dart Station and Killester Dart Station. This provides access to several areas in North and South Dublin. It is approximately 800m (c. 10-minutes walking) from the Proposed Development to Harmonstown Dart Station and 950m (c. 12-minutes walking) to Killester Dart Station (Traffic and Transport Assessment, Waterman Moylan Engineering Consultants, 2022).

3.2 Housing for All | A New Housing Plan for Ireland (2021)

Housing for All - a New Housing Plan for Ireland (published in September 2021) is the government's housing policy to 2030. It is a multi-annual, multi-billion-euro plan which will improve Ireland's housing system and deliver more homes of all types for people with different housing needs.

The overall aim of Housing for All is "*Everyone in the State should have access to a home to purchase or rent at an affordable price, built to a high standard and in the right place, offering a high quality of life.*" Housing for All provides four pathways to achieving four overarching objectives:

- *Supporting Homeownership and Increasing Affordability;*
- *Eradicating Homelessness, Increasing Social Housing Delivery and Supporting Social Inclusion;*
- *Increasing New Housing Supply; and*
- *Addressing Vacancy and Efficient Use of Existing Stock.*

To meet the targets as set out in the National Planning Framework and the measures discussed in the Housing Plan, Ireland needs an average of 33,000 homes constructed per annum until 2030.

The plan sets out the Government's intention to replace the SHD process with new planning arrangements for large-scale residential developments (LSRD) of 100+ homes (or 200+ student accommodation bed spaces) with a view to maintaining the efficiency of decision-making for developments of this nature, while returning decision-making to the local level and securing associated benefits in terms of public participation. This change in process came into effect from the 17th of December 2021. This Stage 2 Request is now made in line with the requirements of the for Large-Scale Residential Development process (Planning Report, Brady Shipman Martin, 2022).

The Proposed Development will contribute to the number of residential homes being constructed and will assist in achieving the Housing Policy Objectives outlined in the Plan. The Government's *Housing for All Plan* as well as the policies outlined in the National Planning Framework support the delivery of residential development, such as that proposed. The

Proposed Development is located in close proximity to quality public transport routes (the area is well serviced with public transport, including access to rail, buses, and established walking and cycling paths) and within an existing urban area.

3.2.1 Design Manual for Urban Roads & Streets (DMURS) (2013)

The Design Manual for Urban Roads & Streets (DMURS) was prepared by the Department of Transport, Tourism and Sport, together with the Department of Environment, Community and Local Government in 2013 for Urban Roads and Streets and sets out design guidance and standards for urban roads/streets in Ireland. It also outlines practical design measures to encourage more sustainable travel patterns in urban areas.

The Traffic and Transport Assessment, prepared by Waterman Moylan Consulting Engineers (2022), provides further detail in respect of the compliance of the Proposed Development with this Design Manual. For example, the Proposed Development will use the existing site access to Sybil Hill House access road. This is to the north of the St. Pauls College entrance. The existing site access road will connect to the Proposed Development. The sightline requirements for a new priority junction on 50kph road are identified within DMURS which recommends a visibility splay of 49m x 2.4m on roads with bus routes. Visibility splay of this junction has been designed in accordance with DMURS requirements. Details of the junction layout can be seen on Waterman Moylan drawings accompanying this planning application. Likewise, all footpaths for the Proposed Development will be provided in accordance with Section 4.3.1 of the DMURS which suggests that a minimum 1.8m footpath should be provided.

3.2.2 National Policy Position on Climate Action & Low Carbon Development and Climate Act 2021

The EU, in 2014, agreed to the “2030 Climate and Energy Policy Framework” (EU 2014). The European Council endorsed an EU target of at least a 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990. The Paris Agreement was established in 2015 and is an important milestone in international climate change agreements. To meet the Paris Agreement’s objectives and assist in reducing Ireland’s GHG emissions, the Irish government has established and outlined several policies at a national level.

In 2014, the Government adopted the National Policy Position on Climate Action and Low Carbon Development. The Climate Action and Low Carbon Development Act 2015 was adopted to provide for the approval of plans by the government in relation to climate change. This Act establishes the fundamental national objective of achieving the transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050. It sets out the context for the objective, clarifies the level of greenhouse gas (GHG) mitigation ambition envisaged and establishes the process to pursue and achieve the overall objective. Specifically, the Policy Position envisages that policy development will be guided by a long-term vision based on:

- an aggregate reduction in carbon dioxide (CO₂) emissions of at least 80% (compared to 1990 levels) by 2050 across the electricity generation, built environment and transport sectors; and
- in parallel, an approach to carbon neutrality in the agriculture and land-use sector, including forestry, which does not compromise capacity for sustainable food production.

The National Mitigation Plan (DCCA, 2017) and the National Adaptation Framework (DCCA, 2018) were also established under this Act.

In addition, on Thursday 4 November 2021, the government launched the Climate Action Plan 2021, an ambitious plan to put Ireland on a more sustainable path, cutting emissions, creating a cleaner, greener economy and society and protecting us from the devastating consequences of climate change.

The Climate Action Plan follows the Climate Act 2021, which commits Ireland to a legally binding target of net-zero greenhouse gas emissions no later than 2050, and a reduction of 51% by 2030. These targets are a key pillar of the Programme for Government. By 2030, the government aims to achieve the following:

- Cutting greenhouse gas emissions by at least 30%
- Reaching a target of at least 32.5% energy efficiency
- Delivering 70% renewable electricity

An Energy Analysis Report has been undertaken by Engineering Design Partnership (August 2022) in order to demonstrate the Proposed Development's compliance to Building Regulations Technical Guidance Document (TGD) Part L 2019. The analysis determined that through the following energy and servicing strategies that an A2/A3 BER should be obtainable:

- Improvements to building thermal transmittance (U-Values), air permeability and thermal bridging with respect to Part L defaults.
- De-Centralised Heating and Hot Water Plant arrangement to each apartment.
- Exhaust Air Heat Pumps (EAHP's) plant delivering all the annual heating and hot water requirement.
- Exhaust Air Heat Pump extracting stale air from apartment creating negative pressure. Passive make-up air from façade providing fresh air to all liveable spaces.
- Photovoltaic (PV) array for electricity generation, centralised to connect to Landlord systems. Minimum required 6/8 no. panels total (330 W peak/ 1.68m² each) per landlord core allocated at roof level.

Further information is available within the Energy Analysis Report (Engineering Design Partnership, August 2022), and the Building Lifecycle Report (Aramark, 2022) that will be submitted as part of this application.

3.2.2.1 The Planning System & Flood Risk Management (2009)

The Planning System and Flood Risk Management Guidelines were issued under Section 28 of the Planning & Development Act 2000 (as amended). The Planning System and Flood Risk Management Guidelines require the planning system at all levels to avoid development in areas at risk of flooding, particularly floodplains unless there are proven wider sustainability grounds that justify appropriate development and where the flood risk can be reduced or managed to an acceptable level without increasing flood risk elsewhere; adopt a sequential approach to flood risk management when assessing the location for new development based on avoidance, reduction and mitigation of flood risk; and incorporate flood risk assessment into the process of making decisions on planning applications and planning appeals.

A Site-Specific Flood Risk Assessment (SSFRA) has been prepared in accordance with these guidelines by Waterman Moylan Consulting Engineers Limited (2022) and is included with the

planning application. This assessment identifies the risk of flooding at the site from various sources and sets out possible mitigation measures against the potential risks of flooding. Sources of possible flooding include coastal, fluvial, pluvial (direct heavy rain), groundwater and human/mechanical errors.

3.2.2.2 Sustainable Residential Development in Urban Areas, Guidelines for Planning Authorities, 2009 and Urban Design Manual, A Best Practice Guide

The Sustainable Residential Development in Urban Areas guidelines detail the key principles for new residential developments in urban areas while its accompanying Urban Design Manual translates the Guidelines into practice. The Guidelines encourage increased densities in appropriate zoned residential land within inner suburban areas of cities, proximate to existing and due to be improved public transport corridors. These guidelines, together with the accompanying best practice Design Manual, provide a sound basis on which planners, designers and developers can translate ideals of sustainable living into a practical reality. They constitute the new gold standard for sustainable residential development in Ireland.

The Proposed Development is located 5km from Dublin City Centre within the Dublin Metropolitan Area in an area served by the DART Rail (Harmonstown) and the Howth Road Quality Bus Corridor (QBC), which bus routes serve Dublin City Centre. The Proposed Development is adjacent to St Paul's College (Secondary School) and St Anne's Park. As such, it would be categorised as inner suburban / greenfield.

The Proposed Development is a high-quality, sustainable development that achieves the key planning principles and objectives as set out in the County Development Plan.

3.2.2.2.1 Urban Design Manual (A Best Practice Guide) (2009)

The Urban Design Manual was published as a companion document to the Guidelines for Sustainable Residential Development in Urban Areas. The Manual is intended to assist in the assessment of residential applications, to identify the principles and criteria that are important in the design of housing and to set out a design framework for a new residential neighbourhood. These guidelines are also incorporated in the relevant development plan and/or local area plans and outline key considerations in planning application assessments.

The Manual sets out 12 key urban design criteria that all new residential developments should be tested against in order to establish if the scheme is a well-designed proposal, including Context, Connections, Inclusivity, Variety, Efficiency, Distinctiveness, Layout, Public Realm, Adaptability, Privacy / Amenity, Parking and Detailed Design.

It is considered that full cognisance of the Urban Design Manual has been taken by the design team in particular the architects, landscape architects and engineers. Integration of the 12 criteria into the Proposed Development is set out in the Architects Design Statement (Hawkins/ Brown Architects, 2022) and Landscape Design Report (Niall Montgomery + Partners Landscape Architects, in collaboration with collaborate with Hawkins/ Brown Architects, 2022), that will be submitted as part of this planning application.

3.2.2.3 Smarter Travel, A Sustainable Transport Future. A New Transport Policy for Ireland 2009-2020 (2009)

The Smarter Transport objective contained within Smarter Travel – A Sustainable Transport Future: A New Transport Policy for Ireland 2009-2020 outlines the Government vision that the key goals to achieve transport sustainability are:

- i) to reduce overall travel demand
- ii) to maximise the efficiency of the transport network
- iii) to reduce reliance on fossil fuels
- iv) to reduce transport emissions and
- v) to improve accessibility to transport.

The key targets that the Smarter Travel Policy sets to achieve are:

- Future population and employment growth will predominantly take place in sustainable compact forms, which reduce the need to travel for employment and services
- 500,000 more people will take alternative means to commute to work to the extent that the total share of car commuting will drop from 65% to 45%
- Alternatives such as walking, cycling and public transport will be supported and provided to the extent that these will rise to 55% of total commuter journeys to work. The total kilometres travelled by the car fleet in 2020 will not increase significantly from current levels
- A reduction will be achieved on the 2005 figure for greenhouse gas emissions from the transport sector.

The Proposed Development encourages sustainable and smarter travel by providing a high-density development on an underutilised site in close proximity to key employment zones and existing high frequency public transport routes, and through the reduction in car parking and provision of significant cycle facilities (Planning Report, Brady Shipman Martin, 2022).

3.2.2.4 National Investment Framework for Transport in Ireland (NIFTI) December 2021

The National Investment Framework for Transport in Ireland (NIFTI), published on 21 December 2021, sets out clear principles for the consideration of future transport investment and is closely aligned with key Government policy priorities and commitments, such as the Climate Action Plan and the National Development Plan.

The strategic investment priorities articulated by NIFTI have been developed to support the realisation of the NPF and address key transport challenges identified through extensive supporting analysis. The four NIFTI priorities for future land transport investment are:

- Decarbonisation;
- Protection and Renewal;
- Mobility of People and Goods in Urban Areas; and
- Enhanced Regional and Rural Connectivity.

The Proposed Development aligns with the principles as set out by NIFTI. In particular, the Proposed Development assists in achieving one of the key outcomes of the NPF – Compact Growth. NIFTI Investment Priority: Mobility of People and Goods in Urban Areas' outlines

important measures such as '*walking and cycling infrastructure expansion, and the provision of better and more comprehensive public transport services*' in order to tackle spatial constraints and urban congestion issues. The Proposed Development has been designed to encourage sustainable modes of transport such as cycling and walking through the site. The surrounding pedestrian network provides pathways both sides of the road and pedestrian crossings where necessary - Sybil Hill Road has pedestrian pathways separated by grass verges either side of the road, there are also pathways through St. Anne's Park to the West of the Proposed Development.

Along the Howth Road there is no grass verge between the pedestrian pathways and the road. However, there are bus lanes for the majority of the road. There are also several signalised pedestrian crossings available to cross the road.

Surrounding the Proposed Development are several areas of cycle lanes. These cycle lanes are along Howth Road to the North of the development within a combination of Bus Lane and Cycle Lane (within Bus Lane). This cycle lane continues into the city centre and north towards Howth (Traffic and Transport Assessment, Waterman Moylan Consulting Engineers, 2022).

Therefore, due to the strategic location and good public transport available near the Proposed Development site, the Proposed Development will optimise existing transport services and assists in achieving the NFP and Climate Action Plan key policy objectives and commitments.

The Traffic and Transport Assessment further demonstrates the consistency of the Proposed Development with these policy objectives. A Traffic and Transport Assessment has been prepared by Waterman Moylan Consulting Engineers Limited and is submitted with this planning application.

3.2.2.5 Transport Strategy for the Greater Dublin Area 2016 – 2035

As set out in the Planning Report compiled by Brady Shipman Martin (2022), the Transport Strategy for the Greater Dublin Area 2016 – 2035, as prepared by the National Transport Authority, provides a framework for the planning and delivery of transport infrastructure and services in the Greater Dublin Area (GDA) over the next two decades. It also provides a transport planning policy around which statutory agencies involved in land use planning, environmental protection, and delivery of other infrastructure such as housing, water and power, can align their investment priorities. It is, therefore, an essential component, along with investment programmes in other sectors, for the orderly development of the Greater Dublin Area over the next 20 years.

The Strategy identifies the challenges for transport in the GDA as being:

- An assumed return to sustained economic growth;
- Substantial population growth;
- Full employment;
- That no one is excluded from society, by virtue of the design and layout of transport infrastructure and services or by the cost of public transport use; and
- That the environment in the GDA is protected and enhanced.

It is considered that since the publication of the Strategy in 2016 economic and population growth has continued to substantially increase and as such the objective of the plan are critical to ensuring a functional GDA region.

As such the Proposed Development is consistent with the objectives of the GDA Transport Strategy by providing residential development in proximity to existing employment and public transport networks thereby reducing the requirement of the car and encouraging a shift to more sustainable transport methods (Planning Report, Brady Shipman Martin, 2022).

3.2.3 Regional Planning Context

3.2.3.1 Eastern & Midland Regional Assembly - Regional Spatial & Economic Strategy (RSES) (2019)

The Eastern & Midland Regional Assembly (EMRA) Regional Spatial & Economic Strategy 2019-2031 (hereafter RSES) was adopted in 2019 to ensure the policies and objectives of the NPF are implemented at a regional level.

The Strategy identifies that the Region 'is home to over 800,000 households, with 4 out of 5 living in conventional housing while apartments account for around 18% of our housing stock. One of the challenges facing the Region is the continued growth rates of household formation coupled with a severe slowdown in the development of new housing stock during the economic recession, resulting in housing supply and affordability pressures in both sale and rental markets, particularly in Dublin and urban areas but affecting all of the Region'.

The RSES sets out an ambitious target to achieve compact growth with 50% of housing to be provided within or contiguous to the built-up area of Dublin city and suburbs. Policy objectives in relation to the Proposed Development and Housing Delivery include:

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

RPO 5.4: "Future development of strategic residential development areas within the Dublin Metropolitan area shall provide for higher densities and qualitative standards as set out in the 'Sustainable Residential Development in Urban Areas', 'Sustainable Urban Housing; Design Standards for New Apartments' Guidelines, and Draft 'Urban Development and Building Heights Guidelines for Planning Authorities.'"

RPO 5.5: "Future residential development in the Dublin Metropolitan Area shall follow a clear sequential approach, with a primary focus on the consolidation of Dublin and suburbs, supported by the development of Key Metropolitan Towns in a sequential manner as set out in the Metropolitan Area Strategic Plan (MASP) and in line with the overall Settlement Strategy for the RSES."

The Proposed Development will contribute to the target to achieve compact growth with 50% of housing to be provided within or contiguous to the built-up area of Dublin City and suburbs.

The Proposed Development has been designed in accordance with the above guidelines, objectives of the NPF and the RSES EMRA, and as set out in the Planning Report compiled by Brady Shipman Martin (2022), "*this application enables the consolidation of a strategically located site within the urban envelope northeast of Dublin City centre.*"

3.2.4 Local Level

3.2.4.1 Dublin City Council Development Plan 2016-2022

The Dublin City Council Development Plan is the statutory planning policy document for the City. It sets out the policies and objectives for the proper planning and sustainable development of the City from 2016 to 2022. The Dublin City Development Plan 2022-2028 is also currently available in Draft format and has been consulted in relation to the Proposed Development. The public consultation period for this Draft Plan ended on 14th February 2022.

The Dublin City Development Plan is the statutory planning policy document pertaining to the Proposed Development on lands to the east of St. Paul's College, Sybil Hill Road, Raheny, Dublin 5. It sets out policies and objectives to guide how and where development will take place in the city over the lifetime of the Plan.

3.2.4.1.1 Requirements for Development of Lands Zoned Z15

The majority of the application site, (including the adjoining St Paul's College and the Vincentian Order in Sybil Hill House), is zoned objective Z15 in the Dublin City Development Plan 2016-2022. This Zoning Objective is "*To protect and provide for institutional and community uses*". Under the zoning objective, the proposed residential use is Open for Consideration.

A small section of the site to the northeast, is zoned Z9. This Zoning Objective is "*To preserve, provide and improve recreational amenity and open space and green networks.*" No residential development is proposed on the lands contained within the application boundary which are zoned Z9.

As set out in the Dublin City Development Plan 2016-2022, where there is an existing institutional and/or community use, any Proposed Development for 'open for consideration' uses on part of the landholding, will be required to demonstrate to the planning authority how the proposal is in accordance with and assists in securing the aims of the zoning objective; how it secures the retention of the main institutional and community uses on the lands, including space for any necessary expansion of such uses; how it secures the retention of existing functional open space e.g. school playing fields; and the manner in which the nature and scale of the proposal integrates with the surrounding lands. A masterplan may assist in demonstrating how the requirements of this paragraph may be satisfied.

A Masterplan entitled "*Masterplan Approach for Redevelopment*" by Hawkins Brown is included with this application and addresses the provisions of the Z15 Zoning Objective. The Masterplan relates to all of the lands in the original St Paul's College campus that are subject to the Z15 zoning.

The Masterplan represents the intentions of the main institutional stakeholder of the lands, working in co-operation with the other landowners within the subject Z15 area and with Dublin City Council to deliver a vision for the integrated and sustainable development of the lands, while retaining the main institutional use in an enhanced condition and setting. The Institutional Owners confirm that the main institutional, educational, and community uses on the lands, including space for any necessary expansion of such uses will be maintained and improved in the future by Orsigny/The Vincentian Order.

This has been considered comprehensively in the proposed approach as set out in this LRD Stage 3 Application and is detailed in this report in Section 7.2, and in the Masterplan Report (Hawkins Brown, 2022).

3.2.4.1.2 Policy in relation to Residential Development

The City Development Plan Policy Objectives seeks to build upon and enhance the National Planning Framework (NPF) and the Regional Spatial and Economic Strategy (RSES). In order to achieve compact growth, 50% of housing must be provided for within the built-up area of Dublin City and Suburbs. In order to achieve this goal, the Plan recognises that housing delivery in Dublin City should accord with the provisions of the Core Strategy which sets out the appropriate locations for future potential development.

In this regard it is the policy of DCC:

QH7: *To promote residential development at sustainable urban densities throughout the city in accordance with the core strategy, having regard to the need for high standards of urban design and architecture and to successfully integrate with the character of the surrounding area.*

QH8: *To promote the sustainable development of vacant or under-utilised infill sites and to favourably consider higher density proposals which respect the design of the surrounding development and the character of the area.*

QH18: *To promote the provision of high quality apartments within sustainable neighbourhoods by achieving suitable levels of amenity within individual apartments, and within each apartment development, and ensuring that suitable social infrastructure and other support facilities are available in the neighbourhood, in accordance with the standards for residential accommodation.*

QH19: *To promote the optimum quality and supply of apartments for a range of needs and aspirations, including households with children, in attractive, sustainable, mixed-income, mixed-use neighbourhoods supported by appropriate social and other infrastructure.*

QH20: *To ensure apartment developments on City Council sites are models of international best practice and deliver the highest quality energy efficient apartments with all the necessary infrastructure where a need is identified, to include community hubs, sports and recreational green open spaces and public parks and suitable shops contributing to the creation of attractive, sustainable, mixed-use and mixed-income neighbourhoods.*

The Proposed Development is in line with the objectives as set out in the Development Plan.

3.3 The EIA Directive

The EIA Directive (85/337/EEC) has been in force since 1985 and applies to a wide range of defined public and private projects. The EIA Directive was amended in 1997, 2003, 2009, 2011 and 2014 by Directives 97/11/EC; 2003/35/EC, 2009/31/EC, 2011/92/EU and 2014/52/EU. The EIA Directive requires environmental impact assessments to be carried out for certain projects as listed in Annex I of the Directive. The EIA Directive, and amendments, are transposed into Irish law through the Planning and Development Acts 1996 to 2019 in particular S.I. No. 296 of 2018.

Schedule 5, Part 1, of the Planning Regulations transposes Annex 1 of the EIA Directive directly into Irish planning legislation. An EIAR is required to accompany a planning application for development of a class set out in Schedule 5, Part 1 of the Planning Regulations which exceeds a limit, quantity or threshold set for that class of development.

Schedule 5, Part 2 of the Planning Regulations defines projects that are assessed on the basis of set mandatory thresholds for the project class listed below:

“Schedule 5, Part 2 - Infrastructure projects

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

The Proposed Development consists of the construction of a residential and nursing home development set out in 7 no. blocks, ranging in height from 4 to 7 storeys, to accommodate 580 no. apartments, residential tenant amenity spaces, a crèche, and a 100-bedspace nursing home. As the Proposed Development consists of the construction of 580 dwelling units, it is above the 500 dwelling unit threshold, and accordingly a mandatory EIAR is required.

In August 2018 the Department of Housing, Planning and Local Government published a document entitled ‘*Guidelines for Planning Authorities and An Bord Pleanála’ on carrying out Environmental Impact Assessment*’. This document has been used in the preparation of this EIAR.

In May 2022, the EPA published the Final “*Guidelines on the information to be contained in Environmental Impact Assessment Reports*”. The Guidelines have been updated following the introduction of transposing legislation and are now formally adopted. The preparation of these updated Guidelines has involved extensive consultation. Participants in this consultation included government departments, national agencies, regional and local government, independent statutory bodies, non-governmental organisations, members of the public, developers and bodies representing various professional, industrial and sectoral groups. The Guidelines emphasise the importance of the methods used in the preparation of an EIAR to ensure that the information presented is adequate and relevant. This document has been used in the preparation of this EIAR.

The Revised EIA Directive defines EIA as a process. Article 1(2) (g) states that EIA means:

“(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”.

The Revised EIA Directive requires the EIA to identify, describe and assess, in an appropriate manner and in light of each individual case, the direct and indirect significant effects of the Proposed Development on factors of the environment including:

- (a) population and human health;
- (b) biodiversity, with particular attention to species and habitats protected under the Habitats and Birds Directives;
- (c) land, soil, water, air and climate;
- (d) material assets, cultural heritage and the landscape;
- (e) the interaction between the factors referred to in points (a) to (d).

The requirements of the Revised EIA Directive in relation to each Chapter are addressed in the EIAR as follows;

- Chapter 2: Description of Development
- Chapter 3: Planning and Policy Context
- Chapter 4: Population and Human Health
- Chapter 5: Biodiversity;
- Chapter 6: Land and Soils;
- Chapter 7: Hydrology;
- Chapter 8: Air Quality and Climate;
- Chapter 9: Noise and Vibration;
- Chapter 10: Landscape and Visual Amenity;
- Chapter 11: Archaeology and Cultural Heritage;
- Chapter 12: Material Assets including Traffic;
- Chapter 13: Risk Management;
- Chapter 14: Interactions;
- Chapter 15: Mitigation and Monitoring Measures.

4 POPULATION AND HUMAN HEALTH

4.1 Introduction

This chapter of the EIA Report considers the likely impacts of the Proposed Development on human beings, living, working, and visiting in the vicinity of the application site east of St. Paul's College, Sybil Hill, Raheny, Dublin 5 on lands which are zoned Z15. A small section of the site to the northeast, is zoned Z9, however no residential development is proposed on the lands contained within the application boundary which are zoned Z9. The Chapter details the likely direct and indirect effects of the Proposed Development on population and human health.

Human beings are one of the most significant elements of the environment to be considered, therefore any likely impact on the status of humans by a development proposal must be comprehensively addressed. One of the principal concerns in any Proposed Development is that the local population experiences no reduction in the quality of life as a result of the development on either a permanent or temporary basis. This chapter also examines the socio-economic impacts of the development proposal focusing on pertinent issues such as residential amenity, economic activity, tourism and population levels.

The section on Population and Human Health is broad ranging and covers the existence, wellbeing, and activities of people through the format of considering people as 'groups' or 'populations'. The assessment of impacts on human beings involves the identification of relevant key populations that may be affected by the Proposed Development and quantifiable documentary research.

Key populations have been identified as persons residing and engaging in activities near the application site, persons with a stake in the general economy of the local and regional area, and persons enjoying the recreational and cultural amenities of the area.

4.1.1 Quality Assurance and Competence

This Chapter was prepared by Louise Hewitt, Environmental Consultant, Enviroguide Consulting. Louise has a Master of Science (Hons) in Environmental Resource Management from University College Dublin and a Bachelor of Science (Hons) in Biology from Maynooth University. Louise has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Introduction Chapters, Population and Human Health Chapters and Archaeology and Cultural Heritage Chapters of EIARs. The chapter has been co-authored and reviewed by Janet O' Shea, Technical Director, Enviroguide Consulting. Janet has a Bachelor of Science in Environmental Health along with over 15 years' experience as an Environmental Professional including Environmental Impact Assessments.

4.2 Study Methodology

A desk-based study was undertaken to assess information regarding population, age structure, economic activity, employment, and unemployment within the vicinity of the Proposed Development.

The 2022 Census of Ireland was held on Sunday the 3rd of April 2022. The preliminary results were released on the 23rd of June 2022 however the main results will be published over several months starting in April 2023. The preliminary 2022 census results have been reviewed however they do not contain the required region-specific information for the purpose of this Social Infrastructure Report (Appendix B). As such, the more robust and complete 2016 census results have been used in this assessment (Accessed June 2022). The remaining information analysed as part of the desktop study was accessed in June 2022.

The scope of the evaluation is based on a review of data available from the Central Statistics Office (CSO), legislation, guidance documents and EIARs. The aim of the study was to assess the current baseline environment.

The likely impact of the Proposed Development on the local population is assessed in this EIAR in relation to:

- Population;
- Socio Economic impacts;
- Tourism and Amenity;
- Air quality;
- Water;
- Noise; and
- Traffic.

The Proposed Development is located within the Clontarf Local Electoral Area (LEA) which has been selected as the study area. This LEA is made up of 16 electoral divisions: Beaumont D, Beaumont E, Beaumont F, Clontarf East A, Clontarf East B, Clontarf East C, Clontarf East D, Clontarf East E, Clontarf West A, Clontarf West B, Clontarf West C, Clontarf West D, Clontarf West E, Drumcondra South A, Grace Park and Harmonstown B. A map of this area is detailed in Figure 4-1. As the electoral divisions are small areas, a representative sample of population from one electoral division would not be a representative sample of the age demography of the area.



Figure 4-1: Local Electoral Area Boundary (Source Local Electoral Area Boundary Committee No. 2)

4.2.1 Information Sources

The principal sources of information are as follows.

- Census and employment information published by the Central Statistics Office (CSO). Available at <https://data.cso.ie/#>
- The Dublin City Development Plan (2016-2022), Available at: <https://www.dublincity.ie/dublin-city-development-plan-2016-2022>
- The Draft Dublin City Development Plan (2022-2028), Available at: <https://www.dublincity.ie/sites/default/files/2021-12/volume-1-draft-dublin-city-development-plan-2022-2028-low-res.pdf>
- Regional Planning Guidelines of the Greater Dublin Area 2010-2022, and
- Ordinance Survey Ireland (OSI) mapping and aerial photography.

The EPA defines Sensitive Receptors such as residential receptors, schools, commercial premises, amenity areas and hospitals (Odour Emissions Guidance Note, September 2019). The Proposed Development includes 580 no. apartments which could be classed as residential receptors, a creche which could fall under the school category and a 100-bed nursing home which could fall under the hospital category. As all elements of the Proposed Development could be classed as sensitive receptors they have been assessed in this Chapter with the same sensitivity.

Baseline information relating to the existing community amenities have been assessed in the Social Infrastructure Report (Enviroguide Consulting, 2022) which has been submitted as a standalone document as part of this planning application (Appendix B). The following sources have been used to assess the community amenities:

- Google search including google maps
- Social Media Community Pages
- Failte Ireland
- Discover Ireland
- YourLocal.ie
- Dublin City Council – Raheny Library information

The Institute of Public Health in Ireland has issued a document “Health Impact Assessment Guidance” which details the link between human health and the built environment (Figure 4-2). This document also details the negative health impacts associated with unemployment. Unemployment affects both physical and mental health and is an important determinant of health inequalities in adults of working age. Unemployed people have a higher risk of lower levels of psychological wellbeing ranging from symptoms of depression and anxiety to self-harm and suicide. Unemployment can also impact other health determinants for example housing and nutrition. Based on this information, employment generated as a result of the Proposed Development has been assessed throughout this Chapter.

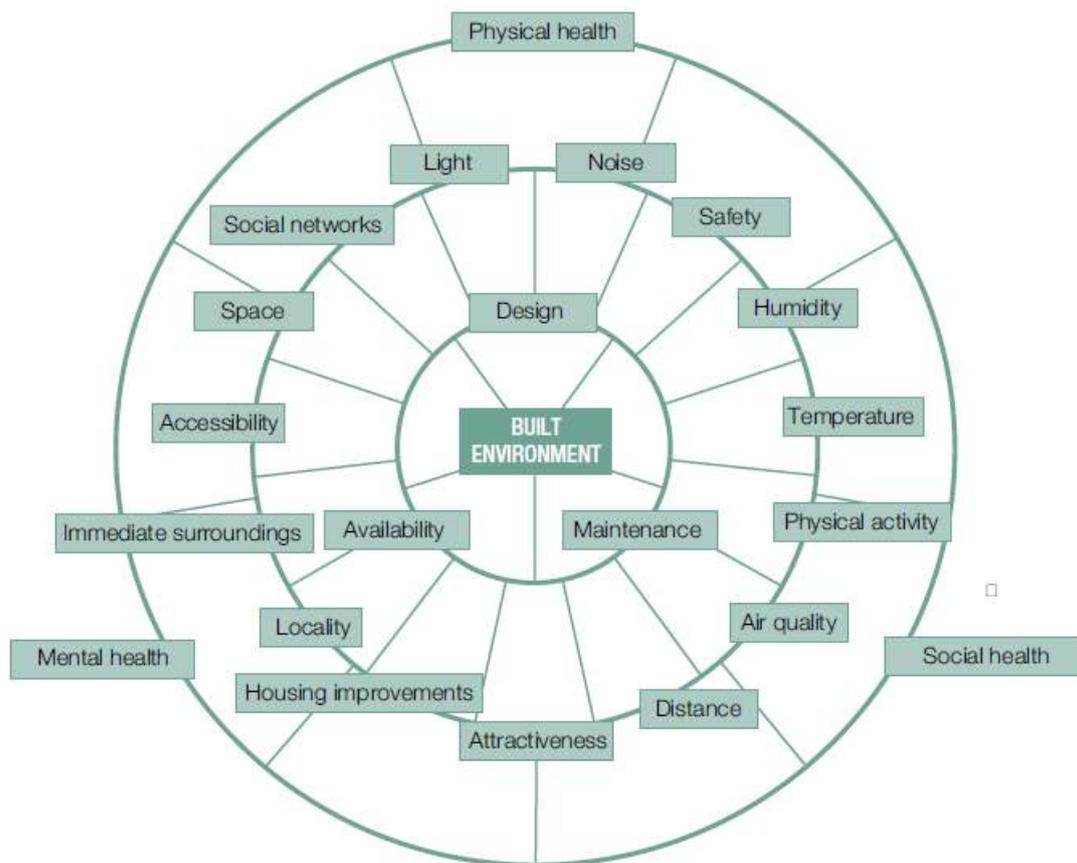


Figure 4-2: Health impact of the built environment

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the quality of effects. See Table 4-1.

Table 4-1: Definition of Quality of Effects

Quality	Definition
Positive Effects	A change which improves the quality of the environment
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

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the significance of impacts. See Table 4-2.

Table 4-2: Definition of Significance of Effects

Significance of Effects	Definition
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	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

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the duration and frequency of effects. See Table 4-3.

Table 4-3: Definition of Duration of Effects

Quality	Definition
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

4.3 The Existing and Receiving Environment (Baseline Situation)

The site of the Proposed Development is located adjacent to St. Paul's College secondary school located at Sybil Hill Road, Raheny, Dublin 5. It is within the administrative jurisdiction of Dublin City Council. Nearby areas include Killester, Clontarf, Artane, Kilbarrack, Coolock and Donaghmede, and Howth Head dominates the skyline.

The Proposed Development is in an area that can be characterised as a well-planned and settled mature residential area substantially developed in the 1940s and 1950s in the Raheny and Killester areas.

Raheny is bisected by the Howth Road (R105) and the R809 (coming from Bull Island, in turn Watermill Road, Main Street, Station Road) and is also accessed from the Malahide Road (R107), the coastal James Larkin Road (R807) and the R104 (including the Oscar Traynor Road and Kilbarrack Road).

The area is well serviced with public transport, including access to rail, buses, and established walking and cycling paths. Raheny, Harmonstown and Killester railway stations serve the DART suburban railway system and the Dublin-Belfast main line Raheny is also served by Dublin Bus (routes 29A, 31, 32, 31A and the rare 31d and 32x, and at night, 29N and 31N). There is also a local taxi rank.

The district, which is located in the Clontarf Local Electoral Area (LEA), within Dublin City Council, is home to two large municipal parks, St. Anne's Park and Bull Island with its 4.5km beach.

Directly across the road from St. Pauls is Sybil Hill Nursing Home, which houses the Provincial House of the Little Sisters of the Poor. This is a substantial nursing home in terms of its size

and a 5-storey building that faces onto the road frontage. A primary school occupies the northern part of that plot, accessed from Howth Road.

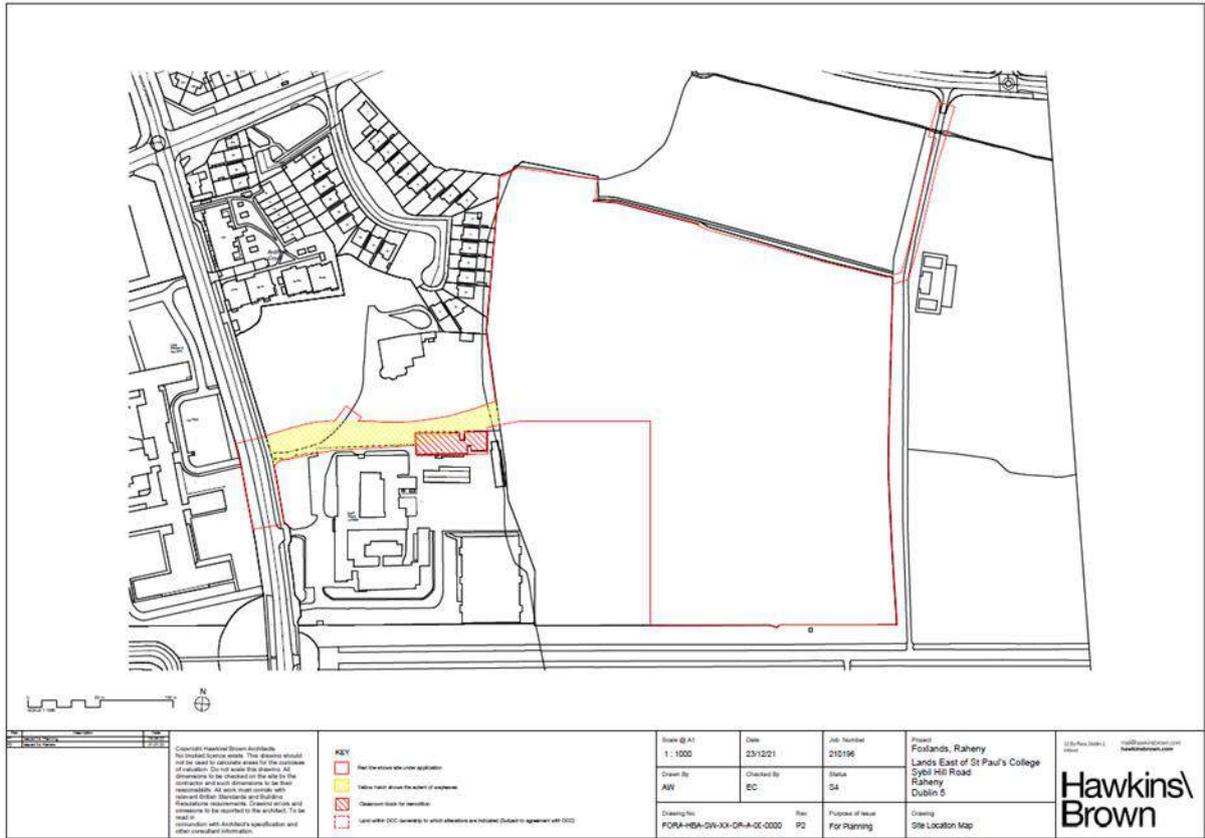


Figure 4-3 : Site Layout Map (Hawkins Brown, Drawing FORA-HBA-SW-XX-DR-A-00-0000)

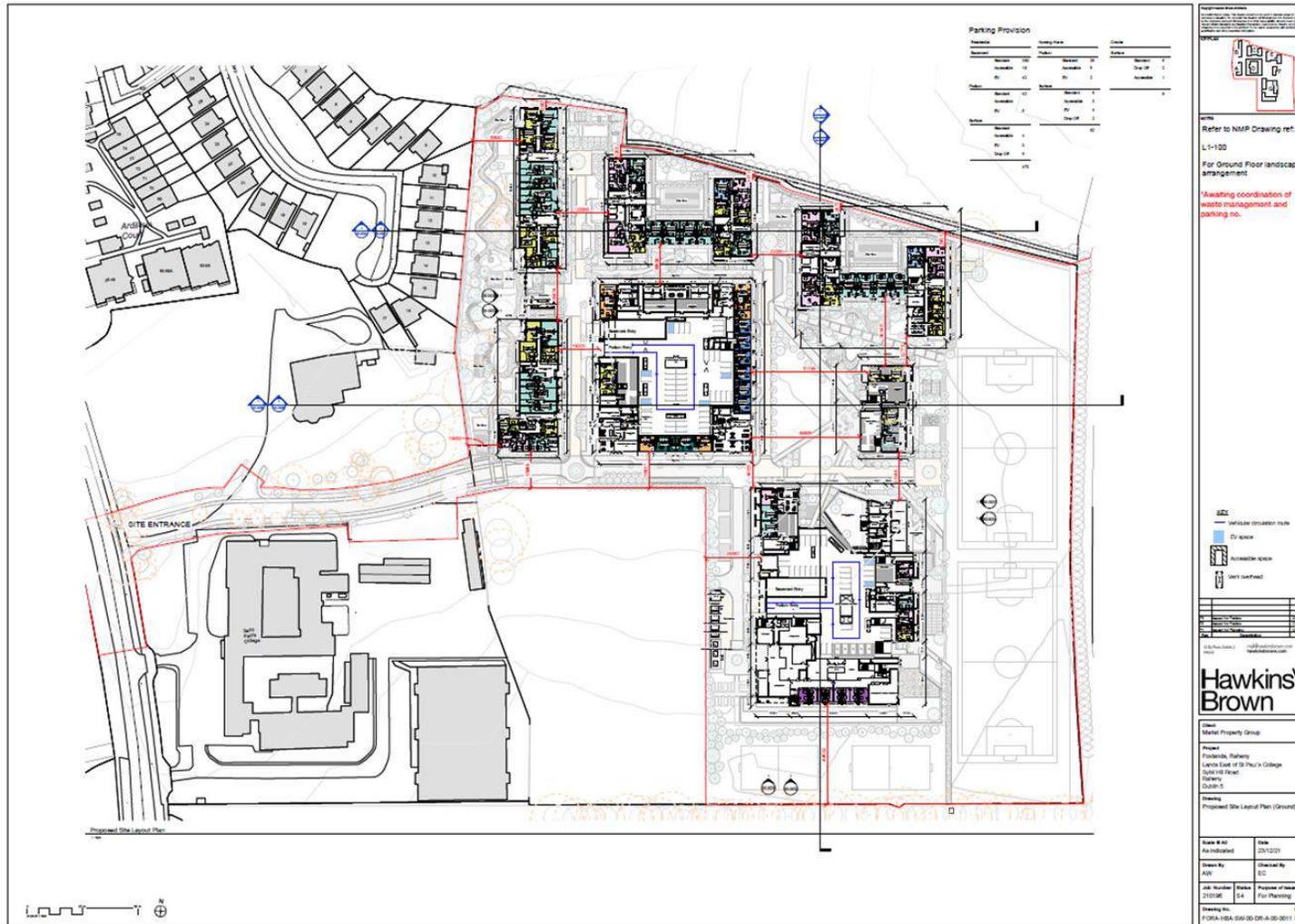


Figure 4-4: Proposed Development Layout (Ground Floor) (Hawkins Brown Drawing no. FORA-HBA-SW-00-DR-A-00-0011)

4.4 Characteristics of the Proposed Development

Raheny 3 Limited Partnership are applying for permission for development on lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5. The 6.7 ha site is bound to the north, east and south by St Anne's Park and to the west by residential development at The Meadows, Sybil Hill House (a Protected Structure) and St Paul's College. Vehicular access to the site is from Sybil Hill Road.

The Proposed Development consists of the construction of a residential and nursing home development set out in 7 no. blocks, ranging in height from 4-7 storeys to accommodate 580 no. apartments, residential tenant amenity spaces, a crèche and a 100-bed nursing home. The site will accommodate car parking spaces, bicycle parking spaces, storage, services and plant areas at both basement and podium level.

Landscaping will include extensive communal amenity areas, and a significant public open space provision on the east and south of the site. The proposed application includes all site landscaping works, green roofs, substations, boundary treatments, lighting, servicing, signage, surface water attenuation facilities and associated and ancillary works, including site development works and services above and below ground. For a full description of the Proposed Development please refer to the Statutory Notices.

4.4.1 Population and Demographic Analysis

In terms of the County, Region and the State, population structure and change are more strongly influenced by migration and emigration rates than by birth and death rates. The mid to late 1980s in Ireland was a period of heavy population outflow, mainly due to the poor economic and employment situation in the country at that time. The most recent population estimates (June 2022) published by the Central Statistics Office indicate that the combination of a net inward migration and high birth rates have resulted in the population of Ireland has exceeded 5 million for the first time since 1851. Population projections for Ireland up to 2046 anticipate a population of approximately five million under the most pessimistic scenario and over 6.7 million under the most optimistic scenario. Population projections for Northern Ireland up to 2034 anticipate a population of approximately two million.

The Greater Dublin Area (GDA) which includes Dublin City and County, showed a significant population growth of 18.7% between 2006 and 2016. Significant population pressures have been exerted on certain parts of the GDA, particularly those areas which are within close commuting distance of Dublin.

In the case of the GDA, population levels specified in the Greater Dublin Regional Planning Guidelines 2010 – 2022 are projected to be in excess of 2 million by the year 2022.

According to Census 2022, the total population of Dublin is 1,450,701 which represents a 7.7% increase from the value of 1,347,359 in 2016.

Table 4-4: Population Change in Greater Dublin Area, 2016 to 2022 Census (Source: CSO)

County	Population 2016 Census Data	Preliminary 2022 Census Data	Change in Number of Persons	Percentage change in Population
Dublin	1,347,359	1,450,701	103,342	7.7
Kildare	222,504	246,977	24,473	11.0
Meath	195,044	220,296	25,252	12.9
Wicklow	142,425	155,485	13,060	9.2
Total	1,907,332	2,073,459	166,127	40.8

4.4.2 Population and Age

The CSO data for 2016 records that there were 554,554 people in living in Dublin City, the council area where the Proposed Development is located. Table 4-5 shows the breakdown of the population of Dublin City based on their age range group during the 2016 Census against the Dublin City & Suburbs and State average. This table is further broken down into percentages of the population within these age ranges.

Table 4-5: City, City & Suburbs and National Population Categorisation by Age

Age Range	Dublin City		Dublin City & Suburbs		Ireland	
	No. of People	% of People	No. of People	% of People	No. of People	% of People
0-4 years	30,683	5.5	76,662	5.9	331,515	7
5-24 years	125,795	22.7	292,138	22.6	1,251,489	26.3
25-34 years	119,756	21.6	331,026	25.6	659,410	13.8
35-44 years	87,582	15.8	189,061	14.6	746,881	15.7
45-54 years	65,836	11.9	141,965	11.0	626,045	13.1
55-64 years	52,547	9.5	114,914	8.9	508,958	10.7
65-74 years	38,011	6.9	82,382	6.4	373,508	7.8
75 years and over	34,344	6.2	65,004	5.0	264,059	5.5
Total	554,554		1,293,152		4,761,865	

The study area has been defined in Section 4.2 of this Chapter as the Clontarf Local Electoral Area (LEA) (Figure 4-1).

An analysis of the CSO Census Statistics for 2011 and 2016 for the Clontarf LEA was completed and is shown in Table 4-6. This table breaks down the age profile of the area and details the percentages of population in each age bracket. The Table also shows data from 2011 as a comparison of population fluctuation in the area.

Table 4-6: Age Profile of the Clontarf Local Electoral Area

	0-4 years		5-12 years		13-18 years		19-24 years		25-44 years		45-64 years		65-69 years		70 years +	
	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016	2011	2016
Beaumont D	74	99	195	120	207	162	212	219	495	538	751	611	99	188	116	198
Beaumont E	117	128	140	167	112	95	179	156	505	524	455	417	168	128	325	436
Beaumont F	195	194	305	306	253	239	269	357	980	1,003	861	831	162	216	412	444
Clontarf East A	202	209	332	360	233	235	189	231	812	802	819	922	114	134	600	545
Clontarf East B	431	496	603	661	515	482	466	511	1,919	1,984	1,777	1,841	273	333	775	799
Clontarf East C	165	163	324	294	229	236	211	227	759	736	845	856	141	180	439	491
Clontarf East D	156	134	226	279	195	176	189	203	652	643	722	797	116	120	417	414
Clontarf East E	110	110	163	192	106	141	113	104	399	419	434	462	64	86	286	277
Clontarf West A	219	207	363	346	198	278	256	209	978	1,022	886	1,086	85	120	451	390
Clontarf West B	149	141	181	193	125	132	174	144	729	748	582	635	114	132	262	286
Clontarf West C	213	183	214	281	157	176	215	236	1,404	1,481	782	843	110	136	271	323
Clontarf West D	126	151	107	158	75	89	196	167	879	988	411	478	59	67	213	199
Clontarf West E	157	163	184	220	155	147	162	149	655	766	564	588	76	91	371	344
Drumcondra South A	255	253	289	294	232	212	486	537	1,865	2,135	960	1,542	132	247	352	402
Grace Park	263	276	466	471	454	393	549	526	1,512	1,622	1,542	1,454	247	342	637	722
Harmonstown B	151	192	276	263	184	222	221	190	754	784	656	742	64	79	378	286
Total No. of Persons	2,983	3,099	4,368	4,605	3,430	3,415	4,087	4,166	15,297	16,195	13,047	14,105	2,024	2,599	6,305	6,556
Total Percentage	5.8	5.7	8.5	8.4	6.7	6.2	7.9	7.6	29.7	29.6	25.3	25.8	3.9	4.7	12.2	12.0

Table 4-6 shows that the age range of population has remained relatively similar for the Clontarf LEA for all ages between the 2011 Census and 2016 Census, with a slight increase of population (1.2%) for people ages 65-69 years.

As evident from Tables 4-5 and 4-6, the population ranging between 25 and 44 years in the Clontarf LEA comprises 29.6% of the overall population of the area. This is comparable to the State average of 29.5%. Children ranging from 0-4 years in the Clontarf LEA comprise 5.7%, slightly lower than the State average of 7%. Young people ranging from 5-24 years make up 22.2% of the population of Clontarf LEA, lower than the national average of 26.4%.

The population ranging between 45 and 64 years in the Clontarf LEA comprises 25.8% of the population of the Clontarf LEA, higher than the national average of 23.8%.

The population in the Clontarf LEA aged 65 and over comprises 16.7% of the population of the area. The State average of people aged 70 and older is 13.3%.

4.4.3 Economic Activity & Employment

The labour force is defined as the number of people above the legal working age that are available to work. The labour force participation rate is the number of people who are employed and unemployed but looking for a job, divided by the total working-age population.

In 2016, there were 2,304,037 persons in the labour force in Ireland. This represented an increase of 71,834 (3.2%) on 2011 statistics. The substantial increase in retired persons (up 19.2% to 545,407) has impacted on the labour force participation rate, which fell to 61.4%.

Table 4-7 shows the percentage of the total population aged 15+ who were in the labour force during the 2016 Census. This figure is further broken down into the percentages that were at work or unemployed. It also shows the percentage of the total population aged 15+ who were not in the labour force, i.e. those who were students, retired, unable to work or performing home duties.

Table 4-7: Economic Status of the Population Aged 15+ in 2016 (Source: CSO)

Status		Ireland		Dublin City		Clontarf LEA	
% of population aged 15+ who are in the labour force		No. of People	% of People	No. of People	% of People	No. of People	% of People
% of which are:	Persons at work	2,006,641	53	265,293	56	25,720	56
	Unemployed looking for first regular job	31,434	1	4,686	1	279	0.6
	Unemployed having lost or given up previous job	265,962	7	34,514	7	1,889	4
% of population aged 15+ who are not in the labour force		No. of People	% of People	No. of People	% of People	No. of People	% of People
% of which are:	Student or pupil	427,128	11	53,067	11	5,223	11
	Looking after home/family	305,556	8	29,111	6	2,875	6
	Retired	545,407	15	63,637	14	8,144	19
	Unable to work due to permanent sickness or disability	158,348	4	18,665	4	1,392	3
	Others not in labour force	14,837	0	2368	1	175	0.4

When assessing the percentage of people in the labour force, it is noted that 56% of the population in Dublin City area and 56% of the population in the Clontarf LEA are in the labour force. This reflects the high number of people of a working profile living within the area. This figure is higher than the State average of 53%. The number of people unemployed having lost or given up their previous job or looking for first regular job is 4.6% on the Clontarf LEA, lower than the State average of 8%.

The most recent publication of monthly unemployment statistics was issued by the CSO in August 2022 for reference month July 2022. The monthly unemployment release contains a series of monthly unemployment rates and volumes. These series are based primarily on the Labour Force Survey and are compiled in accordance with agreed international practice. These statistics are the definitive measure of monthly unemployment. The Live Register is used to provide a monthly series of the numbers of people (with some exceptions) registering for Jobseekers Benefit or Jobseekers Allowance or for various other statutory entitlements at local offices of the Department of Social Protection.

Table 4-8 details the most recent information available from the CSO from August 2022 on the number of persons on the Live Register in Kilbarrack. Kilbarrack is the closest Social Welfare Office to the Proposed Development and provides services to all of Dublin 5 including Raheny. In July 2022, 1 person was on the Live Register in the Kilbarrack area.

Table 4-8: Number of Persons on Live Register, Kilbarrack (Source: CSO)

Month	December 2021	January 2022	February 2022	March 2022	April 2022	May 2022	June 2022	July 2022
Number of Persons on Live Register Kilbarrack	2083	2000	11	2	1	2	No Value	1

As with employment, the number of persons in the labour force is also influenced by changes in the size of the working age population (demographic effect). Up to the start of 2008 this demographic effect had been adding at least 30,000 to the labour force, Nationally, on an annual basis, primarily driven by net inward migration. With the decline in inward migration the positive demographic effect started to fall in the second half of 2007 and continued to decline throughout 2008 and 2009 before becoming negative in Q3 2009. The negative demographic effect continued for each quarter until Q1 2014. The demographic effect has been positive since Q2 2014 and in Q1 2019 a positive demographic effect contributed an increase of 36,000 to the overall change in the labour force.

Tables 4-9 and 4-10 show the level of education and the area of study of the Clontarf LEA population at the time of the 2016 Census.

Table 4-9: Level of Education Clontarf LEA (Source CSO)

Level of Education in Clontarf LEA	Total No. of People	Total Percentage
No formal education	358	0.9
Primary education	3285	8.6
Lower secondary	4064	10.6
Upper secondary	6259	16.4
Technical or vocational qualification	2441	6.4
Advanced certificate/Completed apprenticeship	1421	3.7
Higher certificate	1641	4.3
Ordinary bachelor's degree or national diploma	3211	8.4
Honours bachelor's degree, professional qualification, or both	6361	16.7
Postgraduate diploma or degree	6605	17.3
Doctorate (Ph.D.) or higher	751	2.0
Not stated	1779	4.7

Table 4-10: Area of Study Clontarf LEA (Source CSO)

Area of Study (Clontarf LEA)	Total No. of People	Total Percentage
Education and teacher training	1995	5.2
Arts	1335	3.5
Humanities	1304	3.4
Social sciences, business and law	8870	23.2
Science, mathematics and computing	2676	7.0
Engineering, manufacturing and construction	2798	7.3
Agriculture and veterinary	160	0.4
Health and welfare	2778	7.3
Services	1243	3.3
Other subjects	29	0.1
Not stated	14988	39.3

As detailed in Table 4-10 the main area of study stated in the Clontarf LEA is social science, business and law.

4.4.4 Travel & Commuting

The Clontarf LEA is made up of 16 electoral divisions.

In 2016 there were 17,758 students commuting to school or college from the area and 25,240 people commuting to work from the area. Tables 4-11 and 4-12 show the means of transport used.

Table 4-11 shows that the majority of students travel to school or college on foot (40.2%) with car passengers (20.7%), bus, minibus, coach (17.6%) and bicycle (11.3%) being the next popular means of transport to school and college from the area.

Table 4-11: Commuting Methods to School and College from Clontarf LEA

Means of Transport	No. of People (Clontarf LEA)	Percentage of People
On foot - School or college	7,146	40.2
Bicycle - School or college	2,003	11.3
Bus, minibus or coach - School or college	3,125	17.6
Train, DART or LUAS - School or college	812	4.6
Motorcycle or scooter - School or college	13	0.1
Car driver - School or college	500	2.8
Car passenger - School or college	3,683	20.7
Van - School or college	9	0.1
Other (incl. lorry) - School or college	2	0.0
Work mainly at or from home - School or college	17	0.1
Not stated - School or college	448	2.5
Total - School or college	17,758	

Table 4-12 shows that the majority of people travel to work by car (41.7% as a driver; 2% as a passenger). The other main means of transport are on foot (10.1%), bus, minibus or coach (16.6%) and bicycle (10.9%).

Table 4-12: Commuting to Work from Clontarf LEA

Means of Transport	Total Clontarf LEA	Percentage of People
On foot – Work	2,554	10.1
Bicycle – Work	2,755	10.9
Bus, minibus or coach – Work	4,192	16.6
Train, DART or LUAS – Work	2,419	9.6
Motorcycle or scooter – Work	203	0.8
Car driver – Work	10,519	41.7
Car passenger – Work	498	2.0
Van – Work	618	2.4
Other (incl. lorry) – Work	47	0.2
Work mainly at or from home – Work	706	2.8
Not stated – Work	729	2.9
Total – Work	25,240	

Table 4-13: Commuting Times for Clontarf LEA

Commute Times	Under 15 mins	1/4 hour - under 1/2 hour	1/2 hour - under 3/4 hour	3/4 hour - under 1 hour	1 hour - under 1 1/2 hours	1 1/2 hours and over	Not stated
Total Commuter Numbers (for those working outside of the home)	6,961	11,144	9,276	3,394	2,186	445	1,787
Percentage of Commuter (for those working outside of the home)	19.8	31.7	26.4	9.6	6.2	1.3	5.1

Demographic analysis of travel trends, as outlined in Table 4-13 within the Clontarf LEA indicate that the majority of people commute to the surrounding environs, and other employment centres in the immediate vicinity daily. Tables 4-11 and 4-12 shows that 35,193 people are commuting to work, school or college from the Clontarf LEA. According to the CSO, the average journey time of workers who commute from this area was between 15 minutes and 30 minutes. Table 4-13 shows that 51.5% of the population travel a distance of between 0 minutes and ½ hour, with a further 26.4% travelling between ½ hour and ¾ hour. The settlement's position is an important residential base for young people and families within the city environs.

4.4.5 Community & Amenities

The Proposed Development is located approximately 5km northeast of Dublin City Centre, which is a highly developed and concentrated area of residential, community and leisure receptors. Dublin City has a range of community facilities including parks / open spaces, sports / recreational, playgrounds, youth centres and libraries.

The most notable amenities in the direct vicinity of the Proposed Development are located within St. Anne's Park. The park is the second largest municipal park in Dublin. As well as extensive walks and green areas, the park contains numerous sporting facilities, including extensive GAA and soccer playing fields, tennis and golf. The park also contains non-sport amenities. Bisected by a small river, the park features an artificial pond and a number of follies, a large rose garden, a fine collection of trees with walks, a playground, cafe and recreational areas. The park also hosts markets on some weekends.

The Proposed Development is located 1.13km from North Bull Island at the area known as Dollymount. This island contains the amenity of Dollymount Strand as well as two golf courses. The island is also famous for its wildlife, and the lagoon and mudflats between the island and the mainland is a favourite location for birdwatching.

The Proposed Development is in close proximity to the seafront, with a promenade running continuously from Alfie Byrne Road to the wooden bridge at Dollymount. The seafront is highly popular with runners, walkers, sailors and cyclists.

Raheny has a strong network of community groups and clubs, which are voluntary groups. These local community groups include the Raheny Heritage Society, Tidy Village Group, Raheny Drama and Variety Group, Raheny Toastmasters, Raheny St. John Ambulance

Division, Raheny Order of Malta Unit, Raheny Community First Responders and some church-related groups, such as the local conference of the Society of St. Vincent de Paul.

With a strong sense of community in nearby Clontarf, there is a wide variety of community groups that are extremely active including Foroige Youth Club, Clontarf Hockey Club, Coast Road Runners, Clontarf Parish Tennis Club, St. Pauls Karate Club, Clontarf Junior Swimming Club, Metropolitan School of Dance and various Baby Toddler Playgroups.

The St. Anne's Residents' Association (SARA), with some allied bodies, operates a community hall on All Saints' Drive, while the Grange Woodbine Association has hall facilities on Station Road. Clontarf Residents' Association is located in Clontarf East.

Raheny and Clontarf have various girl guides and scout organisations. Raheny Scout Group, a unit of Scouting Ireland, meet at their den on the banks of the Santry River, opposite the Church of Our Lady Mother of Divine Grace on the Howth Road. Raheny Guides, also known as Buion An Leanbh Prague of the Catholic Guides of Ireland, have been in existence since 1966, meeting weekly. The Cygnets (age 5–7) meet in the CARA Hall and the Brigins (age 6–10), Guides (age 10–16) and Rangers (age 14–19) meet in Scoil Aine School Hall. Clontarf has a longstanding Clontarf Scout Troop, which was established in 1931. Clontarf also has two Boys' Brigade companies - the 12th, attached to Clontarf Church of Ireland, and the 39th, attached to the Presbyterian parish, and a Girls' Brigade company (5th Company Clontarf Presbyterian) attached to Clontarf & Scots Presbyterian Church.

The community library based in Raheny assists and facilitates several other groups in the area including conversation exchange group (where people can practice language skills with native speakers through conversation), creative writers' group, adult book club, film club, GIY (Grow it Yourself) Group, knitting circle and whist group. Children's activities include a children's book club, a children's creative writing group and a toddler group.

The library also provides useful facilities to the local residents, including free broadband and wireless internet service, self-service printing/scanning, photocopying, Microsoft Office suite available, study space, children's learning zone, garden, citizen's information centre, large print book collection, daily newspapers as well as application forms for motor tax, passport etc. and a community noticeboard / information. The nearby Marino Library also offers these services.

The Proposed Development includes a creche facility which will offer the Early Childhood Care and Education (ECCE) scheme. The ECCE programme is a universal two-year pre-school programme available to all children within the eligible age range. It provides children with their first formal experience of early learning prior to commencing primary school. The programme is provided for three hours per day, five days per week over 38 weeks per year and the programme year runs from September to June each year. Childcare services taking part in the ECCE programme must provide an appropriate pre-school educational programme which adheres to the principles of Síolta, the national framework for early years care and education. There is no charge to parents for the playschool or daycare hours provided under the ECCE scheme. The State capitation fee pays the playschool or daycare service to provide these ECCE hours (Department of Children, Equality, Disability, Integration and Youth, August 2022). The creche offers an opportunity for families in the Proposed Development and the surrounding area to avail of childcare services regardless of their financial status.

The Social Infrastructure Report (Enviroguide Consulting, 2022) has detailed the existing infrastructure and capacity of the area to support the Proposed Development. This includes an assessment of the existing infrastructure and the capacity of the surrounding area to support the Proposed Development (Appendix B).

4.4.6 Landscape and Visual

The main area of the site comprises open, relatively flat rough grassland field located to the north and east of the sportsground at St Paul's College. While the area appears relatively flat, there is a slight fall of around 4 metres from northwest to southeast. The western boundary of the main site area is enclosed in part by the sports grounds/floodlit pitch of St Paul's College, and in part by the eastern rear boundary wall of Sybil Hill House and in part by the rear boundary wall at 'The Meadows' estate.

While St Anne's Park lies to the north, east and south of the site, it is physically and visually separated from St Anne's Park by boundary fencing and dense tree planting. A short section of the northern boundary is defined by a high wall which is a possible remnant of a previous walled garden. To the north and east the boundary fence is backed by a belt of semi-mature planting located within St Anne's Park. The planting is dense and effectively screens out views between the site and the Park.

The southern boundary with St Anne's Park runs contiguous with part of the distinctive Holm Oak and Pine tree-lined Avenue. While views along the avenue are strongly focused and aligned along the avenue and its enclosure of mature trees, passing glimpsed views of the site are available under, and occasionally between, the canopies of the evergreen trees.

The boundary between St. Paul's College and Sybil Hill House is partly defined by a semi-mature line of cherry trees. A 'Ha-Ha' style feature in the lawn defines a more distinct boundary in the landscape, as do groups of mature trees to the south and west of Sybil Hill House.

A new recently completed residential apartment development 'Ardilaun Court' lies to the immediate north of Sybil Hill House and to the rear of residential properties on the west side of 'The Meadows'.

As noted, the main development site area comprises an open relatively flat rough grassland field. In the northwest of the site, a number of mature trees lie to the east / rear of 'The Meadows' estate. Some of the trees are in poor condition and are recommended for removal in the Tree Survey Report. Otherwise, there are no other mature trees within the main development area, however, the area is surrounded and enclosed to the north, east and south, by mature plantings/trees within St Anne's Park.

The significant regional amenity and conservation area of St Anne's Park encircles the site to the immediate north, east and south. The Park includes a distinctive tree-lined avenue located directly south of the site, as well as a variety of open spaces enclosed by mature tree belts and laid out to sports pitches. Some of the pitches are floodlit, and a new all-weather facility has been installed to the north of the Park. A Millennium Arboretum plantation is located immediately east of the site and north of the Avenue. The central core of the park, including

the Rose Garden, the Red Stables and the playground are all located circa 500m to the east of the site.

Residential estates, including All Saints Road, Howth Road, Furry Park, Vernon, and Mount Pleasant lie to the immediate north, west and south of St. Anne's Park / Sybil Hill Road. The prominent multi-storey nursing home / convent of the Little Sisters of the Poor is located immediately west of Sybil Hill Road.

4.4.7 Human Health

Health, as defined by the World Health Organization (WHO), is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". The Healthy Ireland Framework 2013-2025 defines health as 'everyone achieving his or her potential to enjoy complete physical, mental and social wellbeing. Healthy people contribute to the health and quality of the society in which they live, work and play'. This framework also states that health is much more than an absence of disease or disability, and that individual health, and the health of a country affects the quality of everyone's lived experience.

Health is an essential resource for everyday life, a public good and an asset for health and human development. A healthy population is a major asset for society and improving the health and wellbeing of the nation is a priority for Government. Healthy Ireland Framework 2013-2025 is a collective response to the challenges facing Ireland's future health and wellbeing.

Table 4-14: Health Status of Clontarf LEA

Health Status of Clontarf LEA	Very good	Good	Fair	Bad	Very bad	Not stated
Total Number of People	33,651	14,123	4,375	724	164	1,391
Total Percentage of People	61.8	25.9	8.0	1.3	0.3	2.6

Table 4-14 shows that the majority of people in Clontarf LEA (87.8%) have self-identified themselves in the 2016 Census as having 'very good health' or 'good health'.

4.4.8 Social Health

According to the World Health Organisation, poor social and economic circumstances affect health throughout life. Good health involves reducing levels of educational failure, reducing insecurity and unemployment, and improving housing standards.

Health is influenced, either positively or negatively, by a variety of factors. Some of these factors are genetic or biological and are relatively fixed. 'Social determinants of health' arise from the social and economic conditions in which people live. They are not so fixed such as type of housing and environments, access to health or education services, incomes generated and the type of work people do, can all influence a person's health, and the lifestyle decisions people make.

A range of factors have been identified as social determinants of health, these generally include the wider socio-economic context, inequality, poverty, social exclusion, socio-economic position, income, public policies, health services, employment, education, housing, transport, the built environment, health behaviours or lifestyles, social and community support networks and stress.

People who are less well off or who belong to socially excluded groups tend to fare badly in relation to these social determinants. Being at work on the other hand provides not only an income, but also access to social networks, a sense of identity and opportunities for development or progression.

Figure 4-5 presents the social determinants of health adapted from Dalghren and Whitehead (1991) and Grant and Barton (2006) as presented in Healthy Ireland.

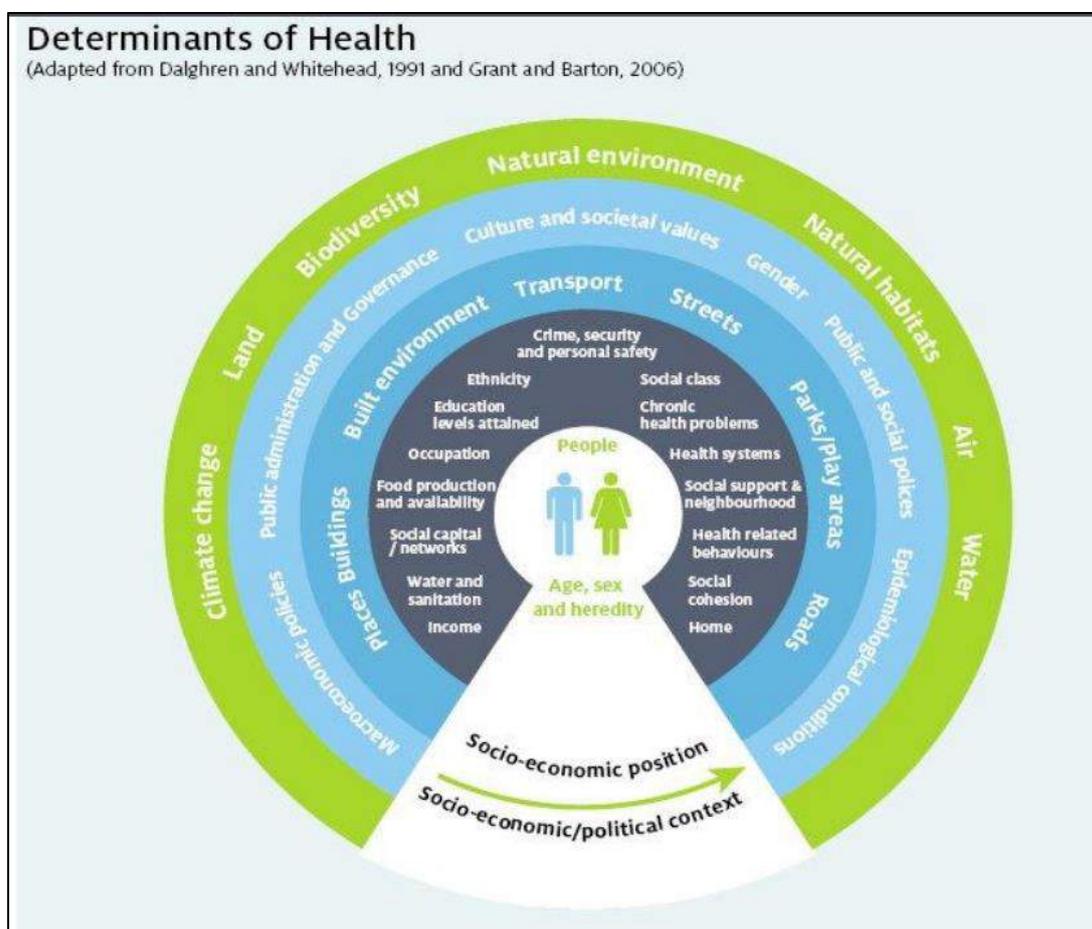


Figure 4-5: Social Determinants of Health (Healthy Ireland, DOH 2013)

Section 4.4.3 of this Chapter states 56% of the population in the Clontarf LEA are in the labour force. This reflects the high number of people of a working profile living within the area. The percentage of people working (employer or own account worker and employee) is 56.6% for the Clontarf LEA, which is marginally higher than the percentage for the State of 53.3%.

As detailed in Table 4-14, the majority of people in the Clontarf LEA (87.8%) have self-identified themselves in the 2016 Census as having 'good health' or 'very good health'. The

high employment levels, coupled with the self-identification of health status in Clontarf LEA, indicating that positive social health conditions exist.

4.5 Potential Impact of the Proposed Development

The population in the vicinity of the Site of the Proposed Development has been assessed in terms of demography, economic activity and employment, tourism and amenity, landscape and visual, human health and social health.

'Environmental factors play a central role in human development, health and disease. Broadly defined, the environment, including infectious agents, is one of three primary factors that affect human health. The other two are genetic factors and personal behaviour. As the impact of the environment on human health is so great, protecting the environment has long been a mainstay of public health practice. National and local efforts to ensure clean air and safe supplies of food and water, to manage sewage and municipal wastes, and to control or eliminate vector-borne illnesses have contributed a great deal to improvements in public health' (Centre for Environmental Research, 2010). The Proposed Development will manage municipal wastes in an environmentally sound manner, thus resulting in a positive effect on the health of the community.

The Proposed Development has the potential to provide employment opportunities and health improvements. Employment and income are among the most significant determinants of long-term health, influencing a range of factors including the quality of housing, education, diet, lifestyle, coping skills, access to services and social networks.

The Proposed Development will result in a significant number of new jobs being created. It is proposed that approximately 24 jobs will be created in the creche facility, 1-2 permanent apartment building management jobs, and 110 jobs in the nursing home facility during the Operational Phase of this development having both a direct and indirect positive impact on the local economy and employment.

The Proposed Development will also create additional indirect employment, for example at shops, cafes, fuel stations etc, in the vicinity of the Proposed Development. The Proposed Development will have a slight positive long-term effect in terms of additional direct and indirect employment and on the local socio-economic environment.

4.5.1 Construction Phase

The Proposed Development has the potential to cause additional traffic, noise, dust, and visual impacts. Each of these impacts have been assessed in full in the respective chapters of this EIAR and in the following subsections. The expected duration of the construction phase is 18 months.

4.5.1.1 Human Health

The Proposed Development has the potential to provide health improvements due to the creation of additional employment. Employment and income are among the most significant determinants of long-term social health. This will be a positive impact due to the creation of direct and indirect employment during the construction phase. It is anticipated that up to 300

no. construction personnel will be employed either directly or indirectly during the Construction Phase which is anticipated to extend over a period of 18 months.

4.5.1.2 Socio-economic

The Proposed Development will allow for the creation of direct employment. There will be approximately 300 workers directly employed during the Construction Phase of the project. The Proposed Development will also create additional indirect employment for suppliers, drivers delivering supplies to and from the Site and workers on the Site utilising local shops and other businesses in the surrounding areas which will benefit the local economy. Therefore, the Proposed Development will have a slight positive impact in terms of additional direct and indirect employment and on the local socio-economic environment and will be short-term in duration.

4.5.1.3 Traffic

There is potential for construction traffic to impact the surrounding population and human health from a noise and dust perspective in relation to the surrounding road network. Deliveries to and from the site by heavy good vehicles will impact on noise levels, whilst dust may result from vehicles travelling along gravel roads and from general earthwork activities. The number of construction related vehicle movements have been detailed in the Preliminary Construction, & Demolition Waste Management Plan. The Preliminary CDWMP and CEMP has detailed mitigation measures to ensure there are no significant impacts as a result of construction vehicles.

4.5.1.4 Air Quality and Climate

Nuisance dust emissions from construction activities, including traffic, are a common and well recognised problem which can negatively impact air quality. Fine particles from these sources are recognised as a potential significant cause of pollution and can be damaging to the health of the surrounding population during the Construction Phase.

According to the Health Service Executive (HSE), the health effects associated with the main pollutants of concern are:

- Nitrogen Dioxide, Sulphur Dioxide, Ozone - Irritate the airways of the lungs, increasing the symptoms of those suffering from lung diseases.
- Particles (PM10, PM2.5) - Can be carried deep into the lungs where they can cause inflammation and a worsening of heart and lung diseases.
- Carbon Monoxide - Prevents the uptake of oxygen by the blood and poses a greater risk to those suffering from heart disease.

Chapter 8 of this EIAR has concluded that there will be no significant impacts on air quality as a result of the Proposed Development and as such there will be no significant impact on human health.

4.5.1.5 Noise and Vibrations

Noise generating activities associated with the Construction Phase have been identified in Chapter 9 Noise and Vibrations of this EIAR. During the Construction Phase all operations will

comply with the BS5228:2009 "Noise and Vibration Control on Construction and Open Sites". The noise-generating activities associated with the Site are as follows:

- Site clearance, including demolition works of the prefab building within the grounds;
- Building construction works;
- Trucks entering and exiting the Site.

Noise exposure can cause a variety of human health effects including annoyance, sleep disturbance, raised stress levels, work impacts for commercial receptors or individuals who work from home.

The Construction Phase is intended to be an 18–24-month programme. The operational hours for the site will be 08:00 to 17:00 Mondays to Fridays and 08:00 to 14:00 Saturdays. No work is permitted on Sundays or public holidays. Deviation from these hours will only be allowed in exceptional circumstance with prior written approval from the planning authority.

When assessing noise and population and human health, particular consideration has been given to residential properties or noise sensitive receptors such as schools, hospitals, nursing homes and recreational spaces within close proximity to the Proposed Development. Three noise sensitive locations (NSLs) have been identified in relation to the Proposed Development Site. The boundary of the closest NSL to the proposed construction activities is located at 40m from the activities and the closest NSL to the proposed demolition activities is located at 20m from the activities. Chapter 9 of this EIAR has determined there will be no significant noise impacts and that construction activities will not exceed any outlined thresholds. As such, there will be no significant impacts on human health as a result of noise.

Amplitude Acoustics have been engaged as Acoustic Consultants for the Proposed Development. As part of the post planning pre-construction acoustic design, Amplitude Acoustics will be undertaking site measurements, an inward noise impact assessment, operational noise assessment and construction noise and vibration assessment. A letter of confirmation is provided by Amplitude Acoustics and can be found in Appendix C. A request for further information (FI) is expected. The assessments detailed above will be conducted once an FI is issued.

4.5.1.6 Hydrology

During the Construction Phase there is potential for demolition and excavation works to impact ground water and surface water quality. Pollution of water bodies and ground water can occur from accidental spills of fuel or chemicals used during construction. Mismanaged construction waste can also enter water bodies if not disposed of or stored correctly. Any water quality impacts can negatively impact the human health of residents of the Proposed Development and surrounding dwellings. Chapter 7 of this EIAR has concluded there will be no significant impact on the receiving groundwater and surface water environment. This will ensure there will not be a significant impact on population and human health as a result of the Construction Phase of the Proposed Development.

4.5.1.7 Landscape and Visual Impact

The landscape and visual amenity of an area can affect the emotional and physiological health of those within it. During the Construction Phase, the Site landscape will undergo a change

which will have a visual impact. This will potentially impact the visual amenity of the nearby visual receptors which include residential dwellings, St. Pauls School and St Anne's Park.

The significance of the landscape impact is considered to be moderate and will last for the duration of the construction phase (18-24 months). Site hoardings will be erected to screen early-stage ground works and ground-based activity and reduce the impact on nearby receptors. As there will be no significant impact on the Landscape and Visual amenity there will be no associated impact on human health.

4.5.1.8 Community Amenities

The Construction Phase will involve deliveries and movement of vehicles and workers to and from site. As St Annes Park, an important local amenity in the community, is located to the north, east and south of the site there is potential for these activities to impact the human health of those using the park. The Proposed Development is physically and visually separated from St Anne's Park by boundary fencing and dense tree planting. Connectivity and permeability are a key design objective for the development masterplan and one entry point is proposed to the east of the site to St Anne's Park. This provides a direct route to the proposed public amenity space as well as promoting connectivity to the residential development.

As per the CDWMP, all deliveries to the construction site will be made to the sole site access from Sybil Hill Road. It has been predicted that there will be approximately 10 arrivals and departures per day to and from the application site. Based on this construction route it is not expected that there will be a significant impact to any of the entrances to St. Anne's Park.

4.5.2 Operational Phase

4.5.2.1 Population & Demographic Settlement Patterns

The changing demographic profile with additional people moving into the locality post completion of the development will ensure many community facilities remain sustainable rather than add additional pressure on them. After completion of the Proposed Development, the changing demographic profile is likely to ensure a balanced age profile within the local area. The Proposed Development will be imperceptible in significance in terms of changing age profile and long-term in duration.

4.5.2.2 Human Health

The Proposed Development has the potential to provide health improvements due to the creation of additional employment. Employment and income are among the most significant determinants of long-term health. This will be a positive impact due to the creation of approximately 135 jobs in total during the operational phase from direct employment. Additional indirect employment will be created as a result of the Proposed Development.

Nursing home, childcare and school facilities have been assessed in the Social Infrastructure Report (Appendix B). This report concluded that there are several childcare and nursing home facilities, primary schools, secondary schools and third level institutions in the area that can accommodate the future residents of the Proposed Development.

The Proposed Development may result in the spread of COVID-19 if social distancing and hygiene measures are not adhered to at the facility during the operational phase. There will be approximately 135 workers employed during the operational stage in the proposed nursing home & creche facilities. During the operational phase of the Proposed Development, it is expected that HSE guidelines will be adhered to in relation to social distancing, cough and sneeze etiquette, face masks and hand washing. Appropriate welfare facilities will be provided.

It is expected that all workers employed during the operational phase of the Proposed Development will comply with the relevant HSE guidelines and any Government protocols that will be in place at that point in time in relation to Covid-19. If all COVID-19 safety protocols and hygiene measures are adhered to it is considered that the Proposed Development poses no additional COVID-19 risk.

4.5.2.3 Socio-Economic

The Proposed Development will allow for the creation of new employment. It is proposed that approximately 135 people directly employed during the operational phase having a positive impact, both directly and indirectly to the local economy and employment.

The Proposed Development has the potential to increase the level of direct and indirect employment associated with the operation of the nursing home, creche and property management services. The development will have economic benefits such as positive effects in terms of generating economic activity with spin-off economic activity created for local retail and service providers.

This will have a positive, moderate, long term socio-economic effect.

4.5.2.4 Landscape & Visual Effects

The potential landscape and visual effects of the Proposed Development are fully assessed in Chapter 10 of this EIA Report. The site will be transformed from a relatively flat greenfield site to a site containing 7 no. blocks of residential dwellings, creche and nursing home that mostly range in height from 4 to 7 storeys. The Landscape and Visual Chapter has concluded that the Proposed Development is compatible with the existing townscape and character. Mitigation measures have been included in the form of the design of the Proposed Development during the operational phase, particularly the landscape design, which will help to assimilate the built elements of the development and complement the parkland character of the surroundings. Overall, the Proposed Development will not result in any significant landscape / townscape or visual impacts.

4.5.2.5 Noise

Noise exposure can cause a variety of human health effects including annoyance, sleep disturbance, raised stress levels, work impacts for commercial receptors or individuals who work from home.

There will be an increase in the population of the surrounding area as a result of the Proposed Development which has the potential to increase traffic volumes, and subsequently traffic related noise, on the local road network. No traffic routes are predicted to experience

increases of more than 25% in total traffic flows during the Operational Phase and therefore no detailed assessment is required as per the DMRB Guidelines. Refer to Chapter 12 of the EIAR for a detailed traffic assessment report.

The impact of noise from operational traffic will be unnoticeable and will not have a negative impact.

Amplitude Acoustics have been engaged as Acoustic Consultants for the Proposed Development. As part of the post planning pre-construction acoustic design, Amplitude Acoustics will be undertaking site measurements, an inward noise impact assessment, operational noise assessment and construction noise and vibration assessment. A letter of confirmation is provided by Amplitude Acoustics and can be found in Appendix C. A request for further information (FI) is expected. The assessments detailed above will be conducted once an FI is issued.

4.5.2.6 Traffic and Transport

Insufficient physical activity has been identified by the World Health Organisation as risk factor for global mortality. The provision of linkages to public transport and adequate pedestrian and cyclist facilities as part of the Proposed Development, will result in a positive effect on sustainable transport modes and will have a slight positive impact on the human health of the future residents.

Increased population as a result of the Proposed Development has the potential to increase traffic congestion on the surrounding road network thus negatively impacting the human health of road users in both private vehicles and public transport. A full assessment of traffic and transport effects are presented in Chapter 12.1 of this EIA Report. The traffic assessment concludes that whilst the surrounding road network can cater for the Proposed Development, the increase in traffic over the baseline condition will result in a moderate impact on the surrounding roads network. As such, there will be no significant impact on population and human health as a result of traffic.

The Social Infrastructure Report (Appendix B) (Enviroguide Consulting, 2022) has assessed the existing public transport facilities in the surrounding area in terms of bus, rail, pedestrian facilities and cycling facilities. The analysis of the existing infrastructure capacity in this Social Infrastructure Report deems the Social Infrastructure of the area to be suitable to accommodate the characteristics of the Proposed Development.

4.5.2.7 Community Amenities

The Site is currently not accessible to or being utilised by the public. Upon completion, the Proposed Development represents the provision of additional amenities in the area; the creche and nursing home are to be used both by future residents and the wider community. Community amenities have been detailed in the Social Infrastructure Report submitted as a standalone document as part of this planning application (Enviroguide Consulting, 2022) (included in Appendix B). This report concluded that there is sufficient capacity for the surrounding area to support the Proposed Development both in terms of community amenities and other social infrastructure. The increased population as a result of the Proposed Development will sustain the existing community facilities such as sports clubs and other recreational facilities.

The Proposed Development includes pedestrian and cycle-friendly access to St. Anne's Park to the north-east and south-east of the Proposed Development to ensure connectivity to the park for the future residents (Design Statement, Hawkins Brown, 2022).

Based on the findings of the Social Infrastructure Report, there will be no significant impact on the surrounding community amenities as a result of the Proposed Development and there is sufficient capacity for the surrounding area to support the Proposed Development. This has been assessed in the Social Infrastructure Report under the following headings: Education, Childcare, Nursing Home Facilities, Sport, Recreation and Open Space, Public Safety, Art and Culture, Religious and Faith Institutions, Retail, Community Support and Amenities. There are sufficient retail facilities such as supermarkets, food stores, convenience stores in the area that can accommodate the future residents of the Proposed Development (Appendix B).

4.5.3 Potential Cumulative Impacts

Cumulative Impacts can be defined as "impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project". Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the cumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

The cumulative effects of the Proposed Development on the Population and Human Health have been assessed taking other planned, existing, and permitted developments in the surrounding area into account. Table 4-15 details the planning applications in the surrounding area.

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment
2857/18 Decision: Grant Permission. Decision Date: 19/12/2018	MKN Developments Limited	Amendments to the permitted development (Reg. Ref. 4242/15; ABP Ref. PL29N.246250 and as amended by Reg. Ref. 2977/17, ABP Ref. PL29N.249043) at this 0.53 hectare site at Sybil Hill Road, Raheny Dublin 5. The site is bounded by St. Pauls School to the south, Sybil Hill Road to the west, The Meadows residential development to the east and north and the Kare Social Services Centre to the north. The site formerly incorporated No. 1, 1A and 1B Sybil Hill Road (and lands to the rear of same). The proposed amendments consist of: - The provision of an additional penthouse unit to Block A at 5th floor level and the extension of the 4th floor level to provide for 2 no. additional units (1 no. 3 bed unit and 1 no. 4 bed unit) to Block A increasing the unit number from 49 no. to 51 no. in Block A and from 76 no. to 78 no. overall (71 no. apartments and 7 no. houses); - The proposed additional units will result in a part increase in height of Block A at the southwestern corner fronting Sybil Hill Road from 16.1m to 19.25m; - The proposed extension to the 4th floor level to provide for 1 no. 3 bed units will be set back c. 5.6m from the western boundary along Sybil Hill Road with the penthouse unit at the new 5th floor	The Planning Authority (DCC) granted permission for the development subject to 11 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, traffic management and waste management. Specific conditions have been set by the Drainage Division regarding surface and foul water sewers and SuDS measures, which must be strictly adhered to. Therefore, there are no cumulative impacts anticipated with this development.

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment
		<p>level being set back c.2.5m from the western boundary with Sybil Hill Road.</p> <ul style="list-style-type: none"> - Amendments to communal open space at 4th floor level to accommodate the additional residential units; - Minor elevational changes to Block A including the provision of private roof terraces at 4th and 5th floor level; - SUDs drainage and all ancillary and associated site development and landscaping works. 	
<p>3167/19 Decision: Grant Permission. Decision Date: 09/09/2019</p>	<p>Sean Carroll Garages Ltd.</p>	<p>Planning permission for development approved under Dublin City Council Reg. Ref. 4353/16 at the existing petrol filling station consisting of revisions to existing shop and forecourt including:</p> <ul style="list-style-type: none"> (i) Change of use and internal alterations to ground floor to provide additional retail floorspace of 8 sq.m and ancillary facility for sales of hot food for consumption off the premises, (ii) New ground floor window and pay hatch to front elevation, (iii) Revisions to car parking layout, and (iv) all associated site, drainage and boundary development works. 	<p>The Planning Authority (DCC) granted permission for the development subject to 8 no. condition(s). The conditions relate to the sale of hot food, visual amenity, noise control, and traffic safety.</p> <p>Therefore, there are no cumulative impacts anticipated with this development.</p>
<p>3047/21 Decision: Grant Permission. Decision Date: 01 Oct 2021</p>	<p>The Board of Management of Greenlanes National School</p>	<p>Planning permission for the construction of a single storey extension to the rear of the existing school at the northwestern side of the site and including all associated site works.</p>	<p>The Planning Authority (DCC) granted permission for the development subject to 8 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, transport and parking. Conditions have been set by the Drainage Division regarding surface and foul water sewers and SuDS measures, which must be strictly adhered to. Therefore, there are no cumulative impacts anticipated with this development.</p>
<p>2998/20 Decision: Grant Permission. Decision Date: 19 Oct 2020</p>	<p>St. Paul's College, Raheny</p>	<p>The development will consist of the following: construction of (i) a pergola structure consisting of a timber frame with retractable awning system above; (ii) sand and cement rendered block walls (0.8 m in height) with precast concrete capping to surround the proposed pergola structure; (iii) raised planted bedding along the block walls; and (iv) all site works necessary to facilitate the development. The proposed structure is located within the internal courtyard area at St. Paul's College.</p>	<p>The Planning Authority (DCC) granted permission for the development subject to 6 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, transport and drainage. Therefore, there are no</p>

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment
			cumulative impacts anticipated with this development.
<p>3803/21 Decision: Grant Permission. Decision Date: 17 Feb 2022</p>	<p>The Society of Jesus</p>	<p>PROTECTED STRUCTURE: Permission for development at this site, which contains a Protected Structure known as Manresa House. The proposed development will consist of: 1) a new single storey, flat-roofed building located to the northeast of the protected structure, to provide for new reception, dining, cooking and associated ancillary spaces, with roof lights, solar panels and part sedum roof; 2) a new single-storey, flat-roofed open loggia structure forming a covered route from the existing Retreat Building to the proposed new building; 3) associated hard landscaping, including new terrace and external steps, 2no. disabled parking bays, and extensive planting works to the courtyard; 4) landscaping works, including the provision of 36 no. car-parking spaces, new planting to the west lawn and the formation of a new stormwater attenuation pond: and 5) the removal of an existing single-storey, pitched roof timber structure.</p>	<p>The Planning Authority (DCC) granted permission for the development subject to 12 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, surface water drainage and SuDS, transport, parking and maintaining the integrity of the protected structure. Therefore, there are no cumulative impacts anticipated with this development.</p>
<p>2038/18 Decision: Grant Permission. Decision Date: 08 Jan 2019</p>	<p>MKN Property Group</p>	<p>PROTECTED STRUCTURE: Permission for a residential development of 72 no. units across 4 no. blocks with a single level basement, consisting of the change of use of the existing Verville Retreat building from nursing home use to residential use and the change of use of the existing former outbuilding to residential use. The overall development will comprise of the following: Block A: construction of a 4-storey building (3 storeys with a setback fourth storey) comprising 14 no. apartments (12 no. 2 bedroom units and 2 no. 3 bedroom units) with balconies/terraces to the north and south elevations; Block B: The change of use of the existing 4 storey Verville Retreat building from nursing home use to residential use comprising 9 no. apartments (3 no. 1 bedroom units and 6 no. 2 bedroom units). Demolition of later additions and extensions to the existing Verville Retreat building as well as associated modifications to elevations and internal modifications/reconfiguration of the refurbishments to the existing building in order to accommodate the provision of the new apartment units and the construction of a new external stair core at the buildings eastern elevation; Block C: Construction of a 4 storey building (3 storeys with a setback fourth storey) comprising 48 no. apartments (1 no. studio apartment, 20 no. 1 bedroom units, 21 no. 2 bedroom apartments and 6 no. 3 bedroom apartments) with balconies/terraces to all elevations and roof garden; Block D: The conversion of the existing single storey outbuilding into 1 no. single storey, 2 bedroom mews dwelling with associated internal and external modifications to accommodate the proposed change of use; A</p>	<p>The Planning Authority (DCC) granted Retention Permission under planning ref. no. 3081/20 on 28 Oct 2020. The development is subject to the conditions of the original planning grant, with additional conditions relating to drainage. Therefore, there are no cumulative impacts anticipated with this development.</p>

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment
		basement level comprising a total of 69 no car parking spaces, 80 no. bicycle parking spaces, ancillary plant room and refuse storage areas; Revisions and improvements to the existing vehicular entrance to Vernon Avenue; Demolition of the existing single storey block to the north of Verville Retreat; landscaping (including communal and private open space); Boundary treatment; and, all associated engineering and site development works necessary to facilitate the development.	
4656/18 Decision: Grant Permission. Decision Date: 27 Mar 2019	Clontarf Hospital	Permission for development at Castle Avenue, Clontarf, Dublin 3. The development will consist of the removal of the existing maintenance portacabins and demolition of the existing hard standing area, removal of 4 young trees which will be replaced in the area to suit the development, removal of 3 car spaces and the construction of a single storey maintenance building including, workshop, office, store and bin store and associated site works adjacent to the existing services yard.	The Planning Authority (DCC) granted permission for the development subject to 12 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, surface water drainage and SuDS, public infrastructure, public health and safety, amenity, ecology and sustainable development. Therefore, there are no cumulative impacts anticipated with this development.

4.5.4 “Do Nothing” Impact

A do-nothing scenario would result in the subject lands remaining as greenfield lands. If the development were not to proceed there would be no immediate impact on the existing population, or economic activity for residents living in the area. However, due to the size of the Proposed Development site in relation to other areas of land zoned for residential development in the environs, it is considered that the housing targets for the settlement set out in the City Development Plan could not be achieved.

If the lands were to remain as greenfield lands, this would be an under-utilisation of zoned and serviceable urban lands from a sustainable planning and development perspective, particularly considering the location of the lands. A do-nothing scenario would result in a continual decline of the population of the area. A failure to deliver the Proposed Development would result in a growing need for additional residential units within the Dublin Metropolitan Area not being met, with implications for use of greenfield lands more remote from the city centre and from established services in the transport, education, social and commercial sectors.

4.6 Avoidance, Remedial & Mitigation Measures

4.6.1 Construction Phase

No specific mitigation measures are required during the Construction Phase of the Proposed Development in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, mitigation measures in relation to air emissions (dust), noise, traffic, waste etc. are identified in their respective chapters in this EIA Report.

4.6.2 Operational Phase

No specific mitigation measures are required during the Operational Phase of the Proposed Development in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, mitigation measures in relation to air emissions, noise, traffic, waste etc. are identified in their respective chapters in this EIA Report.

4.6.3 “Worst Case” Scenario

Not applicable.

4.7 Residual Impacts

The Proposed Development will bring a new population into the area. This new population will support existing schools, shops, public transport and the local community. Additional facilities will be provided in the area including the creche and nursing home facility. It is considered that there will be a slight positive impact on the population and human health. No specific mitigation measures have been proposed for population and human health so residual impacts will be slight positive.

No long term, adverse effects are envisaged to arise.

4.8 Monitoring

4.8.1 Construction Phase

No specific monitoring measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, monitoring in relation to noise and traffic are identified in their respective chapters in this EIA Report.

4.8.2 Operational Phase

No specific monitoring measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, monitoring in relation to noise and traffic are identified in their respective Chapters in this EIA Report.

4.9 Interactions

4.9.1 Noise

Construction activities such as site clearance, building construction works, and trucks and vehicles entering and exiting the Site have the potential to interact with the surrounding

population and human health and cause noise disturbance. The impact assessment of noise and vibration has concluded that additional noise associated with the construction and operational phase will not cause a significant impact. The operation of on-site machinery will be intermittent and last only for the duration of the Construction Phase. As such, there will be no significant impact on population and human health. The operational noise and vibration impact is not significant with a neutral effect. Noise is fully assessed in Chapter 9 of this EIAR.

4.9.2 Air

Interactions with air quality during the construction and operational phase has the potential to cause dust nuisance issues impacting on human health. However, Chapter 8 has concluded that there will be no significant air quality impacts. All ambient air quality legislative limits will be complied with and therefore the predicted impact is not significant with a neutral effect on human health. Air quality is discussed further in Chapter 8 of this EIAR.

4.9.3 Land and Soil

Dust from the site and from soil spillages on the existing road network around the site may impact human health, especially during dry conditions. Best practise measures and mitigation measures have been identified in Chapter 6 of this EIAR. No significant impacts are predicted in relation to land and soil and as such there will be no significant impact on population and human health.

4.9.4 Hydrology

Pollution events can impact the water quality and thus impact the human health of the surrounding population. Appropriate surface water and foul water control measures will be implemented as part of the Proposed Development. No public health issues associated with the water conditions at the Site have been identified for the Construction Phase or Operational Phase of the Proposed Development. There are no likely significant adverse impacts as a result of Hydrology and as such there will be no significant impacts on population and human health. Hydrology has been fully assessed in Chapter 7 of this EIAR.

4.9.5 Landscape and Visual

The Proposed Development will alter the visual appearance of the Site which is predominantly a greenfield Site. It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the Site of the Proposed Development and the rural and residential nature of the surrounding landscape, will not cause any significant impacts and as such there will be no significant impact on population and human health.

4.9.6 Material Assets – Waste and Utilities

The improper removal, handling and storage of hazardous waste has the potential to negatively impact on the health of construction workers. The Preliminary Construction and Demolition Waste Management Plan (CDWMP) (Waterman Moylan, 2022) and CEMP (Enviroguide, 2022) details mitigation measures to ensure the safety of the workers. Extended power or telecommunications outages, or disruption to water supply or sewerage systems for existing properties in the area could negatively impact on the surrounding human population and their overall health. Chapter 12 of this EIAR has concluded there will be no significant

impacts on the Material Assets (Waste and Utilities) as a result of the Proposed Development subsequently there will be no significant impact on population and human health.

4.9.7 Material Assets: Traffic

Construction activities will result in an increased number of HGV movements during the Construction Phase. The Proposed Development will also result in an increase in the population of the surrounding area and subsequently an increase in the number of vehicles. There is potential for significant impacts on population and human health in relation to the capacity and operation of the surrounding road network. No traffic routes are predicted to experience increases of more than 25% in total traffic flows during the Operational Phase. The overall impact of the Proposed Development on the transportation infrastructure in the local area will not be significant and subsequently there will be no significant impact on population and human health.

4.10 Difficulties Encountered When Compiling

No difficulties were encountered in the preparation of this Chapter of the EIAR.

4.11 References

The Central Statistics Office (CSO)

Dublin City Development Plan (2016-2022)

The Regional Planning Guidelines of the Greater Dublin Area 2010-2022

Ordinance Survey Ireland (OSI)

Odour Emissions Guidance Note (Air Guidance Note AG9), Environmental Protection Agency (September 2019).

WHO Ottawa Charter for Health Promotion First International Conference on Health Promotion Ottawa, 21 November 1986 - WHO/HPR/HEP/95.1. 1986.

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

Healthy Ireland Framework 2013-2025

Health Impact Assessment Guidance, Institute of Public Health in Ireland 2009

Farrell, C., McAvoy, H., Wilde, J. and Combat Poverty Agency (2008), Tackling Health Inequalities – An All-Ireland Approach to Social Determinants. Dublin: Combat Poverty Agency/Institute of Public Health in Ireland.

Wilkinson, Richard; Marmot, Michael, eds. (2003). The Social Determinants of Health: The Solid Facts (PDF) (2nd ed.). World Health Organization Europe.

Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Communities 1999)

5 BIODIVERSITY

5.1 Introduction

This Chapter describes the ecology of the Site of the Proposed Development and its zone of influence, with emphasis on habitats, flora and fauna and outlines the methodology of assessment. The Proposed Development is located in the northern suburbs of Dublin City, c. 5km from the city centre, in an established residential area. The site of the Proposed Development is located east of the R808 Sybil Hill Road, immediately east of St Paul's College (Secondary School) and Sybil Hill House (a protected structure), in Raheny, Dublin 5. The R808 Sybil Hill Road runs north-south connecting the R105 Howth Road (north of the Proposed Development) with the R807 Clontarf Road (to the south).

It provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance, and proposes measures for the mitigation of these impacts, where appropriate.

The Chapter has been completed having regard to the *Guidelines for Ecological Impact Assessment in the UK and Ireland*, by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018), and the National Roads Authority's (NRA) *Ecological Assessment Guidelines* (NRA, 2009) together with the guidance outlined in the Environmental Protection Agency documents *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (May 2022) and *Advice Notes for Preparing Environmental Impact Statements* (Draft, September 2015).

5.1.1 Quality Assurance and Competence

All surveying and reporting have been carried out by qualified and experienced ecologists and environmental consultants. Liam Gaffney, Senior Ecologist with Enviroguide Consulting, undertook on-site surveys, desktop research and report writing for this report. Liam Gaffney has a M.Sc. Hons. (Wildlife Conservation and Management) from University College Dublin, and a wealth of experience in desktop research, literature scoping-review, and report writing; as well as practical field experience (Habitat surveys, Invasive species surveys, Wintering bird surveys, large mammals, fresh water macro-invertebrates etc.). Liam has extensive experience in compiling Biodiversity Chapters of EIARs, EclA, AA screening and NIS reports, and in the overall assessment of potential impacts to ecological receptors from a range of development types. Liam is also a Qualifying member of CIEEM, the Chartered Institute of Ecology and Environmental Management.

Dr Siobhán Atkinson is a Senior Ecologist at Enviroguide Consulting and is responsible for carrying out freshwater surveys. Siobhán has a B.Sc. (Hons) in Environmental Biology and a Ph.D. in Freshwater Biology from University College Dublin, and extensive experience in Geographic Information Systems (GIS), desktop research, literature review and reporting, as well as practical field and laboratory experience including environmental DNA analysis, freshwater macroinvertebrate sampling, and identification, physical river habitat surveys, fish sampling and processing and terrestrial habitat surveying. Siobhán has prepared Ecological Impact Assessments (EclA), Stage I and Stage II Appropriate Assessment Reports, Habitat

Surveys and Invasive Species Surveys and input and reviewed Ecological and Environmental assessments for several EIA Reports. Siobhán is the first author of several publications relating to barriers to riverine connectivity in Ireland.

Eric Dempsey is an Environmental Consultant and Ornithologist who has worked on a wide range of conservation, research, and ecological monitoring projects across Ireland. Eric is the author of the best-selling books, *The Complete Field Guide to Ireland's Birds* and *Finding Birds in Ireland* and is experienced in coordinating and undertaking surveys along with being highly proficient in report writing and data management. Eric is highly experienced with all survey methodology and has inputted in various Environmental Impact Assessment Reports, Environmental Assessments and Appropriate Assessments.

External consultant Rob Gandola completed amphibian surveys as part of this assessment. Rob has an MSc in Ecology from Bangor University, Wales and a BSc (hons) Zoology from UCD. He provides training and professional advice to Local and National Authorities, heritage rangers, NGOs, and community groups in Ireland and Northern Ireland, and regularly carries out surveys and implements monitoring projects on their behalf. He is also holds the position of Senior Scientific Officer for the Herpetological society of Ireland.

Brian Keeley is a Professional Ecologist/ Bat Ecologist, and Co-director of Wildlife Services Ireland. Brian Keeley was a founder member of the Dublin Bat Group in 1989 and was also a founder-member of Bat Conservation Ireland, of which he is currently Chairperson. Wildlife Services Ireland are active with the Bailieborough branch of the Irish Wildlife Trust and have established a network of IWT nature reserves in the North Meath, Cavan and Monaghan area on farms volunteered by the owners for this purpose

5.2 Relevant Legislation

An Ecological Impact Assessment (EclA) is a process of identifying, quantifying, and evaluating potential effects of development-related, or other actions, on habitats, species and ecosystems (CIEEM, 2016). The Proposed Development that is the subject of this Biodiversity chapter meets the requirements for an Environmental Impact Assessment (EIA) under Schedule 5, Part 2 10, (b) of the Planning and Development Regulations 2001, as amended.

5.2.1 National Legislation

5.2.1.1 Wildlife Act 1976 and amendments

The Wildlife Act 1976 was enacted to provide protection to birds, animals, and plants in Ireland and to control activities which may have an adverse impact on the conservation of wildlife. In regard to the listed species, it is an offence to disturb, injure or damage their breeding or resting place wherever these occur without an appropriate licence from National Parks and Wildlife Service (NPWS). This list includes all birds along with their nests and eggs. Intentional destruction of an active nest from the building stage up until the chicks have fledged is an offence. This includes the cutting of hedgerows from the 1st of March to the 31st of August.

The Act also provides a mechanism to give statutory protection to Natural Heritage Areas (NHAs) from the date they are proposed for designation i.e., at a time they become proposed Heritage Areas (pNHAs). The Wildlife Amendment Act 2000 widened the scope of the Act to

include most species, including the majority of fish and aquatic invertebrate species which were excluded from the 1976 Act.

5.2.1.2 EU Habitats Directive 1992 and EC (Birds and Natural Habitats) Regulations 2011

The EU Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive 1992) provides protection to particular species and habitats throughout Europe. The Habitats Directive has been transposed into Irish law through the EC (Birds and Natural Habitats) Regulations 2011.

Annex IV of the EU Habitats Directive provides protection to a number of listed species, wherever they occur. Under Regulation 23 of the Habitat Directive any person who, in regard to the listed species; *“Deliberately captures or kills any specimen of these species in the wild, deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration, deliberately takes or destroys the eggs from the wild, or damages or destroys a breeding site or resting place of such an animal shall be guilty of an offence.”*

5.2.1.3 Flora (Protection) Order, 2015

The Flora (Protection) Order (S.I. No. 356/2015) affords protection to several species of plant in Ireland, including 68 vascular plants, 40 mosses, 25 liverworts, 1 stonewort and 1 lichen. This Act makes it illegal for anyone to uproot, cut or damage any of the listed plant species and it also forbids anyone from altering, interfering, or damaging their habitats. This protection is not confined to within designated conservation sites and applies wherever the plants are found.

5.2.1.4 Inland Fisheries Acts 1959 to 2017

The Inland Fisheries Act 2010 established Inland Fisheries Ireland (Iascach Intíre Éireann) and defined its functions as the state agency responsible for the conservation, protection, management, marketing, development and improvement of our inland fisheries and sea angling resources. Ireland has over 74,000 kilometres of rivers and streams and around 128,000 hectares of lakes, all of which fall under the jurisdiction of Inland Fisheries Ireland. The Fisheries (Consolidation) Act, 1959 (and additional legislation to 2017) provides for the conservation and management of both freshwater and marine fishes in and around Ireland. It covers areas such as the use of gear and fishing restrictions, including trade in fish. Furthermore, it outlines the Minister's regulation-making powers.

5.2.1.5 Invasive Species Legislation

Certain plant species and their hybrids are listed as Invasive Alien Plant Species in Part 1 of the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations 2011* (SI 477 of 2011, as amended). In addition, soils and other material containing such invasive plant material, are classified in Part 3 of the Third Schedule as vector materials and are subject to the same strict legal controls.

Failure to comply with the legal requirements set down in this legislation can result in either civil or criminal prosecution, or both, with very severe penalties accruing. Convicted parties under the Act can be fined up to €500,000.00, jailed for up to 3 years, or both.

Extracts from the relevant sections of the regulations are reproduced below.

“49(2) Save in accordance with a licence granted [by the Department of Arts, Heritage and the Gaeltacht], any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in anyplace [a restricted non-native plant], shall be guilty of an offence.

49(3) ... it shall be a defence to a charge of committing an offence under paragraph (1) or (2) to prove that the accused took all reasonable steps and exercised all due diligence to avoid committing the offence.

50(1) Save in accordance with a licence, a person shall be guilty of an offence if he or she [...] offers or exposes for sale, transportation, distribution, introduction, or release—

(a) an animal or plant listed in Part 1 or Part 2 of the Third Schedule,

(b) anything from which an animal or plant referred to in subparagraph (a) can be reproduced or propagated, or

(c) a vector material listed in the Third Schedule, in any place in the State specified in the third column of the Third Schedule in relation to such an animal, plant or vector material.”

5.2.1.6 Planning and Development Act 2000 - 2022, (as amended).

The Planning and Development Act 2000 – 2022 (as amended) forms the foundations for planning in Ireland. This Act covers a huge range of planning-related issues and consolidates a wide range of legislation. The principal regulations underpinning the Planning and Development Acts are the Planning and Development Regulations 2001 (S.I. No. 600 of 2001). A number of Regulations amending the 2001 Regulations have been made, which, taken together, are collectively cited as the Planning and Development Regulations 2001 to 2022.

5.2.2 EU Legislation

5.2.2.1 EU Birds Directive

The Birds Directive provides a level of general protection for all wild birds throughout the European Union. Annex I of the Birds Directive includes a total of 194 bird species that are considered rare, vulnerable to habitat changes or in danger of extinction within the European Union. Article 4 establishes that there should be a sustainable management of hunting of listed species, and that any large scale non-selective killing of birds must be outlawed. The Directive requires the designation of Special Protection Areas (SPAs) for: listed and rare species, regularly occurring migratory species and for wetlands which attract large numbers of birds. There are 25 Annex I species that regularly occur in Ireland and a total of 154 Special Protection Areas have been designated.

5.2.2.2 EU Habitats Directive

The Habitats Directive aims to protect 220 habitats and approx. 1000 species throughout Europe. The habitats and species are listed in the Directive's annexes where Annex I covers habitats and Annex II, IV and V cover species. There are 59 Annex I habitats in Ireland and 33 Annex IV species which require strict protection wherever they occur. The Directive requires the designation of Special Areas of Conservation for areas of habitat deemed to be of European interest. The SACs together with the SPAs from the Birds Directive form a network of protected sites called Natura 2000.

5.2.2.3 Water Framework Directive

The EU Water Framework Directive (WFD) 2000/60/EC is an important piece of environmental legislation which aims to protect and improve water quality. It applies to rivers, lakes, groundwater, estuaries, and coastal waters. The Water Framework Directive was agreed by all individual EU member states in 2000, and its first cycle ran from 2009 – 2015. The Directive runs in 6-year cycles, so the second (current) cycle runs from 2016 – 2021. The aim of the WFD is to prevent any deterioration in the existing status of water quality, including the protection of good and high water quality status where it exists. The WFD requires member states to manage their water resources on an integrated basis to achieve at least 'good' ecological status, through River Basin Management Plans (RBMP), by 2027.

5.2.2.4 EIA Directive

Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014, hereafter referred to as the EIA Directive.

5.2.3 International Conventions

5.2.3.1 Bern and Bonn Convention

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) was enacted to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was introduced in order to give protection to migratory species across borders in Europe.

5.2.3.2 Ramsar Convention

The Ramsar Convention on Wetlands is an intergovernmental treaty signed in Ramsar, Iran, in 1971. The treaty is a commitment for national action and international cooperation for the conservation of wetlands and their resources. In Ireland there are currently 45 Ramsar sites which cover a total area of 66,994ha.

5.3 Study Methodology

This section details the steps and methodology employed to undertake the ecological impact assessment of the Proposed Development.

5.3.1 Desk Study

A desk study was carried out to collate and review available information, datasets and documentation sources pertaining to the site's natural environment. The desk study, completed in December 2021, relied on the following sources:

- Information on species records¹ and distributions, obtained from the National Biodiversity Data Centre (NBDC) at maps.biodiversityireland.ie;

¹ The proposed development site lies within the 10km grid square O23, the 2km grid square O23D and the 1km grid square O2037. Records from the last 30 years from available datasets are given in the relevant sections of this report.

- Information on waterbodies, catchment areas and hydrological connections obtained from the Environmental Protection Agency (**EPA**) at gis.epa.ie;
- Information on bedrock, groundwater, aquifers and their statuses, obtained from Geological Survey Ireland (**GSI**) at www.gsi.ie;
- Information on the network designated conservation sites, site boundaries, qualifying interests and conservation objectives, obtained from the National Parks and Wildlife Service (**NPWS**) at www.npws.ie;
- Satellite imagery and mapping obtained from various sources and dates including Google, Digital Globe, Bing and Ordnance Survey Ireland;
- Information on the existence of permitted development, or developments awaiting decision, in the vicinity of the Proposed Development from Dublin City Council, available at www.dublincity.ie ; Fingal County Council www.fingalcoco.ie and An Bord Pleanála www.pleanala.ie
- Information on the extent, nature and location of the Proposed Development, provided by the applicant and/or their design team;
- Information on the construction methods to be followed as part of the Proposed Development, taken from the Construction Environment Management Plan (**CEMP**) submitted with this application;
- Information on the potential for flood events at the site of the Proposed Development, informed by the Flood Risk Assessment submitted with this application;
- The applicable 1% international population estimate figures for relevant SCI species taken from Wetlands International (2012);
- The applicable 1% national population estimate figures for relevant Species of Conservation Interest (**SCI**) species taken from Burke *et al.* (2018); and
- Data on the usage of coastal sites in Dublin by Light-bellied Brent Geese from the Irish Wetland Bird Survey (**I-WeBS**), a scheme that is funded by the National Parks and Wildlife Service of the Department of Culture, Heritage & the Gaeltacht and that is co-ordinated by BirdWatch Ireland.

A comprehensive list of all the specific documents and information sources consulted in the completion of this Chapter is provided in Section 5.12.

5.3.2 Field Surveys

A suite of ecological surveys has been carried out at the Site of the Proposed Development between 2015 and 2022.

Surveys for 2018, 2019, 2020, 2021 and 2022 were undertaken by Enviroguide Consulting (**EG**), the authors of this report. Surveys carried out from 2015 to 2017 were undertaken by Scott Cawley (**SC**) Ltd. in respect to a previous strategic housing development application at the Site (Planning Reference: 300559-18).

5.3.2.1 Habitat Surveying and Mapping

Five (5 no.) habitat surveys were conducted at the site of the Proposed Development on the 18th May 2015, 6th July 2017, 14th May 2019, 25th May 2021 and 10th December 2021.

Habitats were categorised according to the Heritage Council's '*A Guide to Habitats in Ireland*' (Fossitt, 2000) to level 3. The habitat mapping exercise had regard to the '*Best Practice Guidance for Habitat Survey and Mapping*' (Smith *et al.*, 2010) published by the Heritage Council. Aerial photography was used together with GPS to accurately enable field navigation. Habitat categories, characteristic plant species and other ecological features and resources were recorded on field sheets.

5.3.2.2 Bat Surveys

A suite of bat surveys has been completed as part of this assessment, as detailed in the following sections.

5.3.2.2.1 Potential Bat Roost (PBR) and Commuting/foraging Habitat Survey

Bat roost inspection surveys were carried out on the 16th of May 2019 and the 26th July 2022. Survey methodology followed the best-practice techniques outlined in the Bat Conservation Trusts "*Bat Surveys for Professional Ecologists*" (3rd edition, 2016) guidelines. The buildings within the site of the Proposed Development, including the existing prefab building scheduled for demolition as part of the Proposed Development at that time, were systematically inspected both externally and internally for any signs of roosting bats. This included searches for live/dead specimens, droppings, urine splashes and fur-oil stains.

Mature trees located within the site of the Proposed Development were also inspected from ground-level for their suitability to support roosting bats.

26th July 2022 Surveys

Potential Bat Roost (PBR) and commuting/foraging habitat suitability surveys were conducted during the day of the 26th of July, prior to the bat activity survey. The PBR survey assessed the prefabricated (prefab) classroom marked for demolition in the west of the Site, along with the mature trees set for felling in the north-western section.

The prefab was assessed externally during the daylight for any PBR features or access points by which bats may enter or exit the structure e.g., building damage, cavity spaces, broken windows etc. The perimeter of the structure was walked by the surveyor and notes and photos taken of any PBR features present. The prefab was then inspected internally with each room checked for PBR features or access points that might be used by bats to enter/exit the structure. It is noted that the western half of the building was sealed off and inaccessible on the night of survey, however the eastern half was accessed and surveyed.

Daytime inspections were undertaken of all of the trees within the Site of the Proposed Development in order to make a list of trees within the Site that may be suitable as roosting sites for bats. Inspections were undertaken visually, from the ground, with the aid of a strong torch beam. Trees within the Site were assessed for Potential Roost Features (PRFs) which were used to determine the potential bat roost value of trees as per Table 4.1 in the Bat Conservation Trust's *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016). Evidence of bat usage was sought in the form of actual bats (visible or audible), bat droppings, urine staining, grease marks (oily secretions from glands present on stonework) and claw marks. In addition, the presence of bat fly pupae (bat parasite) also can indicate that bat usage, of a crevice for example, has occurred in the past.

The Site was assessed during daytime walkabout surveys (26/07/2022), in relation to potential bat foraging habitat and commuting routes. Bat habitats and commuting routes identified were considered in relation to the wider landscape to determine landscape connectivity for local bat populations through the examination of aerial photographs.

5.3.2.2.2 Activity Surveys

Two no. dusk transect bat activity surveys were carried out at the Site of the Proposed Development; one on 7th September 2021 and one on 26th July 2022.

Survey methodology followed the best-practice techniques outlined in the Bat Conservation Trusts "*Bat Surveys for Professional Ecologists*" Good Practice Guidelines (3rd edition, 2016) guidelines. Post-sunset (dusk) activity surveys were commenced approximately 15 minutes before sunset and lasted until approximately 1.5 – 2 hours after sunset.

26th July 2022 Dusk Activity Survey

A dusk bat activity survey was undertaken at the Site on the evening of the 26/07/2022. The bat activity survey commenced at 21:15 and finished at 00:00. Sunset on the night was 21:30. The survey was conducted in optimal conditions for bat surveys i.e., calm, dry and warm with temperatures of 19c and 13c at the start and end of the survey, respectively.

The bat surveyors were equipped with an Elekon BatLogger M2 full spectrum bat detector, powerful head torches and handheld torch, along with aerial maps of the Site.

A predetermined transect of the Site based on the daytime walkover was walked during the activity survey, allowing the Site's field boundaries and areas of vegetation to be surveyed for bat usage. Where activity was noted, the surveyors remained in place for several minutes to ensure a representation of the activity was recorded.

5.3.2.2.3 Emergence Survey

16th May 2019

A bat emergence survey was carried out at the existing pre-fab building structure to be demolished as part of the Proposed Development on 16th May 2019. The survey began approximately 15 minutes before sunset and lasted until approximately 1.5 hours after sunset. A *SSF Bat2* heterodyne bat detector was used to detect any bats emerging from the structure during the survey. The details of all records (frequency, time, location) were recorded on field sheets and 1:250 field map.

26th July 2022

An emergence survey was carried out at the beginning of the activity survey; lasting from 21:20 to 22:00, with one surveyor focusing on a potential entrance point to the prefab along its south-western corner (See Figure 5-1), and the other surveyor focusing on a mature Horse Chestnut Tree (Tree tag 38) located adjacent to the north of the prefab; due to it supporting visible cavities at height (moderate-high roost suitability) (See Figure 5-2).



Figure 5-1 Image showing the locations of the surveyors during the emergence survey conducted on 26th July 2022. Red circles indicate the focus point of each surveyor i.e., the south-western corner of the prefab and tree 38 to the north-west

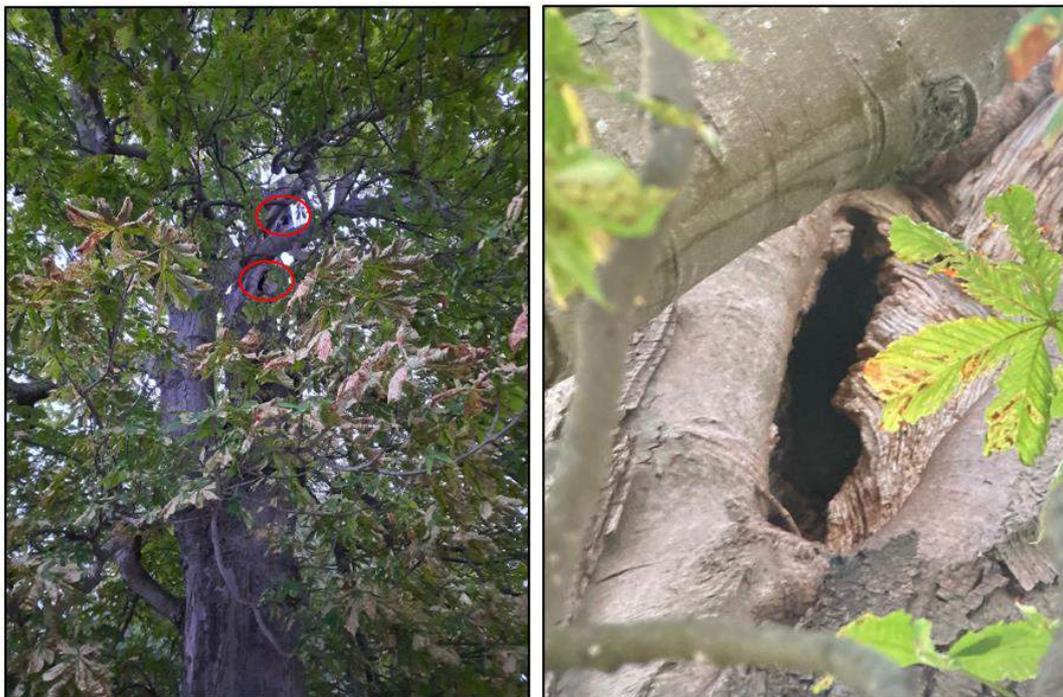


Figure 5-2 Tree 38, the subject of the emergence survey. Visible holes observed at height (red circles) and close up image of main hole.

5.3.2.3 Breeding Bird Surveys

Breeding Bird Surveys were undertaken on 25th May and 30th July 2021. The survey methodology follows the British Trust for Ornithology's (**BTO**) *Common Bird Census (CBS)* technique (Bibby *et al.*, 1992). A pre-determined transect is walked and all bird species encountered are recorded on field sheets, along with the corresponding breeding evidence code, location (on 1:500 field maps), behaviour and numbers.

Breeding bird surveys for previous seasons were undertaken on 25th June 2016, 28th June 2017, 30th May 2017 and on three 3 (no.) days between March 2019 and May 2019 (i.e., 1st March, 30th April & 27th May).

5.3.2.4 Wintering Bird Surveys

A suite of wintering bird surveys (**WBS**) has been undertaken in relation to the Proposed Development between 2015 and 2022. Surveys carried out for the 2015/16 and 2016/17 winter seasons were completed by SC, in respect of a previous planning application at the site of the Proposed Development. Surveys for the 2018/19, 2019/20 and 2020/21 and 2021/22 winter seasons were undertaken by EG, the authors of this report. The methodology and details of these surveys is set out in detail in the NIS submitted as a separate document with this planning application.

Surveys were carried out during a series of visits at the Site during each survey season with shorebird and wildfowl species recorded in relation to their location (on 1:500 field maps), behaviour and numbers.

5.3.2.5 Mammal Surveys

Four 4 (no.) walkover mammal surveys were undertaken at the site of the Proposed Development on the 7th March 2019, 12th March 2019, 14th May 2019 and 10th December 2021. In addition, any signs of mammal presence were recorded, where relevant, during other ecological surveys undertaken at the site of the Proposed Development between 2015 and 2021.

The site of the Proposed Development was searched for tracks and signs of mammals. The habitat types recorded throughout the survey area were used to assist in identifying the fauna considered likely to utilise the area. During these surveys, the Site was searched for tracks and signs of mammals as per Bang and Dahlstrom (2001).

A set of focused badger surveys of the Site were conducted by Mammal specialist Brian Keeley between July 1st and August 3rd, 2022. These surveys involved examining all hedgerows, scrub, mounds, and other areas where setts were possible, from ditches, drains, dense vegetation to suitable slopes and banks. A motion-activated camera was installed under licence on July 18th, 2022, and remained in place and recorded up to August 3rd 2022.

With regard to the timing of the badger surveys, the setts were identified in December 2021, the optimal period for surveying for setts due to the vegetation growth being limited at this time. The subsequent surveys of the setts found on Site were conducted by Mr Keeley in July/August at which point the sett location was known and the levels of vegetation had no bearing on the surveys. Mr Keeley notes in his report (Appendix E) that the timing was perfect

for assessment of the sett and the vegetation did not affect the success of the assessment. The Badger Assessment Report states:

“Survey constraints

The date was not ideal for identifying features such as badger latrines but as the key focus of this assessment was the level of activity and nature of the sett, the timing for the badger survey was perfect. The height and density of vegetation was a hindrance to access but did not affect the success of the assessment’s central aim.”

The goal of the surveys was to ascertain the nature of and activity at the sett i.e., was it a main breeding sett, how many badgers use it etc. These goals were achieved by the identification of a family of 5 badgers including two cubs by Brian’s camera surveys in July/August. Thus, there is no reason for these surveys to be questioned in terms of timing.

5.3.2.6 Other Fauna

During all surveys at the site of the Proposed Development, other species of fauna were noted, and these are included in the report where applicable.

5.3.2.6.1 Amphibian Survey

One 1 (no.) day-time amphibian survey was undertaken at the site of the Proposed Development and immediate surrounding area on 7th March 2019 by Enviroguide Consulting.

A further set of amphibian surveys were undertaken by Amphibian specialist Rob Gandola on 8th and 10th of July 2022. Supplementary surveys were conducted during daylight hours on 16th and 17th July 2022, respectively as access to the Model Gardens was not possible at night.

Standard survey methods appropriate for detecting amphibians e.g., visual encounter searches via torch lighting and dip netting, were employed. Submerged funnel traps were not deployed during these surveys as (i) the water bodies were sufficiently shallow and/or clear to permit conclusive visual encounter surveys combined with dip net sampling; and (ii) the surveys were undertaken at a suboptimal time for detection of adult newts and their larvae, or frog tadpoles, particularly in waterbodies that contain multiple species of fish that are known to prey on native amphibians, their eggs, and larvae. Any natural or artificial refugia present near the waterbodies were inspected (e.g., wood stumps). Visual encounter surveys and dip netting surveys were conducted at each pond except from the ditch north of Belgrove Park. An incident whereby foul water/sewerage had entered the ditch via an inlet from the western side of the park rendering dip netting an unhygienic endeavour. All visual encounter surveys were conducted during periods of suitable weather (warm, calm, and humid without mist/very light rain). All sightings of a focal species or other deemed relevant, were recorded on a Garmin 60CSx GPS unit or suitably equipped smart phone.

Given the timing of the surveys, common frog spawn counts and breeding effort estimation were not possible. However, this is not a source of concern or a limitation to the assessment as, in this case, the Site of the Proposed Development supports no areas of standing water nor other wetland habitats i.e., no suitable breeding habitat, and no amphibians were recorded or would be expected at the Site according to Mr. Gandola’s report. The amphibian assessment covered various other locations within St. Anne’s Park that might support

amphibians, even when these sites are not all connected to the Site. Therefore, the report goes above and beyond what is necessary in terms of assessing amphibians in the context of the Proposed Development, please see Amphibian Report appended in Appendix F for further details.

5.3.2.6.2 Freshwater Biological Assessment of Naniken Stream

A walkover survey of the length of the Naniken stream from where it enters St. Annes Park to where it outflows into Dublin Bay was undertaken on the 24th of September 2021 by Dr Siobhán Atkinson of Enviroguide Consulting. The aim of the walkover survey was to undertake a general physical habitat assessment of the river channel and riverbanks and fisheries habitat assessment. A macro-invertebrate sample was collected and assessed to determine the biological water quality (Q Rating) of the stream. Live macroinvertebrate samples were sorted on the riverbank on a white tray using a head torch. Taxa were preserved in 70% Industrial Methylated Spirits (IMS) and identified by microscope. An EPA Q-value classification was assigned to each sample by recording the taxa present at a suitable taxonomic resolution and their categorical relative abundance.

5.3.3 Assessment

The value of the ecological resources, the habitats and species present or potentially present, was determined using the ecological evaluation guidance given in the National Roads Authority's (NRA) Ecological Assessment Guidelines (NRA, 2009). This evaluation scheme, with values ranging from locally important to internationally important, seeks to provide value ratings for habitats and species present that are considered ecological receptors of impacts that may ensue from a proposal. The NRA Guidelines (2009) define key ecological receptors (KERS) as those ecological features which are evaluated as Locally Important (higher value) or higher, that are likely to be impacted significantly by the Proposed Development. Internationally important receptors would include Special Areas of Conservation (SAC) or Special Protected Areas (SPA) while those of national importance would include Natural Heritage Areas (NHA).

This evaluation scheme has been adapted here to assess the value of habitats and fauna within the site of the Proposed Development. The value of habitats is assessed based on the condition, size, rarity, conservation, and legal status. The value of fauna is assessed on its biodiversity value, legal status, and conservation status. Biodiversity value is based on its national distribution, abundance or rarity, and associated trends.

Using the evaluation criteria as described above, some of the habitats and species identified as being present were assessed. Any of those selected that were evaluated as being of Local Importance (higher value) and higher in this study were selected as KERS and then the impact significance on each of these receptors was assessed.

5.3.3.1 Value of Ecological Receptors

The ecological features identified within the site of the Proposed Development and wider area are evaluated based on their value. These values are detailed in Table 5-1 and are taken from the Guidelines for Assessment of Ecological Impacts of National Road Schemes published by the National Roads Authority (NRA), now Transport Infrastructure Ireland (TII).

Table 5-1 Description of values for ecological resources based on geographic hierarchy of importance (NRA, 2009b)

Importance	Criteria
International Importance	<ul style="list-style-type: none"> - 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. - Proposed Special Protection Area (pSPA). - Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). - Features essential to maintaining the coherence of the Natura 2000 Network - Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. - Resident or regularly occurring populations (assessed to be important at the national level) of the following: <ul style="list-style-type: none"> o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive - Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). - World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). - Biosphere Reserve (UNESCO Man & The Biosphere Programme) - Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). - Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). - Biogenetic Reserve under the Council of Europe. - European Diploma Site under the Council of Europe. - Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National Importance	<ul style="list-style-type: none"> - Site designated or proposed as a Natural Heritage Area (NHA). - Statutory Nature Reserve. - Refuge for Fauna and Flora protected under the Wildlife Acts. - National Park. - Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. - Resident or regularly occurring populations (assessed to be important at the national level) of the following: <ul style="list-style-type: none"> o Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Sites containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive
County Importance	<ul style="list-style-type: none"> - Area of Special Amenity. - Area subject to a Tree Preservation Order. - Area of High Amenity, or equivalent, designated under the County Development Plan. - Resident or regularly occurring populations (assessed to be important at the County level) of the following: <ul style="list-style-type: none"> o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; o Species protected under the Wildlife Acts; and/or o Species listed on the relevant Red Data list.

Importance	Criteria
	<ul style="list-style-type: none"> ○ Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. - County important populations of species; or viable areas of semi-natural habitats; or natural heritage features identified in the National or Local BAP; if this has been prepared. - Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. - Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local Importance (higher value)	<ul style="list-style-type: none"> - Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared; - Resident or regularly occurring populations (assessed to be important at the Local level) of the following: <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 o ○ Species listed on the relevant Red Data list. ○ 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; - 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.
Local Importance (lower value)	<ul style="list-style-type: none"> - Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; - Sites or features containing non-native species that is of some importance in maintaining habitat links.

5.3.3.2 Impact Assessment Criteria

Once the value of the identified ecological receptors was determined, the next step was to assess the potential effect or impact of the Proposed Development on the identified KERs. This was carried out with regard to the criteria outlined in various impact assessment guidelines (NRA, 2009; CIEEM, 2018) that set down a number of parameters such as quality, magnitude, extent, and duration that should be considered when determining which elements of the proposal could constitute impact or sources of impacts. Once impacts are defined, their significance was categorised using the EPA *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2022).

Identification of a risk does not constitute a prediction that it will occur, or that it will create or cause significant impact. However, identification of the risk does mean that there is a possibility of ecological or environmental damage occurring, with the level and significance of the impact depending upon the nature and exposure to the risk and the characteristics of the ecological receptor.

5.3.3.2.1 Criteria used to Define Quality of Effects

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the quality of effects. See Table 5-2.

Table 5-2 Definition of Quality of Effects

Quality	Definition
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).

5.3.3.2.2 Criteria used to Define Significance of Effects

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the significance of impacts. See Table 5-3.

Table 5-3 Definition of Significance of Effects

Significance of Effects	Definition
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	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

5.3.3.2.3 Criteria used to Define Duration of Effects

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying duration and frequency of effects. See Table 5-4.

Table 5-4 Definition of Duration of Effects

Quality	Definition
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

5.4 The Existing and Receiving Environment (Baseline Situation)

5.4.1 Site Overview

The Site of the Proposed Development is located to the east of St Paul's College (Secondary School) and is accessed via the R808 Sybil Hill Road, Raheny, Dublin 5. St Anne's Park borders the site to the north, east and south. The Site is bordered to the west by St Paul's College, Sybil Hill House (a protected structure) and some residential dwellings. The 4-storey Convent building / grounds of the Little Sisters of the Poor is located to the immediate west of Sybil Hill Road.

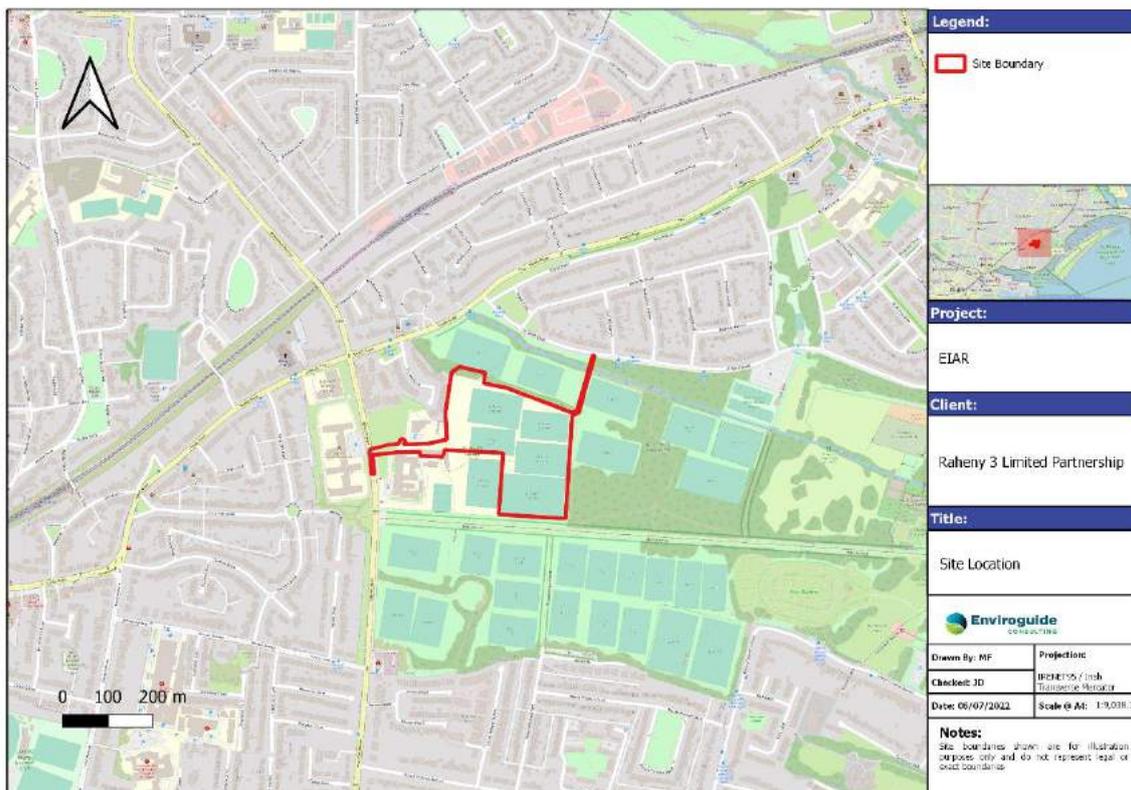


Figure 5-3: Site Location Map

Dublin 5 and the wider local area are located within the *Dublin* groundwater body. The overall status (2013 - 2018) of this waterbody is recorded as *Good* (EPA, 2021). The groundwater rock units underlying the area are classified as *Dinantian Upper Impure Limestones* and the sub-soil at the site is classified as both *man-made* and *Limestone till (Carboniferous)*. The site of the Proposed Development is located on a *locally important* aquifer with groundwater vulnerability in the area listed as *Low*.

The site of the Proposed Development is located within the Mayne River sub-catchment (*Mayne_SC_010*) and the Santry sub-basin (*Santry_020*). The Naniken Stream² (*EPA code: 09N04*) flows c. 100m to the north of the site of the Proposed Development, within St Anne's Park. The Naniken Stream flows easterly for c. 1.7km from where it exits the culvert under the Clontarf Road (R807), to where it enters the south lagoon at North Bull Island.

5.4.2 Designated Sites

5.4.2.1 Sites of International Importance

Table 5-5 presents details of the key ecological features of the European sites within 15km of the Proposed Development. Designated sites outside of this 15km radius were not assessed further, as they are either located a considerable physical distance inland, separated by a

² It should be noted that the terms Naniken River and Naniken Stream are interchangeable and for the purpose of this planning application and all supporting reports and documentation both names refer to the same waterbody.

substantial marine buffer, and/or located within different surface water catchment zones to the Proposed Development.

Table 5-5 European sites located within 15km of the Site of the Proposed Development

Site Code	Site Name	Qualifying Interests	Distance to Site
Special Areas of Conservation (SAC)			
000206	North Dublin Bay SAC	Annex I Habitats: <ul style="list-style-type: none"> - [1140] Tidal Mudflats and Sandflats - [1210] Annual Vegetation of Drift Lines - [1310] Salicornia Mud - [1330] Atlantic Salt Meadows - [1410] Mediterranean Salt Meadows - [2110] Embryonic Shifting Dunes - [2120] Marram Dunes (White Dunes) - [2130] Fixed Dunes (Grey Dunes)* - [2190] Humid Dune Slacks Annex II Species: <ul style="list-style-type: none"> - [1395] Petalwort (<i>Petalophyllum ralfsii</i>) 	1.1km
000210	South Dublin Bay SAC	Annex I Habitats: <ul style="list-style-type: none"> - [1140] Tidal Mudflats and Sandflats - [1210] Annual vegetation of drift lines - [1310] Salicornia and other annuals colonising mud and sand - [2110] Embryonic shifting dunes 	3.5km
000199	Baldoye Bay SAC	Annex I Habitats: <ul style="list-style-type: none"> - [1140] Tidal Mudflats and Sandflats not covered by water at low tide. - [1310] Salicornia Mud - [1330] Atlantic Salt Meadows - [1410] Mediterranean Salt Meadows 	4.7km
000202	Howth Head SAC	Annex I Habitats: <ul style="list-style-type: none"> - [1230] Vegetated Sea Cliffs - [4030] Dry Heath 	5.9km
003000	Rockabill to Dalkey Island SAC	Annex I Habitats: <ul style="list-style-type: none"> - [1170] Reefs Annex II Species: <ul style="list-style-type: none"> - [1351] Harbour Porpoise (<i>Phocoena phocoena</i>) 	6.6km
000205	Malahide Estuary SAC	Annex I Habitats: <ul style="list-style-type: none"> - [1140] Tidal Mudflats and Sandflats - [1310] Salicornia Mud - [1330] Atlantic Salt Meadows - [1410] Mediterranean Salt Meadows - [2120] Marram Dunes (White Dunes) - [2130] Fixed Dunes (Grey Dunes)* 	7.9km
002193	Ireland's Eye SAC	Annex I Habitats: <ul style="list-style-type: none"> - [1220] Perennial Vegetation of Stony Banks 	8.6km

Site Code	Site Name	Qualifying Interests	Distance to Site
		- [1230] Vegetated Sea Cliffs	
000208	Rogerstown Estuary SAC	Annex I Habitats: <ul style="list-style-type: none"> - [1130] Estuaries - [1140] Tidal Mudflats and Sandflats - [1310] Salicornia Mud - [1330] Atlantic Salt Meadows - [1410] Mediterranean Salt Meadows - [2120] Marram Dunes (White Dunes) - [2130] Fixed Dunes (Grey Dunes)* 	13.5km
Special Protection Areas (SPA)			
004006	North Bull Island SPA	<ul style="list-style-type: none"> - [A046] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [wintering] - [A048] Shelduck (<i>Tadorna tadorna</i>) [wintering] - [A052] Teal (<i>Anas crecca</i>) [wintering] - [A054] Pintail (<i>Anas acuta</i>) [wintering] - [A056] Shoveler (<i>Anas clypeata</i>) [wintering] - [A130] Oystercatcher (<i>Haematopus ostralegus</i>) [wintering] - [A140] Golden Plover (<i>Pluvialis apricaria</i>) [wintering] - [A141] Grey Plover (<i>Pluvialis squatarola</i>) [wintering] - [A143] Knot (<i>Calidris canutus</i>) [wintering] - [A144] Sanderling (<i>Calidris alba</i>) [wintering] - [A149] Dunlin (<i>Calidris alpina</i>) [wintering] - [A156] Black-tailed Godwit (<i>Limosa limosa</i>) [wintering] - [A157] Bar-tailed Godwit (<i>Limosa lapponica</i>) [wintering] - [A160] Curlew (<i>Numenius arquata</i>) [wintering] - [A162] Redshank (<i>Tringa totanus</i>) [wintering] - [A169] Turnstone (<i>Arenaria interpres</i>) [wintering] - [A179] Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [wintering] - [A999] Wetland and Waterbirds 	1.1km
004024	South Dublin Bay and River Tolka Estuary SPA	<ul style="list-style-type: none"> - [A046] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [wintering] - [A130] Oystercatcher (<i>Haematopus ostralegus</i>) [wintering] - [A137] Ringed Plover (<i>Charadrius hiaticula</i>) [wintering] - [A141] Grey Plover (<i>Pluvialis squatarola</i>) [wintering] - [A143] Knot (<i>Calidris canutus</i>) [wintering] - [A144] Sanderling (<i>Calidris alba</i>) [wintering] - [A149] Dunlin (<i>Calidris alpina</i>) [wintering] - [A157] Bar-tailed Godwit (<i>Limosa lapponica</i>) [wintering] - [A162] Redshank (<i>Tringa totanus</i>) [wintering] - [A179] Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [wintering] - [A192] Roseate Tern (<i>Sterna dougallii</i>) [passage] - [A193] Common Tern (<i>Sterna hirundo</i>) [breeding] [passage] 	1.3km

Site Code	Site Name	Qualifying Interests	Distance to Site
		<ul style="list-style-type: none"> - [A194] Arctic Tern (<i>Sterna paradisaea</i>) [breeding [passage] - [A999] Wetland and Waterbirds 	
004016	Baldoyle Bay SPA	<ul style="list-style-type: none"> - [A046] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [wintering] - [A048] Shelduck (<i>Tadorna tadorna</i>) [wintering] - [A137] Ringed Plover (<i>Charadrius hiaticula</i>) [wintering] - [A140] Golden Plover (<i>Pluvialis apricaria</i>) [wintering] - [A141] Grey Plover (<i>Pluvialis squatarola</i>) [wintering] - [A157] Bar-tailed Godwit (<i>Limosa lapponica</i>) [wintering] - [A999] Wetland and Waterbirds 	4.8km
004117	Ireland's Eye SPA	<ul style="list-style-type: none"> - [A017] Cormorant (<i>Phalacrocorax carbo</i>) [breeding] - [A184] Herring Gull (<i>Larus argentatus</i>) [breeding] - [A188] Kittiwake (<i>Rissa tridactyla</i>) [breeding] - [A199] Guillemot (<i>Uria aalge</i>) [breeding] - [A200] Razorbill (<i>Alca torda</i>) [breeding] 	8.4km
004025	Malahide Estuary SPA	<ul style="list-style-type: none"> - [A005] Great Crested Grebe (<i>Podiceps cristatus</i>) [wintering] - [A046] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [wintering] - [A048] Shelduck (<i>Tadorna tadorna</i>) [wintering] - [A054] Pintail (<i>Anas acuta</i>) [wintering] - [A067] Goldeneye (<i>Bucephala clangula</i>) [wintering] - [A069] Red-breasted Merganser (<i>Mergus serrator</i>) [wintering] - [A130] Oystercatcher (<i>Haematopus ostralegus</i>) [wintering] - [A140] Golden Plover (<i>Pluvialis apricaria</i>) [wintering] - [A141] Grey Plover (<i>Pluvialis squatarola</i>) [wintering] - [A143] Knot (<i>Calidris canutus</i>) [wintering] - [A149] Dunlin (<i>Calidris alpina</i>) [wintering] - [A156] Black-tailed Godwit (<i>Limosa limosa</i>) [wintering] - [A157] Bar-tailed Godwit (<i>Limosa lapponica</i>) [wintering] - [A162] Redshank (<i>Tringa totanus</i>) [wintering] - [A999] Wetland and Waterbirds 	8.5km
004113	Howth Head Coast SPA	<ul style="list-style-type: none"> - [A188] Kittiwake (<i>Rissa tridactyla</i>) [breeding] 	8.8km
004172	Dalkey Islands SPA	<ul style="list-style-type: none"> - [A192] Roseate Tern (<i>Sterna dougallii</i>) [passage] [breeding] - [A193] Common Tern (<i>Sterna hirundo</i>) [passage] [breeding] - [A194] Arctic Tern (<i>Sterna paradisaea</i>) [passage] [breeding] 	12km
004015	Rogerstown Estuary SPA	<ul style="list-style-type: none"> - [A043] Greylag Goose (<i>Anser anser</i>) [wintering] - [A046] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [wintering] 	13.7km

Site Code	Site Name	Qualifying Interests	Distance to Site
		<ul style="list-style-type: none"> - [A048] Shelduck (<i>Tadorna tadorna</i>) [wintering] [breeding] - [A056] Shoveler (<i>Anas clypeata</i>) [wintering] - [A130] Oystercatcher (<i>Haematopus ostralegus</i>) [wintering] - [A137] Ringed Plover (<i>Charadrius hiaticula</i>) [wintering] - [A141] Grey Plover (<i>Pluvialis squatarola</i>) [wintering] - [A143] Knot (<i>Calidris canutus</i>) [wintering] - [A149] Dunlin (<i>Calidris alpina</i>) [wintering] - [A156] Black-tailed Godwit (<i>Limosa limosa</i>) [wintering] [passage] - [A162] Redshank (<i>Tringa totanus</i>) [wintering] - [A999] Wetland and Waterbirds 	

5.4.2.2 Sites of National Importance

The basic designation for wildlife and habitats in Ireland is the Natural Heritage Area (NHA). These sites are comprised of 75 no. raised bogs and a further 73 no. blanket bogs. There are an additional 630 no. sites listed as proposed Natural Heritage Areas (pNHA). These are sites that were initially published on a non-statutory basis in 1995 but have yet to be statutorily proposed or designated. However, they do have certain levels of protection such as in the County Development Plans.

No NHAs are located within, or directly adjacent to, the Site of the Proposed Development. The nearest pNHA to the Proposed Development is the North Dublin Bay pNHA located ca.1.1km to the east. The Proposed Development maintains a hydrological connection with this pNHA via the Naniken Stream. As Such, North Dublin Bay pNHA is included in the precautionary Zone of Influence (ZOI) of the Proposed Development.

North Dublin Bay pNHA is designated as an SAC, and as such has no official pNHA Site Synopses attributed to it. This pNHA is therefore considered in this assessment in terms of the Qualifying interests (i.e., habitats and species) for which the North Dublin Bay SAC is designated. As such, potential impacts to this pNHA are addressed by proxy in the AA Screening and NIS reports that accompany this application under separate cover.

No other pNHAs are deemed to maintain potential impact pathways linking them to the Proposed Development.

Table 5-6 details the NHAs and pNHA within 5km of the site of the Proposed Development and summarises their qualifying interests, where available. There are six (6) no. pNHA within 5km of the site of the Proposed Development.

Table 5-6 Natural heritage areas and proposed natural heritage areas within 5km of the Site of the Proposed Development

Site Code	Site Name	Qualifying Interests	Distance to Site
Natural Heritage Areas (NHA)			
<i>There are no NHAs within 5km of the Proposed Development.</i>			
Proposed Natural Heritage Areas (pNHA)			
000206	North Dublin Bay	<i>There are no formal qualifying interests listed for proposed Natural Heritage Areas (pNHA). A general site synopsis is available for most sites on the NPWS website (NPWS, 2022).</i>	1.14km
000201	Dolphins, Dublin Docks		3.35km
000210	South Dublin Bay		3.52km
002103	Royal Canal		3.77km
000178	Santry Demesne		4.41km
000199	Baldoyle Bay		4.71km

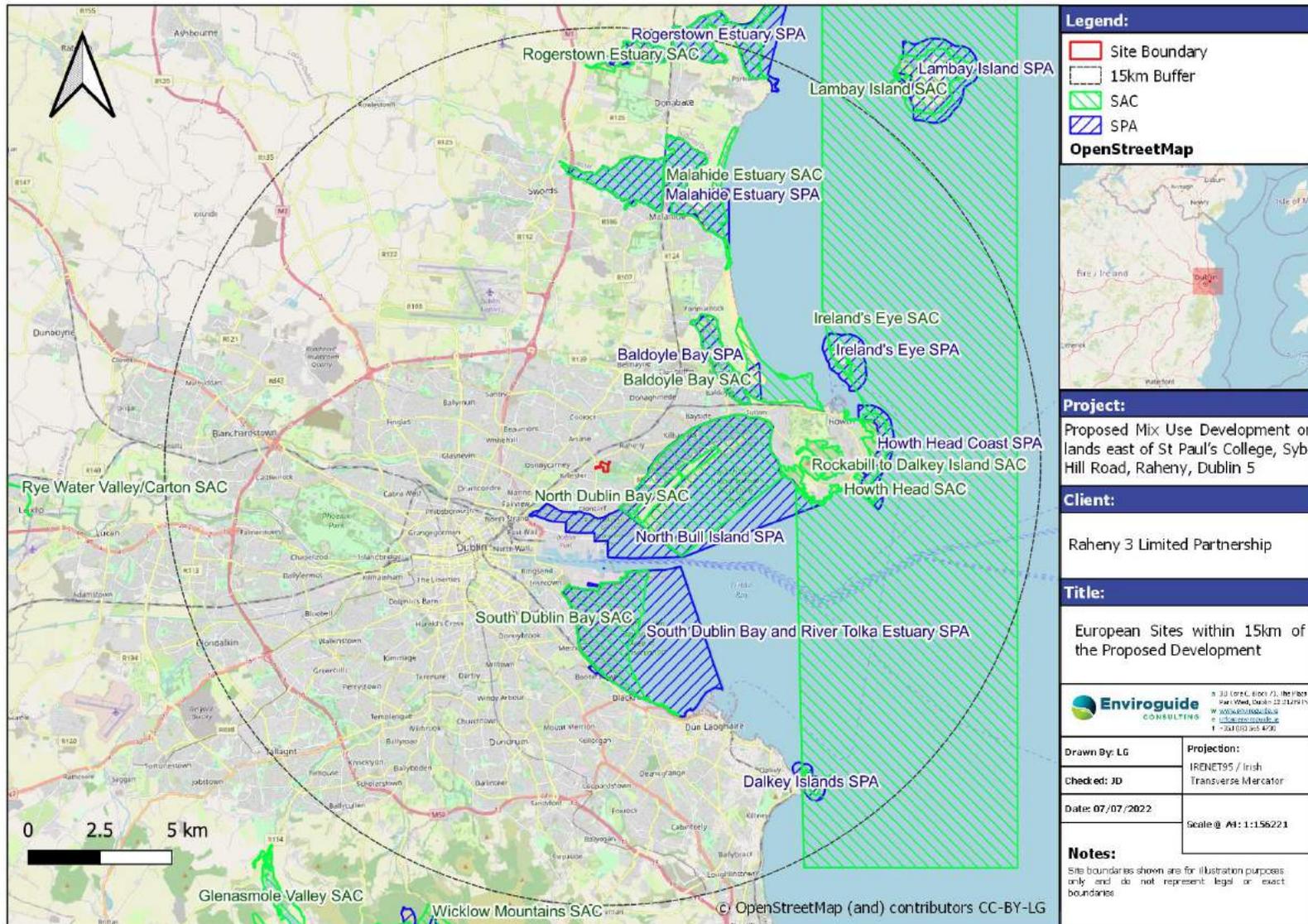


Figure 5-4 European Sites within 15km of the Proposed Development

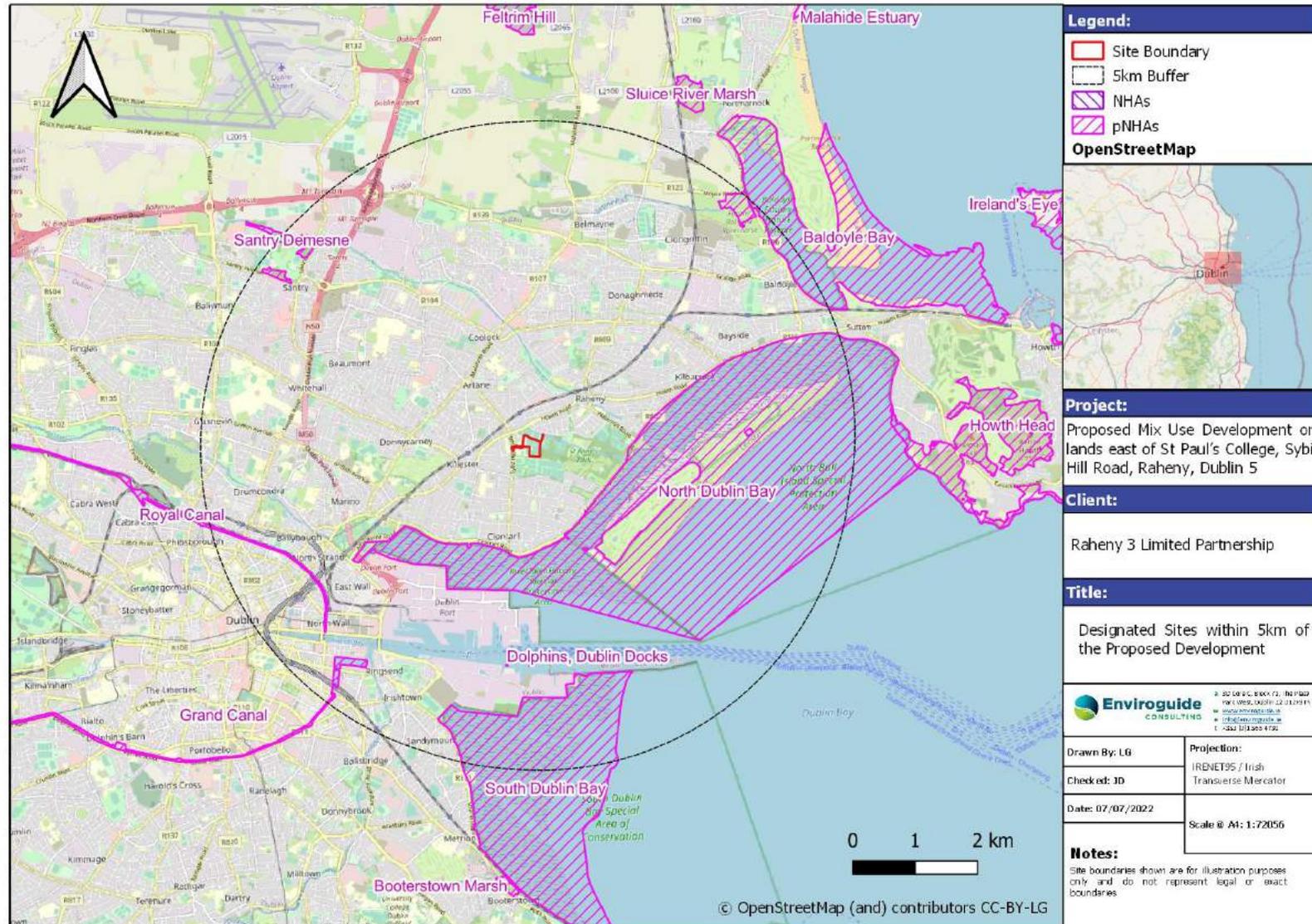


Figure 5-5 Designated Sites within 5km of the Proposed Development

5.4.3 Habitats

The habitats within the site of the Proposed Development were coded and categorised to level 3 according to Fossitt (2000). The following habitats were identified within the site of the Proposed Development and the immediate surrounding area:

- Buildings and Artificial Surfaces (BL3);
- Amenity Grassland (Improved) (GA2);
- Dry meadows and grassy verges (GS2);
- Scrub (WS1);
- Scattered Trees and Parkland (WD5);
- (Mixed) Broadleaved Woodland (WD1);
- Treelines (WL2);
- Drainage Ditch (FW4); and
- Stone Walls and Other Stonework (BL1).

See Figure 5-6 for the habitat map.



Figure 5-6. Habitat Map

5.4.3.1 Buildings and Artificial Surfaces (BL3)

Buildings and Artificial Surfaces habitat covers the existing site structures and areas of hardstanding. There is little to no vegetation present in these areas, and they are of negligible ecological value.

5.4.3.2 Amenity Grassland (Improved) (GA2)

Amenity Grassland (Improved) habitat covers the managed area of the playing pitch utilised by St Paul's College; this area is subject to regular mowing and is of negligible ecological value.

5.4.3.3 Dry Meadows and Grassy Verges (GS2)

This unmanaged habitat type makes up the majority of the Site groundcover in the form of rank grassland fields, formerly used as playing pitches without maintenance (i.e., mowing) since August 2018. The main sward comprises Yorkshire fog *Holcus lanatus*, cock's foot *Dactylis glomerata*, creeping bent *Agrostis stolonifera* and perennial ryegrass *Lolium perenne*. The herbaceous component is largely made up of creeping buttercup *Ranunculus repens*, meadow buttercup *Ranunculus acris*, nettle *Urtica dioica*, dandelion *Taraxacum officinale*, daisy *Bellis perennis*, ribwort plantain *Plantago lanceolata*, creeping thistle *Cirsium arvense*, Hogweed *Heracleum sphondylium*, broad-leaved dock *Rumex obtusifolius* and white clover *Trifolium repens*. In the shadier areas along the boundary and under trees species such as rape *Brassica napus*, garlic mustard *Alliaria petiolata*, cow parsley *Anthriscus sylvestris*, prickly sowthistle *Sonchus asper*, cleavers *Galium aparine* and field forget-me-not *Myosotis arvensis* were recorded. This habitat type is of some value to local insects and wildlife at the Site and is of Local importance (Lower value).

5.4.3.4 Scrub (WS1)

There is an area of dense scrub located in the north-west corner of the main grassland section of the Site. This scrub is dominated by thick bramble *Rubus fruticosus* agg., and elder *Sambucus nigra*, with nettle *Urtica dioica* and ivy *Hedera helix* also abundant. A section of Griselenia hedgerow has become part of the scrub. Garlic mustard *Alliaria petiolata*, cleavers *Galium aparine* and silverweed *Potentilla anserina* were recorded along the scrub margins. Patches of this habitat are forming in various parts of the rank grassland meadow, with bramble and elder both present. This habitat forms a dense habitat for wildlife such as local birds and mammals and is of Local importance (Higher value).

5.4.3.5 Scattered Trees and Parkland (WD5)

There are several parcels of *scattered trees and parkland* habitat within the Site of the Proposed Development and surrounding area; along the north-western boundary of the main area of rank grassland. There are also areas north of St Paul's College, within the grounds of the Vincentian Community Residence. Common trees recorded within the northwest of the Site include horse chestnut *Aesculus hippocastanum*, Austrian Pine *Pinus nigra*, sycamore *Acer pseudoplatanus* and lime *Tilia europea*. This habitat provides potential bat roosting habitat due to the age and condition of the trees present. This habitat is considered of Local importance (Higher value).

5.4.3.6 (Mixed) Broadleaved Woodland (WD1)

A strip of mixed broadleaved woodland forms the northern boundary of the site of the Proposed Development. There are additional parcels located within the grounds of the Vincentian Community Residence. The northern woodland is largely comprised of sycamore *Acer pseudoplatanus*, and ash *Fraxinus excelsior*. This northern strip of WD1 habitat is located outside the redline boundary of the Site and is separated by a steep drainage ditch. This habitat is therefore retained in the project design and impacts are not envisaged bar the removal of several trees located south of the aforementioned ditch and close to the northern Site boundary i.e., Trees BA & BB as per the Arboricultural Report and Tree impacts Plan (Treefile, 2022). This habitat forms part of a wider wildlife corridor system running north and east through St Anne's Park providing habitat connectivity with the rest of the park. This habitat is considered of Local importance (Higher value).

5.4.3.7 Treelines (WL2)

Treelines comprising mature trees form the eastern and southern boundaries of the Site of the Proposed Development. There are numerous other mature treelines present within St Anne's Park and the surrounding area. Regularly occurring species included holm oak *Quercus ilex*, lime *Tilia europea*, ash *Fraxinus excelsior*, bramble *Rubus fruticosus* agg., elder *Sambucus nigra*, Austrian pine *Pinus nigra* and Monterey pine *Pinus radiata*. Ivy *Hedera helix* is the dominant ground cover in these areas. This habitat also forms part of a wider wildlife corridor system running through St Anne's Park; providing important habitat connectivity. This habitat is considered of Local importance (Higher value).

5.4.3.8 Drainage Ditch (FW4)

There is a short drainage ditch within the grounds of Sybil Hill House. This ditch was slightly wet underfoot but with no actual standing water present. Species present within the ditch included silverweed *Potentilla anserina*, creeping cinquefoil *Potentilla reptans*, meadow buttercup *Ranunculus acris*, germander speedwell *Veronica chamaedrys*, daisy *Bellis perennis* and dandelion *Taraxacum officinale* agg. A second longer drainage ditch is present adjacent to the northern boundary of the Site of the Proposed Development. This ditch is c. 0.5-1.0m in width and was wet in parts during the site visits although it dried out along the eastern reaches. This ditch contained some discarded refuse along its length. Due to its relatively dry state overall and lack of aquatic vegetation, this habitat is considered of Local importance (lower value).

5.4.3.9 Stone Walls and Other Stonework (BL1)

An old brick wall is present beyond the northern boundary of the site of the Proposed Development. While there is little or no vegetation on the surface of the wall itself, there are a number of species present at the base including black medick *Medicago lupulina*, common ramping-fumitory *Fumaria muralis*, scarlet pimpernel *Anagallis arvensis*, common vetch *Vicia sativa* ssp. and winter heliotrope *Petasites fragrans*. This habitat is considered of Local importance (Higher value) due to its age and some bat roost potential in cracks and crevices.

5.4.4 Flora and Fauna

The Site of the Proposed Development is located within the Ordnance Survey National Grid 10km grid square O23, the 2km grid square O23D and the 1km grid square O2037. Species records from the last 30 years from the National Biodiversity Data Centre (NBDC) online

database for these grid squares were studied for the presence of rare/protected/invasive flora and fauna species.

5.4.4.1 Rare and Protected Flora

Ten records of rare flora, e.g., those classified as 'critically endangered', 'endangered', or 'vulnerable' on the *Ireland Red List No. 10: Vascular Plants* (Wyse-Jackson *et al.*, 2016) or the *Ireland Red List No. 8: Bryophytes* (Lockhart *et al.*, 2012), were identified during a review of the relevant grid squares using the NBDC database. No rare species of flora were recorded during site visits. Lesser Centaury *Centaureum pulchellum* was recorded at a location along the southeast shore of Bull Island in 2010, however, this coastal species is unlikely to be found at the Site of the Proposed Development.

The Site does not contain any species listed on the Flora (Protection) Order 2015 (FPO). A search of the NPWS FPO Bryophyte Map Viewer provided no records of protected species within the vicinity of the Site of the Proposed Development, with the nearest records located on Bull Island to the east (Petalwort, Cernuous Thread-moss, Many-seasoned Thread-moss & Warne's Thread-moss).

Table 5-7 Records of Rare or Protected Flora for the Surrounding 10KM (O23) Grid Square, from the NBDC.

Name	Species Group	Date of last record	Database	Designation
Petalwort (<i>Petalophyllum ralfsii</i>)	Liverwort	11/06/2009	Bryophytes of Ireland	EU Habitats Directive: Annex II; Flora Protection Order 2015 (Schedule C); Red List 2012: Least concern
Cernuous Thread-moss (<i>Bryum uliginosum</i>)	Moss	03/10/2008	Bryophytes of Ireland	Flora Protection Order 2015 (Schedule B); Red List 2012: Endangered
Many-seasoned Thread-moss (<i>Bryum intermedium</i>)	Moss	14/09/2007	Bryophytes of Ireland	Flora Protection Order 2015 (Schedule B); Red List 2012: Endangered
Warne's Thread-moss (<i>Bryum warneum</i>)	Moss	14/09/2007	Bryophytes of Ireland	Flora Protection Order 2015 (Schedule B); Red List 2012: Endangered
Shady Beard-moss (<i>Didymodon umbrosus</i>)	Moss	17/11/2004	Bryophytes of Ireland	Red List 2012: Vulnerable
Lesser Centaury (<i>Centaureum pulchellum</i>)	Flowering plant	31/12/2010	BSBI tetrad data for Ireland	Flora Protection Order 2015 (Schedule A); Red List 2016: Near Threatened
Little-robin (<i>Geranium purpureum</i>)	Flowering plant	24/05/2014	Ireland's BioBlitz	Red List 2016: Endangered
Wild Clary (<i>Salvia verbenaca</i>)	Flowering plant	01/08/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Red List 2016: Vulnerable
Spring Vetch (<i>Vicia lathyroides</i>)	Flowering plant	07/05/2019	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Red List 2016: Vulnerable
Bird's-foot (<i>Ornithopus perpusillus</i>)	Flowering plant	18/08/2020	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Red List 2016: Vulnerable

5.4.4.2 Invasive Flora

There are records from the NBDC database for 9 no. species of flora considered to be invasive within the 2km grid square (O23D) within which the site of the Proposed Development is located. The 2km grid resolution is somewhat more relevant than invasive plant species

recorded within 10km of the Site, and is used to give a more focused account of invasive flora in the vicinity of the Site. Details of these records are detailed in Table 5-8.

The site of the Proposed Development contains a number of these non-native species, none of which are listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations 2011*. The following invasive non-native flora were observed within the vicinity of the Site:

- Himalayan Honeysuckle *Leycesteria formosa* (Medium Impact³)
- Sycamore *Acer pseudoplatanus* (Medium Impact)
- Holm oak *Quercus Ilex* (Medium Impact)
- Winter Heliotrope *Petasites pyrenaicus* (Low impact)

Winter Heliotrope *Parasites pyrenaicus* was found at the base of the wall running along the northern boundary of the Site. Holm oak and Sycamore found along the wooded margins of the Site. One instance of Himalayan Honeysuckle *Leycesteria formosa* was noted within the northern woodland strip outside of the Site's boundary.

³ Impact status based on the 2013 Invasive Species in Ireland risk assessment. See report: Kelly, J., O'Flynn, C., and Maguire, C. 2013. Risk analysis and prioritisation for invasive and non-native species in Ireland and Northern Ireland. <http://invasivespeciesireland.com/wp-content/uploads/2013/03/Risk-analysis-andprioritization-29032012-FINAL.pdf>

Table 5-8 Records of Invasive Species of Flowering Plant from the relevant 2KM Grid Square (O23D) from the NBDC

Species	Date of last record	Source	Designations
Butterfly-bush (<i>Buddleja davidii</i>)	08/06/2013	Online Atlas of Vascular Plants 2012-2020; Local BioBlitz Challenge 2013	- Medium Impact Invasive Species
Cherry Laurel (<i>Prunus laurocerasus</i>)	08/06/2013	Local BioBlitz Challenge 2013	- High Impact Invasive Species
Holm Oak (<i>Quercus ilex</i>)	07/05/2020	Local BioBlitz Challenge 2013	- Medium Impact Invasive Species
Himalayan Honeysuckle (<i>Leycesteria formosa</i>)	08/06/2013	Local BioBlitz Challenge 2013	- Medium Impact Invasive Species
Japanese Knotweed (<i>Fallopia japonica</i>)	08/06/2013	National Invasive Species Database; Local BioBlitz Challenge 2013	- High Impact Invasive Species - Regulation S.I. 477
Japanese Rose (<i>Rosa rugosa</i>)	24/09/2018	Online Atlas of Vascular Plants 2012-2020	- Medium Impact Invasive Species
Sycamore (<i>Acer pseudoplatanus</i>)	26/08/2016	Online Atlas of Vascular Plants 2012-2020	- Medium Impact Invasive Species
Three-cornered Garlic (<i>Allium triquetrum</i>)	03/05/2015	Online Atlas of Vascular Plants 2012-2020	- Medium Impact Invasive Species - Regulation S.I. 477
Turkey Oak (<i>Quercus cerris</i>)	08/06/2013	Local BioBlitz Challenge 2013	- Medium Impact Invasive Species

5.4.4.3 Mammals (excl. bats)

Records for terrestrial mammals recorded in the surrounding 2km grid square were retrieved from the NBDC online database. The following protected species were included in these results:

- Eurasian Badger (*Meles meles*)
- Eurasian Pygmy Shrew (*Sorex minutus*)
- Western European Hedgehog (*Erinaceus europeaus*)
- Red Squirrel (*Sciurus vulgaris*)

Additional commonly occurring protected mammal species were also considered in the context of the Site of the Proposed Development and its environs.

5.4.4.3.1 Eurasian Badger

Badgers are a protected species under the Wildlife Act 1976 as amended and are listed in Appendix III of the Bern Convention. It is an offence to intentionally cause harm or wilfully interfere with an active or inactive breeding or resting place of a protected wild animal.

Evidence of Badger was recorded in the north-western corner of the Site, during the mammal survey in December 2021. A large earthen mound, covered in mature elder and dense bramble scrub is present in this corner of the Site, running east-west; likely a result of previous clearance of the lands in the past. Several established mammal trails were noted leading into this scrub from the Site lands, and evidence of mammal scuffle marks and digging were present.

On the northern side of this mound (midway along) three large burrow entrances were noted in close proximity to each other, with large spoil heaps outside with discarded bedding observed. Badger prints were observed in the wet earth at these entrances. These large entrances were confirmed by Brian Keeley during July 2022 surveys to represent a badger main sett (due to the size and nature of the spoil heaps present, discarded bedding etc.). Trail camera footage (under licence from NPWS) recorded the presence of 5 badgers utilising the main sett; two adults and three weaned cubs, confirming it as a breeding sett for 2022.

Further along the mound from the main sett, at the north-westernmost point, four smaller burrow entrances were recorded in close proximity to each other; one at the base of a tree and three in the side of the earth mound. These burrows were confirmed by Brian Keeley to be entrances to an annexe badger sett linked by establish trails to the main sett.

No latrines were visible within the vicinity of the entrances although lead litter was abundant and may have disguised them if present. Mammal trails were noted throughout, and leading from this area, under the metal fencing and into the wooded margin of St Anne's Park.

On the southern side (Site-side) of the mound, amidst dense bramble scrub, two smaller entrances were noted with potential discarded grass bedding nearby. More potentially discarded dry grass bedding was found piled at the base of the slope, underneath the canopy of a Griselenia hedge.

5.4.4.3.2 Red Fox

Red Fox has been observed at the Site on multiple occasions, with a fox observed in a 2019 Enviroguide Mammal survey entering the north-western scrub, and several heard calling during a bat survey of the Site in the same year. A fox was observed visually and calling during the bat survey on 26th July 2022 and was also recorded in the vicinity of the main sett on trail camera footage in 2022. No dens were recorded at the Site, although foxes will inhabit occupied setts with badgers in some instances. Foxes are not a protected species in Ireland, partly due to their apparent success in urban environments, but as our only wild canid they should be considered as best practice in terms of avoiding direct harm.

5.4.4.3.3 Small Mammals

Western European Hedgehog and Pygmy Shrew have potential to utilise the Site lands in their current condition. These small, relatively widespread species inhabit both urban and rural landscapes, and likely inhabit the Site and St. Anne's Park due to the presence of suitable habitats therein, although no signs or evidence was recorded during site visits.

Red Squirrel is limited to more rural parts of the country with higher tree cover e.g., woodland, commercial forestry plantations etc., (Lawton et al., 2020), however, this species has been recorded in St. Anne's Park as recently as 2007 (NBDC record: The Irish Squirrel Survey 2007). The Site itself provides limited habitat potential for Red Squirrel in its current state.

Little to no suitable habitat for Irish Stoat *Mustela erminea hibernica* and Pine Marten *Martes* exists at the Site. Irish stoat have been recorded on Bull Island as recently as 2017, while a Pine Marten was recorded in south Baldoyle bay in 2013 (NBDC, 2021). These species could potential be found in St. Anne's Park but the Site of the Proposed Development would not support significant habitat for either species.

Irish mountain hare *Lepus timidus hibernicus* are not likely to be present at the Site and no signs e.g., droppings were noted during site surveys.

5.4.4.3.4 Otter

It is deemed that Otter *Lutra lutra* would not utilise the Site of the Proposed Development due to the lack of suitable habitat for this species within the Site itself and its immediate surroundings.

5.4.4.4 Bats

In view of their sensitive status across Europe, all species of bat have been listed on Annex IV of the EC 'Habitats and Species Directive'. One other species, the Lesser Horseshoe bat is given further protection and listed on Annex II of this Directive. However, this species is only found in the west of Ireland. All bat species are protected under the Wildlife Act 1976 to 2012 (the **Wildlife Acts**) which make it an offence to wilfully interfere with or destroy the breeding or resting place of these species; however, the Wildlife Acts permit limited exemptions for certain kinds of development.

5.4.4.4.1 Activity and Emergence Surveys

Surveys undertaken by Enviroguide Consulting picked up frequencies between 10 kHz - 192 kHz, this frequency range is able to pick up the calls of Irish bat species, including Lesser horseshoe bats. The bat detector used was the Elekon Bat Logger M2. Visual observations were taken with the aid of two powerful L.E.D. torch (AP Pros-Series 220 Lumens High Performance Spotlights).

The following bat species were recorded within the site of the Proposed Development and immediate surrounding area during dusk transect activity surveys undertaken in 2021 and 2022:

- Common Pipistrelle *Pipistrellus*;
- Soprano Pipistrelle *Pipistrellus pygmaeus*;
- Nathusius's Pipistrelle *Pipistrellus nathusii*;
- Leisler's Bat *Nyctalus leisleri*; and
- Brown Long-eared Bat *Plecotus auritus*.

7th of September 2021

The dusk bat activity survey conducted on the 7th of September 2021 focussed on the treeline habitats bounding the north, east and south of the Site. Three bat species were recorded: Leisler's Bat (*Nyctalus leisleri*), Common Pipistrelle (*Pipistrellus pipistrellus*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*). Leisler's Bat was the most common bat species and accounted for 63% (24) of all records followed by Soprano Pipistrelle at 21% (8) and Common Pipistrelle at 16% (6).

The treelines running along the Site's boundaries represent moderate-high value foraging and commuting habitat within the context of the Site and St. Anne's Park. There were several records of Leisler's bat foraging activity along the treeline to the north with emitted calls being consistent with foraging activity above treelines (as per Russ, 2012). In addition, Soprano Pipistrelle were recorded emitting "feeding buzzes" (rapid calls emitted before capturing prey) along the treelines to the north and east at 7:28pm and 7:32pm respectively. Over the course of the survey all bat species were recorded commuting along the boundary treelines along the north, east and south of the Site.

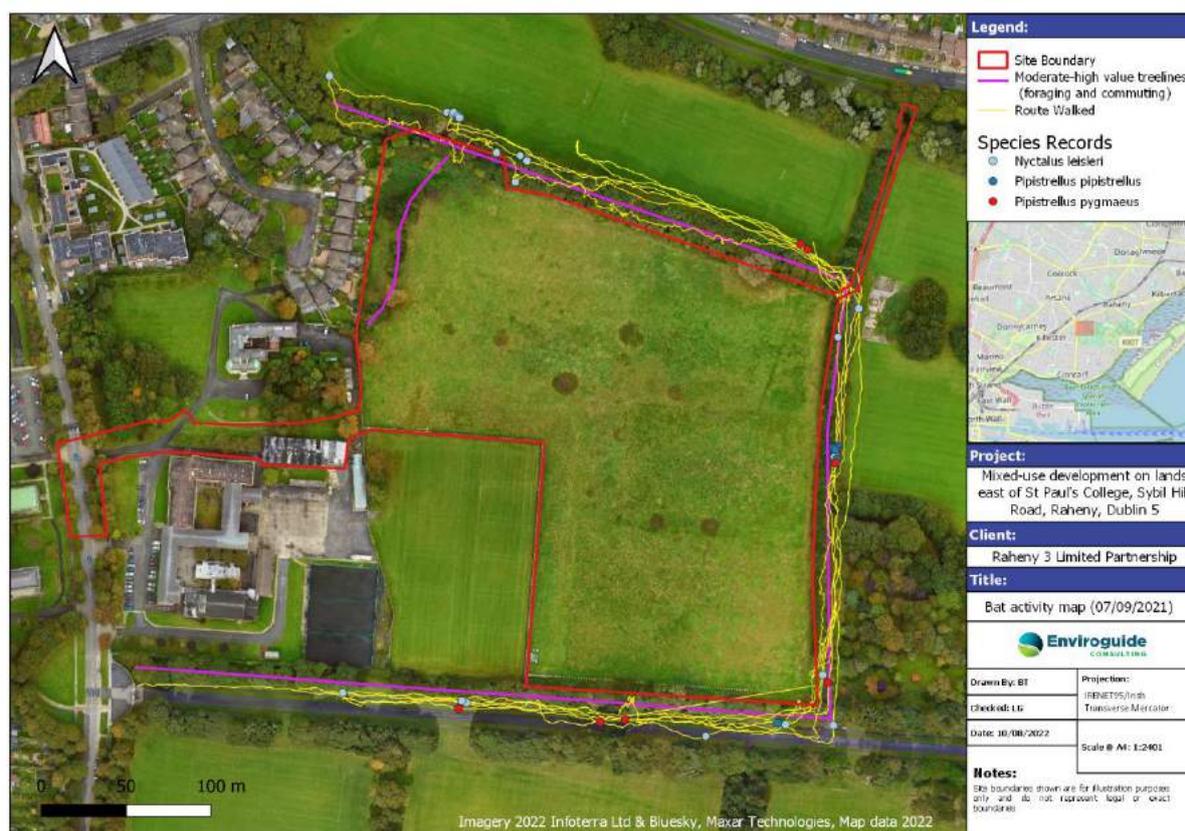


Figure 5-7 Results of September 2021 dusk activity survey.

26th of July 2022

No bats were observed emerging from either the prefab structure or the mature Horse Chestnut tree (tree tag 38) during the emergence surveys conducted on 26th July 2022. It was noted that the prefab structure is well lit by external flood lights located on the adjacent school buildings, with the south-western corner containing the damaged section located below one such light.

Although no emergence was recorded, both the prefab and tree 38 provide moderate – high roosting potential due to their supporting multiple PBR features and their location near to mature trees and suitable habitat.

A total of 5 bat species were encountered during the dusk activity survey conducted on the 26th of July 2022: Leisler's Bat (*Nyctalus leisleri*), Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), Nathusius's Pipistrelle (*Pipistrellus nathusii*) and

Brown long-eared Bat (*Plecotus auritus*). An unidentified pipistrelle species was also recorded. Both Common Pipistrelle and Leisler's bat were the more common species detected, accounting for 46% and 38% of records respectively. The majority of activity occurred near the trees and buildings to the west of the Site. The majority of species recorded were utilising these habitats to commute across the Site. Although no "feeding buzzes" were noted in the recordings, it is likely that that bat species utilise these habitats for commuting and foraging for prey.

An elevated level of bat activity was recorded around a mature horse chestnut (Tree tag 38) in the west of the Site; with 16 Common Pipistrelle passes, 1 Nathusius's Pipistrelle pass, 1 Soprano Pipistrelle pass and 1 Leisler's bat pass detected between 21:46pm and 22:00pm. However, no bats were observed emerging from this tree during the emergence survey carried out from 21:20 to 22:00, despite the presence of surface openings/hollows in the tree trunk. Analysis of the bat calls recorded at this tree were mostly indicative of bats commuting past the tree, which aligns with the few visual observations that were made of bats commuting past due west. However, this tree does hold moderate-high bat roost potential and may support roosting bats in the future.

A single recorded of a Brown Long-eared bat was detected at 21:37pm commuting across open ground in the north-west of the Site. Leisler's Bat and Common Pipistrelle were also observed commuting along the boundary treelines to the north, east and south of the Site.

Table 5-9 Summary of bat activity recorded on 7th of September 2021 and the 26th of July 2022. (Non bat "noise" records removed).

Survey	Species (Scientific name)	Species (Common name)	Number of recordings	Number of Calls
7 th of September 2021	<i>Nyctalus leisleri</i>	Leisler's Bat	24	141
	<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	8	239
	<i>Pipistrellus</i>	Common Pipistrelle	6	92
26 th of July 2022	<i>Nyctalus leisleri</i>	Leisler's Bat	20	71
	<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	4	48
	<i>Pipistrellus</i>	Common Pipistrelle	24	451
	<i>Pipistrellus nathusii</i>	Nathusius's Pipistrelle	1	29
	<i>Plecotus auritus</i>	Brown Long-eared Bat	1	6
	<i>Pipistrellus spec.</i>	Pipistrelle Sp.	2	48

Full survey metadata for the 2021 and 2022 surveys is attached in Appendix G.

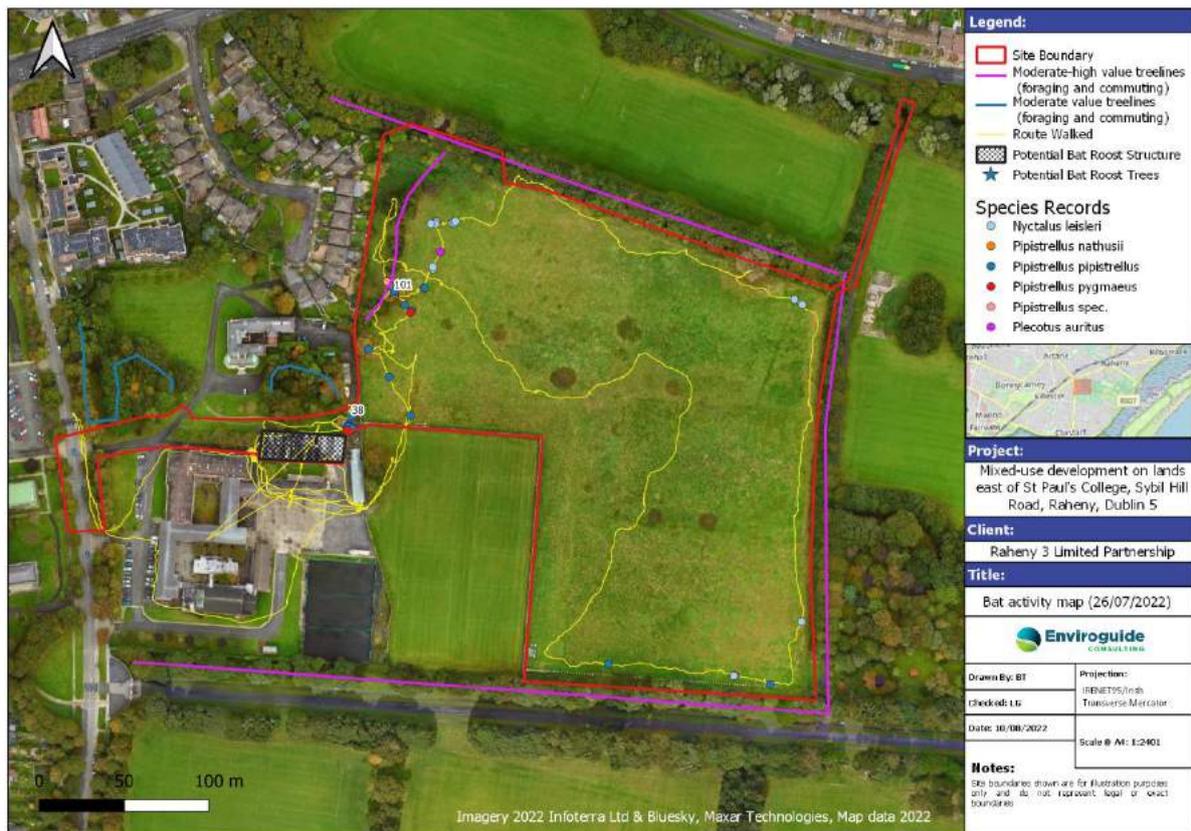


Figure 5-8 Results of July 2022 dusk activity survey and PBR/ bat habitat survey.

5.4.4.4.2 Roost inspection Surveys

No evidence of roosting bats (e.g. live/dead specimens, droppings, urine splashes and fur-oil stains) were found at the building (prefab classroom) located within the Site of the Proposed Development during the roost inspection surveys undertaken in 2019 and 2022.

Some trees located within the site of the Proposed Development were identified as having features with the potential to support roosting bats (e.g., splits, knots, flaking bark and cracked branches). Of particular note is a set of trees in the north-west of the Site which comprise mature trees, some with visible potential bat roost features (Within tree group 100-118).

Pre-fab structure

The pre-fab structure supported a number of PBR features along its western, northern and southern sides that could feasibly be used by bats to enter and exit the building. These comprised of damage to fascia boards, gaps in the eaves, and an ajar window along its northern side. No signs of bat usage were noted at these features from ground level except for one large hole in the corner cladding of the building's south-western corner; where insect remains and potential claw marks, both possibly caused by bats, were observed (See Figure 5-12). This area was observed during the emergence survey but no bat emergence or activity was recorded. The surveyor noted that a floodlight illuminated this feature well at night (See Figure 5-13).

The internal PBR inspection showed that the eastern side of the prefab is largely in good condition with only one PBR feature noted; an askew ceiling panel providing access to the

roof cavity (See Figure 5-10). The western side of the prefab was largely inaccessible and sealed off and could not be surveyed in detail, however, a precautionary pre-demolition assessment of the entire structure by a bat specialist is recommended to address this.



Figure 5-9 Examples of PBR features observed at the prefab structure.



Figure 5-10 Left-right: Example of interior of prefab structure and PBR feature in the ceiling of the hallway.



Figure 5-11 Images of the western side of the pre-fab which was inaccessible on the day of survey.



Figure 5-12 Images of the damage to pre-fab structure's south-western corner. Left-right: The damage, potential claw marks (Yellow) & insect remains at the base of the hole (Red).



Figure 5-13. PBR feature at south-western corner of prefab was well lit by floodlighting during the emergence survey.

Trees

The daytime PBR assessment of the Site focused on the trees proposed to be felled as part of the Proposed Development, as per the Arborist Report and Tree Constraints Plan (The Tree File, 2022) (See Table 5-10).

No confirmed bat roosts were noted during surveys on 26th July 2022. Two trees proposed to be felled were noted as having moderate-high bat roost potential; Chestnut trees tagged 38 and 101.

The majority of the trees to be felled provide some form of linear vegetation for bats to commute and forage along. Those in the far west of the Site are more fragmented and less suitable due to proximity to the road and are thus assigned low-moderate commuting/foraging suitability. Trees located within the north-western section of the Site itself and the wooded boundaries of the Site are assigned moderate-high suitability, due to their continuity, broadleaf component and connectivity with the habitats of St. Anne's Park. These features were noted to be utilised by foraging/commuting bats during the dusk activity survey.

The trees assigned as having Moderate-High bat roost potential are highlighted in orange in Table 5-10 for reference. All trees within the north-western section of the Site (Tree tags 38-118) will be subject to a pre-felling bat survey carried out by a suitably qualified bat specialist, the night/morning before felling. This may require several surveys depending on the felling schedule/ bat specialist's judgement.

The trees noted as having moderate-high bat roost potential and highlighted in orange in the table below (Tree tags 38 & 101) will be felled using a particular soft-felling approach and under the supervision of a bat specialist, as detailed in the mitigation section 5.7.3. This will also apply to any further trees the bat specialist identifies in their pre-felling survey as requiring

this approach. Figure 5-8 should be consulted along with the Arborist report and drawings to ensure correct felling takes place and potential harm to roosting bats is avoided if present.

Table 5-10 Bat roost potential and commuting/foraging suitability of the trees marked for felling as part of the Proposed Development.

Arborist Tree Number	Effect as part of the Proposed Development	Tree Species	Roost Suitability	Commuting/ Foraging suitability	Notes
Tree line 2	Remove ca. 1/3 of close-knit tree line	Leyland Cypress (<i>Cupressocyparis leylandii</i>)	Negligible	Moderate	Dense conifer treeline. No BPR features. Habitat connected to woodland area.
63	Remove	Lawson Cypress (<i>Chamaecyparis lawsoniana</i>)	Negligible	Moderate	No BPR features. Part of treeline with connectivity to other treelines.
64	Remove	Silver Birch (<i>Betula pendula</i>)	Negligible	Moderate	No BPR features. Part of treeline with connectivity to other treelines .
65	Remove	Lawson Cypress (<i>Chamaecyparis lawsoniana</i>)	Negligible	Moderate	No BPR features. Part of treeline with connectivity to other treelines.
I	Remove	Norway Maple (<i>Acer platanoides</i>)	Negligible	Low	No BPR features. Planted along the road.
22-28	Remove	Ornamental Cherry (<i>Prunus variety</i>)	Negligible	Low	No BPR features. Isolated treeline in close proximity to the school building.
199	Remove	Norway Maple (<i>Acer platanoides</i>)	Negligible	Low	No BPR features. Planted ornamental along access road.
200	Remove	Purple Plum (<i>Prunus cerasifera</i>)	Negligible	Low	No BPR features. Planted ornamental along access road.
34	Remove	Ornamental Cherry (<i>Prunus variety</i>)	Negligible	Moderate	No BPR features. Habitat connected to woodland area .
35	Remove	Ash (<i>Fraxinus excelsior</i>)	Negligible	Moderate	No BPR features. Habitat connected to woodland area.
66	Remove	Lawson Cypress	Negligible	Moderate	No BPR features. Part of treeline with

		<i>(Chamaecyparis lawsoniana)</i>			connectivity to other treelines.
38	Remove	Horse Chestnut <i>(Aesculus hippocastanum)</i>	Moderate-high	Moderate	Mature tree with two notable holes in trunk at height. Habitat connected to wider site.
99	Remove	Sycamore <i>(Acer pseudoplatanus)</i>	Negligible	Moderate - high	No BPR features. Part of mature treeline and connected to surrounding landscape
100	Remove	Lime <i>(Tilia europea)</i>	Negligible	Moderate - high	No BPR features. Part of mature treeline and connected to surrounding landscape.
101	Remove	Horse Chestnut <i>(Aesculus hippocastanum)</i>	Moderate-high	Moderate - high	Mature tree with hole visible half way up trunk. Part of mature treeline and connected to surrounding landscape.
102	Remove	Sycamore <i>(Acer pseudoplatanus)</i>	Low	Moderate - high	No BPR features but of mature age and size. Part of mature treeline and connected to surrounding landscape.
103	Remove	Sycamore <i>(Acer pseudoplatanus)</i>	Negligible	Moderate - high	No BPR features. Part of mature treeline and connected to surrounding landscape.
104	Remove	Sycamore <i>(Acer pseudoplatanus)</i>	Low	Moderate - high	No BPR features but of mature age and size. Part of mature treeline and connected to surrounding landscape.
108	Remove	Austrian Pine <i>(Pinus nigra)</i>	Negligible	Moderate - high	No BPR features. Part of mature treeline and connected to

					surrounding landscape.
111	Remove	Austrian Pine (<i>Pinus nigra</i>)	Negligible	Moderate - high	No BPR features. Part of mature treeline and connected to surrounding landscape.
112	Remove	Lodgepole Pine (<i>Pinus contorta</i>)	Negligible	Moderate - high	No BPR features. Part of mature treeline and connected to surrounding landscape.
113	Remove	Sycamore (<i>Acer pseudoplatanus</i>)	Negligible	Moderate - high	No BPR features. Part of mature treeline and connected to surrounding landscape.
114	Remove	Sycamore (<i>Acer pseudoplatanus</i>)	Low	Moderate - high	Some damage present – split visible. Part of mature treeline and connected to surrounding landscape.
115	Remove	Lime (<i>Tilia europea</i>)	Negligible	Moderate - high	No BPR features. Part of mature treeline and connected to surrounding landscape.
116	Remove	Austrian Pine (<i>Pinus nigra</i>)	Negligible	Moderate - high	No BPR features. Part of mature treeline and connected to surrounding landscape.
117	Remove	Austrian Pine (<i>Pinus nigra</i>)	Negligible	Moderate - high	No BPR features. Part of mature treeline and connected to surrounding landscape.
118	Remove	Lodgepole Pine (<i>Pinus contorta</i>)	Negligible	Moderate - high	No BPR features. Part of mature treeline and connected to surrounding landscape.

5.4.4.5 Breeding Birds

Breeding bird surveys were carried out at the Site of the Proposed Development on the 1st of March 2019, 30th April 2019, 27th May 2019, 25th of May 2021 and 30th of July 2021.

The bird species recorded during these surveys between 2019 and 2021 are shown in Table 5-11. Additional species recorded during other site visits are included where applicable.

A total of 31 species were identified within the vicinity of the Site of the Proposed Development; with 30 species in 2019 and 25 species recorded in 2021. These were either associated with the treelines and hedgerows that run along the Site boundaries or observed foraging across the Site lands.

Red-listed Bird Species

One species listed on the BoCCI⁴ Red List; Swift, was recorded at the Site of the Proposed Development during the 2019 surveys. This species was flying over the Site and not deemed to be breeding on site.

Amber-listed Bird Species

Seven species which are on the current BoCCI Amber List were recorded during the surveys.

- House Martin
- Swallow
- Starling
- Goldcrest
- Linnet
- Herring Gull
- Lesser Black-backed Gull

During the December 2021 site visit two additional species were noted:

- Jay *Garrulus glandarius* (**Green** listed) - Along northern boundary.
- Buzzard *Buteo buteo* (**Green** listed) – Hunting across Site.

⁴ Birds of Conservation Concern in Ireland 2020-2026 (Gilbert, Stanbury and Lewis, 2021).

Table 5-11. Bird species recorded within the vicinity of the Site during the breeding bird surveys in 2019 & 2021.

Species	BoCCI Status	EU Designation	Notes
Goldcrest (<i>Regulus regulus</i>)	Amber	N/A	In song in suitable habitat
Herring Gull (<i>Larus argentatus</i>)	Amber	Annex II Birds Directive	Flyover only
Lesser Black-backed Gull (<i>Larus fuscus</i>)	Amber	Annex II Birds Directive	Flyover only
Wren (<i>Troglodytes troglodytes</i>)	Green	N/A	In song in suitable habitat largely noted in southwestern corner of Site
Robin (<i>Erithacus rubecula</i>)	Green	N/A	In song in suitable habitat largely noted in southwestern corner of Site
Dunnock (<i>Prunella modularis</i>)	Green	N/A	In song in suitable habitat largely noted in southwestern corner of Site
Coal Tit (<i>Periparus ater</i>)	Green	N/A	Two in southern section
Blue Tit (<i>Cyanistes caeruleus</i>)	Green	N/A	Carrying food for young, noted in southwestern corner of Site
Great Tit (<i>Parus major</i>)	Green	N/A	Several recorded throughout the site
Long-tailed tit (<i>Aegithalus caudatus</i>)	Green	N/A	In song in suitable habitat
Chaffinch (<i>Fringilla coelebs</i>)	Green	N/A	In song in suitable habitat
Goldfinch (<i>Carduelis carduelis</i>)	Green	N/A	Present in suitable habitat
Greenfinch (<i>Chloris</i>)	Green	N/A	In song in suitable habitat
Blackbird (<i>Turdus merula</i>)	Green	N/A	Several recorded throughout the site
Mistle Thrush (<i>Turdus viscivorus</i>)	Green	N/A	Pair recorded along the northern section of site
Song Thrush (<i>Turdus philomelos</i>)	Green	N/A	Two recorded, along eastern and northern sections
Blackcap (<i>Sylvia atricapilla</i>)	Green	N/A	One heard along boundary
Linnet (<i>Linaria cannabina</i>)	Amber	N/A	Small party of birds feeding on site
Jackdaw (<i>Coloeus monedula</i>)	Green	N/A	Common

Species	BoCCI Status	EU Designation	Notes
Rook (<i>Corvus frugilegus</i>)	Green	N/A	Present in suitable habitat
Magpie (<i>Pica pica</i>)	Green	N/A	Present in suitable habitat
Hooded Crow (<i>Corvus cornix</i>)	Green	N/A	Present in suitable habitat
Wood pigeon (<i>Columba palumbus</i>)	Green	N/A	In song in suitable habitat
Chiffchaff (<i>Phylloscopus collybita</i>)	Green	N/A	In song in suitable habitat
Starling (<i>Sturnus vulgaris</i>)	Amber	N/A	Present in suitable habitat
Swallow (<i>Hirundo rustica</i>)	Amber	N/A	Feeding over the area
House Martin (<i>Delichon urbicum</i>)	Amber	N/A	Feeding over the area
Sparrowhawk (<i>Accipiter nisus</i>)	Green	N/A	In suitable habitat
Swift (<i>Apus apus</i>)	Red	N/A	In flight over the Site
Siskin (<i>Carduelis spinus</i>)	Green	N/A	In song in suitable habitat
Treecreeper (<i>Certhia familiaris</i>)	Green	N/A	In song in suitable habitat

5.4.4.6 Wintering Birds

In addition to Light-bellied Brent Goose *Branta bernicla hrota* other Special Conservation Interest (SCI) species of European Sites were recorded at the site of the Proposed Development or in the adjacent fields/pitches during the Winter Bird Surveys, in small numbers that were not deemed to be significant. These are Curlew *Numenius arquata*, Oystercatcher *Haematopus ostralegus*, Black-tailed Godwit *Limosa limosa*, and Black-headed Gull *Chroicocephalus ridibundus*. These species are addressed in detail in the Natura Impact Statement that accompanies this application under separate cover.

5.4.4.7 Amphibians

The common frog (*Rana temporaria*) is listed under Annex V of the Habitats Directive and is further protected in Ireland under the Wildlife (Amendment) Act 2000. Smooth Newt (*Lissotriton vulgaris*) are protected in Ireland under the Wildlife (Amendment) Act 2000.

2019 Survey

An amphibian survey carried out in March 2019 recorded no common frog *Rana temporaria*, smooth newt *Lissotriton vulgaris* or their spawn/eggs within the Site of the Proposed Development, or along the drainage ditch which runs outside the northern boundary of the Site. No features considered suitable for breeding amphibians were identified within the site of the Proposed Development (e.g., ponds, puddles, drainage ditches or other water features). Common frog are widespread and likely to be present onsite or within the surrounding lands.

2022 Surveys

A suite of amphibian surveys conducted over July 2022 by Amphibian specialist Rob Gandola covered the Site of the Proposed Development and a number of locations outside of same i.e., The Model Garden, Duck Pond, City Farm and several drainage ditches within St. Anne's Park. The Site itself was found to have no habitat suitable for either native amphibian species that could potentially inhabit the area, apart from some potential foraging habitat within the linear treelines or adjacent mixed woodland. However, no observations of any amphibian using these linear habitats have been recorded to date suggesting that the habitat is of poor suitability for amphibians.

Although ample suitable habitat exists for both species in the Model Garden; in the ponds and immediate area, neither species of amphibian were detected. The surveyor noted that these ponds have undergone restoration works in recent years, are likely to still be maturing and may support populations in the future. Neither species of native amphibian was detected using the Duck pond, nor were they encountered in a number of suitable terrestrial habitats in the immediate vicinity of the pond. The City Farm has had frog spawn introduced in the past according to staff. This spawn had been allowed to develop naturally and the froglets had been allowed to emerge and disperse into the adjoining allotment area and wider park. This may result in recolonisation of the park by this species.

The Site of the Proposed Development supports no areas of standing water nor other wetland habitats i.e., no suitable breeding habitat, and no amphibians were recorded or would be expected at the Site according to Mr Gandola's report, which concludes that the Proposed Development is unlikely to have any direct impacts on common frogs or smooth newts. Please see the Amphibian Report (Appendix F) for further details.

5.4.4.8 European Eel

On the 26th of March 2020, European Eel *Anguilla anguilla* was recorded within the 'Duck Pond' in St. Annes Park by Rob Gandola. Mr Gandola reported seeing 12 eels within the 'Duck pond', with this species identification verified via video evidence by Ms Mahon of Inland Fisheries Ireland. Ms Mahon, confirmed that European eel were the species identified by Mr Gandola and that Inland Fisheries Ireland (IFI) staff had noted this species in the Naniken River 9 years earlier and that a population exists within the Tolka estuary.

In July 2022, Mr Gandola recorded counts of 14 and 19 individual European eels during amphibian surveys of the Duck Pond on 8th and 13th July respectively. European eel of multiple size and age classes (e.g., elvers, yellow eels, and silver eels) were observed.

European eel is a critically endangered species and is listed on the NPWS Red list for amphibians, reptiles and freshwater fish (King et al., 2011). The classification of the European eel as Critically Endangered, is a reflection of its significant decline in Ireland and the Europe-wide decline in eel populations. European eel populations are valued as being of International

Importance as they are an internationally critically endangered fish species both in Ireland internationally. This concern has led to the implementation of a national 'Eel Management Plan' in 2009.

A Freshwater Biological Assessment of the Naniken River was carried out on 24th September 2021 by Enviroguide Senior Ecologist Dr Siobhán Atkinson (See Appendix I). This assessment also included the 'Duck Pond' which was noted to be heavily silted on the day of survey, with patches of emergent vegetation noted along the margins of the pond and islands within it. An extensive duckweed *Lemna* sp. 'carpet' covered large areas of the pond, and filamentous algae was noted within it.

The assessment states the following in relation to the fisheries potential of the pond:

*"The Naniken River could support eel *Anguilla anguilla*, however the one-way sluice flaps at the river outlet, as well as the many barriers within the river, would likely impact their distribution and abundance. European Eel are tolerant of moderately polluted water, however, the current biological status of the Naniken river is not conducive to a healthy eel population. It is noted that eel have been recorded within the Duck Pond. However, given the apparent high level of eutrophication in this pond (evidenced by high algal and macrophyte growth), it is unlikely that a healthy eel population could be sustained in it."*

The Naniken River itself was assigned a Q-value of 3, corresponding with a WFD status of "poor" and a pollution gradient of "moderately polluted". The assessment describes the Naniken as follows:

"The Naniken exhibits signs of poor hydromorphological condition. The stream has been channelised and straightened in the past, and numerous weirs, bridges and perched culverts fragment the river throughout its length (Plate 1). Bank erosion was evident throughout the river and is likely exacerbated by human access to the riverbanks. The riverbanks are very steep in places (2-3m high), and this, coupled with trees along the banks, has resulted in heavy shading throughout the river. The channel substrate was scoured in places (in particular downstream of perched culverts and weirs) on the day of survey, whereas the channel was heavily silted in the slower flowing sections. It appears historic modifications to the river channel have limited its ability to function naturally (e.g. it has limited potential to respond to changes in sediment supply and hydrology)."

5.4.5 Summary of Ecological Evaluation

The habitats present, and species likely to utilise the Site, have been evaluated in Table 5-12 for their conservation importance based on the NRA evaluation scheme (NRA, 2009b). Those selected as key ecological receptors (KERs) are those which are evaluated to be of at least local importance (higher value) and deemed to be at risk of significant effects resulting from the Proposed Development. The impacts of the Proposed Development on these receptors are assessed below in section 5.6. The summary in the table below indicates the evaluation rating assigned to each receptor and the rationale behind these evaluations.

Wintering waterfowl and shorebird species are assessed for potential impacts associated with the Proposed Development in the Appropriate Assessment Screening and Natura Impact Statement that accompany this application under separate cover. As such, the conclusions of these reports are referenced/provided in this Biodiversity Chapter where applicable.

Table 5-12. Evaluation of potential ecological sensitivities within the vicinity of Site of the Proposed Development.

Ecological Receptor	Evaluation	Rationale	Key Ecological Receptor (KER)?
Designated Sites			
North Dublin Bay SAC [000206] South Dublin Bay SAC [000210] North Bull Island SPA [004006] South Dublin Bay and River Tolka Estuary SPA [004024] Baldoyle Bay SPA [004016] Malahide Estuary SPA [004025] Rogerstown Estuary SPA [004015]	International importance	Potential impacts to these European Sites are addressed in the AA screening and NIS which accompany this application under separate cover.	Yes
North Dublin Bay pNHA	National Importance	This pNHA is also designated as an SAC. As such, potential impacts to this protected site are addressed in the AA screening and NIS which accompany this application under separate cover.	Yes
Habitats			
Scrub (WS1)	Local Importance (Higher Value)	Contains a main and annexe badger sett.	Yes
Stone Walls and other stonework (BL1)	Local importance (Higher value)	Bat roost potential noted along northern wall face within wooded margin to north of Site.	Yes
Scattered trees and Parkland (WD5)	Local importance (Higher value)	Small area of mature non-native trees located in north-west of Site with potential to support roosting bats.	Yes
Mixed broad leaf woodland (WD1)	Local importance (Higher value)	Makes up a band along northern boundary and two smaller stands east of Site. Forms part of wildlife corridor system running north and east through St Anne's Park. Potential to support roosting bats.	Yes
Treelines (WL2)	Local importance (Higher value)	Mature treelines running along eastern and southern boundary of Site, mostly non-native, linking up hedgerow habitat and treeline to the east. Potential to support roosting bats.	Yes

Ecological Receptor	Evaluation	Rationale	Key Ecological Receptor (KER)?
Dry meadows (GS2)	Local importance (Lower value)	Rank grassland field covering the majority of the Site. Of some value to local insects, birds and foraging mammals. Widespread habitat.	No
Drainage Ditches (FW4)	Local importance (Lower value)	Consisted of a short-isolated ditch containing no standing water to east of site, and a longer ditch along northern boundary containing significant amount of dumped refuse.	No
Amenity Grassland (GA2) Buildings and artificial surfaces (BL3)	Negligible ecological value	Low ecological value, anthropogenic habitats.	No
Fauna			
Badger	Local Importance (Higher Value)	A breeding main sett and an annexe sett were recorded in the north-west corner of Site. Signs of recent activity.	Yes
Hedgehog Pygmy Shrew	Local Importance (Higher Value)	Widespread species and likely to be present within Site or nearby.	Yes
Red Squirrel Pine Marten Irish Stoat Irish Mountain Hare	Local Importance (Lower Value)	Minimal suitable habitat onsite and unlikely to be present.	No
Otter	Local Importance (Lower Value)	No suitable habitat onsite and unlikely to be present.	No
Bat assemblage	Local Importance (Higher Value)	Several bat species recorded at the Site during activity surveys. Potential roosting habitat present in the form of mature trees, prefab classroom structure and old stone walls.	Yes
Bird assemblage (Amber listed)	Local Importance (Higher Value)	Seven amber listed species noted at the Site.	Yes
Bird assemblage (Green listed)	Local Importance (Higher Value)	Relatively common species recorded at the Site overall. Site provides nesting/foraging habitat in boundary treelines /woodland and Scrub habitats	
SCI Waterfowl and shorebirds	International importance	Previous ex-situ usage of the Site and adjacent lands by SCI species in the past.	Yes
Common Frog	Local Importance (Lower Value)	Little potential habitat within the Site of the Proposed Development.	No

Ecological Receptor	Evaluation	Rationale	Key Ecological Receptor (KER)?
Smooth Newt	Local Importance (Lower Value)	No potential habitat within the Site of the Proposed Development.	No
Common Lizard	Local Importance (Lower Value)	Little potential habitat within the Site of the Proposed Development.	No
European Eel	National Importance	Localised population of critically endangered European eel recorded in the 'Duck Pond' at St Anne's Park in 2020 & 2022.	Yes

5.5 Characteristics of the Proposed Development

Raheny 3 Limited Partnership are applying for permission for development on lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5. The 6.7 ha site is bound to the north, east and south by St Anne's Park and to the west by residential development at The Meadows, Sybil Hill House (a Protected Structure) and St Paul's College. Vehicular access to the site is from Sybil Hill Road.

The Proposed Development consists of the construction of a residential and nursing home development set out in 7 no. blocks, ranging in height from 4-7 storeys to accommodate 580 no. apartments, residential tenant amenity spaces, a crèche and a 100-bed nursing home. The site will accommodate car parking spaces, bicycle parking spaces, storage, services and plant areas at both basement and podium level.

Landscaping will include extensive communal amenity areas, and a significant public open space provision on the east and south of the site. The proposed application includes all site landscaping works, green roofs, substations, boundary treatments, lighting, servicing, signage, surface water attenuation facilities and associated and ancillary works, including site development works and services above and below ground. For a full description of the Proposed Development please refer to the Statutory Notices.



Figure 5-14: Proposed Site Layout (Adapted from NMP Landscape Design Statement – August 2022)

5.6 Potential Impact of the Proposed Development

This section details the potential impacts of the Proposed Development on the habitats and species identified as Key Ecological Receptors in Section 5.4.5. Those receptors not deemed to be KERs are not considered further in this assessment, as they are either not considered to be significant in the context of the Site of the Proposed Development or are not considered to be at risk of likely significant impacts.

5.6.1 Construction Phase

5.6.1.1 Designated Sites

5.6.1.1.1 European Sites

The closest European Sites to the Proposed Development are the North Dublin Bay SAC and North Bull Island SPA, both located c. 1.1km to the east. The AA Screening Report (Enviroguide, 2022) has concluded that, on the basis of objective information, the possibility cannot be ruled out that the Proposed Development will not have a significant effect on any of the Natura 2000 sites listed below:

- North Dublin Bay SAC [000206]
- South Dublin Bay SAC [000210]

- North Bull Island SPA [004006]
- South Dublin Bay and River Tolka Estuary SPA [004024]
- Baldoyle Bay SPA [004016]
- Malahide Estuary SPA [004025]
- Rogerstown Estuary SPA [004015]

A Natura Impact Statement (**NIS**) has been prepared by Enviroguide and accompanies this planning application under separate cover. The NIS concludes the following:

Wintering Bird Surveys - Conclusions

Light-bellied Brent Goose

It has been determined, based on the best scientific information by the authors, including the analysis of the information as contained in this NIS, that the loss of ex-situ inland feeding habitat at the Site as a result of the Proposed Development will not adversely impact on the conservation objective attributes of Light-bellied Brent Geese of "Distribution" and "Population Trend".

Other Special Conservation Interest Species

While some foraging habitat for other SCI species (i.e. Curlew, Oystercatcher, Black-tailed Godwit and Black-headed Gull) will be lost as a result of the Proposed Development, the results of the WBS at the site have demonstrated that this site is not considered to be of High or Major Importance for any of these species and that therefore this loss will not have a significant impact on any of these species.

It is therefore considered, based on both the numbers and frequency of occurrence of SCI species recorded at the Proposed Development site over the course of the wintering bird seasons (2015/16, 2016/17 & 2018/19 2019/20 2020/21 and 2021/22), that the loss of ex-situ habitat will not impact on the conservation objective attributes of "Distribution" and "Population Trend" of any of the SCI species recorded at the Proposed Development site.

Construction-related Surface Water Discharge – Conclusions

A potential for impact on South Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC and North Bull Island SPA was identified due to the possibility of discharge/run-off of surface waters containing sediment, silt, oils and/or other pollutants during the Construction Phase of the Proposed Development into the Naniken Stream, which flows into North Bull Island's South Lagoon.

Construction-Related Surface Water Discharges

Specific and detailed mitigation measures are proposed to address the potential adverse effects that may arise from construction-related surface water discharges from the Proposed Development and a Construction Environmental Management Plan (**CEMP**)

has been prepared and will be implemented by the contractor during the construction of the Proposed Development.

It is the professional opinion of the authors and design team that once the mitigation measures out-lined in the NIS, are implemented, no adverse effects on the European sites will arise during the Construction Phase of the Proposed Development or as a consequence of run-off of sediment/silt or contaminated waters into the Naniken Stream during the Construction Phase of the Proposed Development.

5.6.1.1.2 Natural Heritage Areas

North Dublin Bay pNHA is linked to the Site via the Naniken Stream, which will receive Operational Phase surface water discharges from the Proposed Development once completed. The potential for impacts to this hydrologically linked site is covered in detail (by proxy as discussed in section 5.4.2.2) within the NIS which accompanies this application and it is deemed that there will not be any significant impact as a result of the Proposed Development.

5.6.1.2 Habitats

There will be **no** loss of the mature eastern boundary Holm Oak treeline (WL2) as a consequence of the Proposed Development. Several trees located at the Proposed entrance to the Site from Sybil Hill Road and located along the proposed access road into the Site, will be removed as part of the proposed works. These comprise of three Lawson Cypress (*Chamaecyparis lawsoniana*), a Silver Birch (*Betula pendula*) and a Norway Maple (*Acer platanoides*) (tree no. 63, 64, 65, 66 & 'I' as per the Arboricultural Report and Tree impacts Plan (Treefile, 2022), and a treeline of 7no. ornamental cherry trees (*Prunus sp.*) (tree no. 22 – 28). These trees are largely mature Category B 'Good' quality trees, although of non-native/ornamental varieties. Their removal is necessary to allow for the main access road to the Site to be constructed.

Collectively this will represent a **negative, slight, permanent** impact to treelines at a local scale, based on the ornamental nature of these specimens in the context of the wider Site and the existing tree cover.

The Mixed Broadleaf Woodland (WD1) habitat, located to the north and east of the Site, is being retained in the project design. Minor portions of the western section of WD1 habitat will be affected by works along the proposed access road connecting the Site with Sybil Hill Road. A number of Leyland Cypress (*Cupressocyparis leylandii*), and tree no. 34 & 35 (Ornamental Cherry and Ash respectively) will also be removed.

Collectively these losses will represent a **negative, slight, permanent** impact to WD1 habitat at a local scale, based on the ornamental nature of these specimens in the context of the wider Site and the existing tree cover.

The loss of Scattered Trees and Parkland (WD5), Scrub (WS1) and Stone Walls and Other Stonework (BL1) habitats at the Site will be more significant, due to the age of the trees and stone structures in question and their respective bat roost potential; and the presence of badger setts within the scrubby north-western corner of the Site. Their loss solely as habitat features represents a **negative, slight, permanent** impact at a local scale, based on their limited presence onsite and their abundance and widespread nature in the surrounding St. Anne's Park. Specific impacts to bats and badgers are considered separately in the proceeding sections.

5.6.1.3 Mammals

5.6.1.3.1 Badger

A main badger sett and associated annexe sett have been identified in the north-western scrub at the Site. The main sett has been confirmed as an active breeding sett with weaned cubs recorded on trail camera footage in July 2022. The Proposed Development will require the removal of these setts to allow for the construction of part of the proposed buildings in this section of the Site.

The loss of this sett will represent a **negative, significant, permanent** impact at a local scale in the absence of mitigation or compensation.

The excavation of the sett in the absence of suitable surveys, and exclusion of badgers if present, could lead to death or injury of badgers and would represent a **negative, profound, permanent** effect at a local scale.

Noise disturbance impacts associated with the Construction Phase will constitute a **negative, short term, significant** impact at a local scale in the absence of mitigation.

5.6.1.3.2 Small mammals

Entanglement and entrapment in construction waste such as plastic sheeting, netting etc., presents a potential **negative, slight, short-term** impact at a local scale, in the absence of mitigation.

Some habitat loss will result in a **negative, permanent, slight** impact at a local scale.

Noise disturbance impacts associated with the Construction Phase will constitute a **negative, short term, significant** impact at a local scale in the absence of mitigation

5.6.1.3.3 Bats

The construction of the Proposed Development will require the removal of vegetation during site clearance works in addition to a number of trees (WD5) located within the Site that were identified as having potential to support roosting bats. Although these trees were not confirmed as potential bat roosts during any of the bat surveys undertaken in 2021 and 2022 they still may be utilised by roosting bats on other occasions. Vegetation across the Site was also considered suitable for bats to forage and commute along. The removal of these trees and other vegetation would result in **negative, slight, permanent** impacts to local bats.

Should bats be present roosting in these trees during their felling, then there is the potential for **negative, significant, short-term** impacts through the injury/mortality of roosting bats, in the absence of mitigation measures.

Temporary lighting required during the Construction Phase could illuminate previously unlit feeding areas along the Site's woodland and treelined boundaries, or potential tree roosts making them unsuitable for bats. Although Leisler's bats and pipistrelle species previously recorded onsite may tolerate some lighting of feeding areas, other species are potentially adversely affected by strong lighting. Construction night-time lighting could therefore represent a source of **negative, significant, short-term** impacts in the absence of appropriate mitigation.

5.6.1.4 Birds

All birds, their nests and their eggs are protected under the Wildlife Acts 1976 as amended. If vegetation clearance is carried out during the breeding bird season (i.e., from the 1st March to the 31st August), there is the potential for **negative, significant, short-term** effects to local breeding bird populations through nest destruction and mortality.

The loss of potential nesting habitat in general at the Site, through the replacement of existing grassland and scrub habitats with buildings will represent a **negative, moderate, permanent** impact at a local scale.

Noise, vibration and increased human presence associated with the Construction Phase of the Proposed Development could theoretically result in a disturbance impact to local breeding bird populations during the bird breeding season and has the potential to result in reduced breeding success of birds in green spaces adjacent to the construction zone. Due to the proximity of the Proposed Development to St Anne's Park, which is used by people on a frequent basis, and that the urban nature of the surrounding lands to the north-west, birds on the Site of the Proposed Development are likely habituated to a degree to human related disturbance. The impact of construction related activity on local breeding bird populations in vicinity of the Proposed Development will likely represent a **negative, slight, short-term** impact at a local level in the absence of mitigation.

Wintering birds recorded at the Site related to ex-situ feeding species listed as SCIs for European Sites listed in previous sections of this report. These species are addressed in detail in the NIS submitted as part of this planning application under separate cover. The five (5) no. SCI from the relevant European Sites are evaluated based on scientific information detailed in the NIS and it is concluded that the Proposed Development will not adversely affect the integrity of any European Sites, either alone or in combination with other plans and projects, taking into account the conservation objectives of said sites.

The species that were recorded in winter only related to these European Sites and are addressed in the NIS. There are no wintering species other than these that are directly related to the Site of the Proposed Development and therefore no impact on non SCI wintering species is anticipated.

5.6.1.5 European Eel

European Eel have been recorded using the 'Duck Pond' located to the north-east of the Site of the Proposed Development. The Proposed Development entails the draining of Operational Phase surface water through the Site via a series of sewers, ultimately discharging to the Naniken River. To enable this flow route, a new sewer and headwall is proposed to be constructed to the north-east of the Site. The Naniken River forms a connection with 'Duck

Pond' prior to its outflow into Dublin Bay and as such a temporary hydrological connection exists between the Construction Phase of the Proposed Development and this pond containing European Eel, through the construction of the new outflow point to the Naniken River.

There is the potential for construction related contaminants, such as cementitious materials, sediment and oils, to enter the river during these works, which will likely entail amendments to the river bank to install the outflow.

In a worst case scenario and in the absence of mitigation measures, this could lead to a potential **negative, significant, short-term** impact at a local scale to European Eel, should they be present in the 'Duck Pond' at the time of the works and should such pollutants reach the pond.

5.6.2 Operational Phase

5.6.2.1 Designated Sites

The closest European Site to the Site of the Proposed Development is North Dublin Bay SAC and North Bull Island SPA, both located approximately 1.1 km to the east (as the crow flies). The AA Screening Report has identified several potential sources of likely significant effects to the below European Sites that warrant further attention:

- North Dublin Bay SAC [000206]
- South Dublin Bay SAC [000210]
- North Bull Island SPA [004006]
- South Dublin Bay and River Tolka Estuary SPA [004024]
- Baldoyle Bay SPA [004016]
- Malahide Estuary SPA [004025]
- Rogerstown Estuary SPA [004015]

A NIS has been produced and accompanies this planning application under separate cover. The NIS concludes that the loss of the ex-situ feeding site for Species of Conservation Interest of the relevant European Sites will not significantly affect these species, and that the mitigation measures outlined in the NIS, when implemented, will ensure that no likely significant adverse effects on the European Sites will arise during either the Construction Phase of the Proposed Development or as a consequence of surface water discharge to the Naniken Stream during the Operational Phase of the Proposed Development.

5.6.2.2 Habitats

Given the nature of the surrounding area, which is predominately suburban in nature, and the retention of the mature boundary habitats at the Site, the Proposed Development operation is likely to have an imperceptible impact on the surrounding habitats.

Furthermore, the inclusion of 20969.91m² of semi-private open space (33.92% of a developable area of 61822.62m² within the landscaping of the Proposed Development, along with extensive tree, shrub and green space planting, will have a positive effect on habitat provision at the Site.

The proposed landscape plan, as designed by Niall Montgomery + Partners Landscape Architects (NMP), includes the planting of 714 no. new trees at the Site, to replace the 33 trees/tree groups to be removed as part of the proposed works. These trees will be largely native species and will include:

- a woodland buffer running north-south along the eastern front of the Proposed residential development, separating them from the eastern green space/ playing fields,
- an area of native tree planting in the north-eastern corner of the Site,
- a series of 'Gardens' comprising diverse tree and shrub planting. The north-western corner of the Site in particular will encompass the 'Garden of Goodness', a landscaped woodland area where it is proposed to plant 14 no. large semi mature specimen trees in advance of construction works, to provide additional screening of the Site from the west and to replace the existing trees to be removed in this corner of the Site. A further 40-50 large standard trees are planned for this part of the Site (NMP, 2022), and
- areas of wildflower planting located throughout the Proposed Development.

In addition, approximately 60% of the roof space provided by the proposed structures will support green roofing which will provide an additional source of foraging habitat for pollinators, birds and bats.

As such, the proposed landscaping of the Site will offset the loss of the trees to be removed as part of the Proposed Development and will have a **positive, significant, permanent** effect on habitat provision at the Site; through the replacement of the existing rank grassland field and sections of scrub, with a more diverse habitat mosaic including a high degree of native and non-native tree planting and diverse understorey planting.

5.6.2.3 Mammals

5.6.2.3.1 Badgers, Hedgehogs and Pygmy shrew

The operation of the Proposed Development will result in a general loss of foraging habitat for local mammals, as much of the open rank grassland is replaced with buildings, artificial surfaces and landscaped areas. Green spaces are provided along the north-western, north-eastern and eastern portions of the Site, but these will be fenced and gated, and will not provide readily available foraging habitat.

Walls and fencing may affect free movement of badgers through the Site in addition to human presence, pet dogs and other disturbances. Foraging in areas that will be close to human activity is also likely to be hampered or abandoned.

As such, the loss of potential foraging and commuting habitat at the Site will represent a **negative, slight, permanent** impact, at a local scale, to local mammals. Abundant analogous grassland and marginal habitat is present across St. Annes Park and, therefore, this will not represent a significant impact.

The presence of humans within a currently unoccupied site, and the possible associated introduction of dogs, will lead to increased disturbance potential for any resident badgers. This will further reduce or even remove the ability of badgers to forage successfully within the Site going forward and at worst would lead to injury from dog attack. This will equate to a **negative, moderate to significant, permanent** impact in the absence of any mitigation.

The Badger Assessment Report prepared by Brian Keeley (2022) states the following with regard overall impacts from the Proposed Development on Badgers:

“There is a loss of foraging area through the space taken up by the housing and all associated infrastructure and through the loss of scrub and grassland within the site.

There is a loss of tree cover that will affect badgers by reducing feeding and commuting areas. This is unlikely to have a direct impact on the status of this species, but it is contributory in a minor way to an overall diminution in habitat availability in this area of Dublin. The presence of St. Anne's Park will sustain areas of feeding while there will be the loss of the breeding sett and adjoining sett.”

5.6.2.3.2 Bats

During the dusk transect surveys undertaken in 2021 and 2022 there was evidence of bat activity (i.e., foraging and commuting) recorded across the Site of the Proposed Development. During the surveys, brightly lit areas around St Paul's College grounds and Sybil Hill Road were generally avoided by bats and most bats recorded were located along the boundaries of the open space in close proximity to St Anne's Park.

The presence of artificial lighting due to the Proposed Development in these areas is likely to result in some localised impact to bats commuting through or feeding within the Site of the Proposed Development. Lighting during the operation of the Proposed Development has the potential to reduce the commuting and foraging habitat available to local bats should lighting be directed onto boundary tree lines and vegetation at the Site. It is likely that bats will be able to still pass through the area, albeit via different dark corridors to those currently used, and with less potential for foraging within the Site itself. In the absence of mitigation, the impact to bats as a result of operational lighting is considered to represent a potential **negative, significant, permanent** impact at a local scale.

In order to positively enhance the potential bat roosting habitat on site, it is proposed that 5 no. bat boxes (2 F Schwegler General Purpose woodcrete – mixture of concrete and wood, or equivalent) be erected on mature trees located within or (if possible) directly adjacent to the Site. The boxes proposed are long-lasting and durable.

5.6.2.4 Birds

Notwithstanding the issue of the potential for wintering birds to use the Site of the Proposed Development (see “*Designated Sites*” sections above), bird species likely to be breeding on the Site are common species found in suburban areas, parks and in residential gardens. Therefore, the impact of the operation of the Proposed Development is deemed to be an imperceptible effect on local breeding bird populations. No wintering species that are specific to the Site were recorded and therefore there will be no impact from the Operational Phase on wintering species directly related to the Site.

5.6.2.4.1 Increased tree provision

As detailed in section 5.6.2.2, the landscaping proposed for the Site entails the planting of over 700 trees, many of which are native species. This increase in tree cover across the Site will provide additional nesting/foraging resources for local passerines, along with a slight increase in habitat connectivity over what is currently open field habitat. This increase in tree cover at the Site will represent a **positive, moderate, permanent** impact at a local scale

5.6.2.4.2 Collision with Site Structures

Tall structures such as electrical pylons, wind farms and tall buildings can lead to fatal collisions with commuting bird species. This is particularly true for those species considered to be “poor” fliers, with relatively low manoeuvrability compared to other more agile bird species (see Eirgrid, 2012).

Some of the most at-risk groups (classified as ‘medium’ and ‘high’ collision risk species) include wader species; waterfowl such as geese, swan and duck species; and some raptor species. Gulls such as Black-headed Gull, Herring Gull and Lesser Black-backed Gull are classed as ‘low’ collision risk species due to their superior manoeuvrability when flying (Eirgrid, 2012).

Likelihood of Collision Impacts

The physical location of buildings and structures can influence the likelihood of bird collisions, with structures placed on or near areas regularly used by large numbers of feeding, breeding, or roosting birds, or on local flight path; such as those located between important foraging and roosting areas, can present a higher risk of collision.

The Site of the Proposed Development is located within an urban park in which waterfowl and shore bird species are known to feed among the various green spaces provided therein. While it is noted that Bull Island SPA is located ca.1.1km to the east of the Site the Site is not located directly on the coast, or immediately adjacent to the SPA. The Site in itself is not deemed to represent suitable *ex-situ* feeding/roosting habitat for any such species (Habitats present largely comprise of built land and high sward rank grassland, transitioning to scrub).

Building Height

The Proposed Development entails building heights ranging from 4-7 storeys in height (See Figure 5-15) and as such, the risk of migrating birds colliding with the structure due to its height is deemed to be negligible [Migrating species tend to commute far above this with Swans and Geese flying up to 2500ft (ca.750m) during migration along Irish Coasts (Irish Aviation Authority, 2020). Birds that fly over the Site to commute across the city or in order to reach feeding grounds at various locations would fly lower than this, however, even at these lower flight heights, the bird species in question are capable of flying above the maximum height of the proposed buildings and, once the structures are made of visible materials i.e., not entirely comprised of reflective materials such as glass, the birds will simply fly around or over them.

Illustrative Site Wide Aerial Diagram

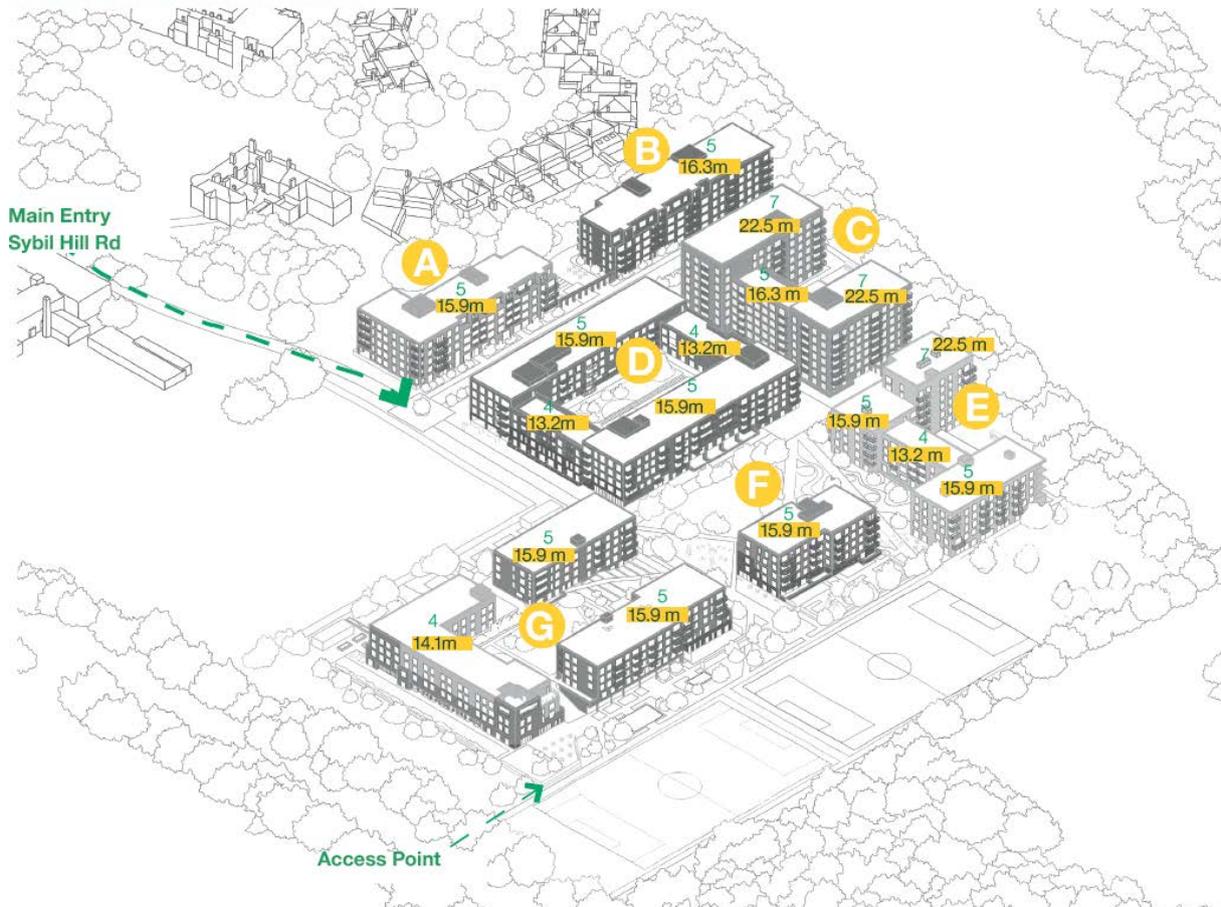


Figure 5-15 Proposed building heights at the Site of the Proposed Development (Adapted from Foxlands, Design Statement, 2022)

Building Appearance

The overall façades of the proposed buildings are largely opaque in nature, with a varied material composition which breaks up any reflective areas. These architectural design features provide important visible cues as to the presence and extent of the proposed structures to any commuting/foraging bird species should they be in the vicinity of the Site. This overall visual heterogeneity of the building façades will be sufficient to further ensure that the risk of bird collisions as a result of the Proposed Development is negligible. These architectural design features are part of the overall design of the Proposed Development and are not considered to represent specific mitigation measures to prevent collisions, however, they will contribute to the overall effect in this regard.



Figure 5-16. Example of the proposed building façades (Block D) with opaque materials comprising coloured brick, stone panelling, and metalwork throughout (Adapted from Design Statement, Hawkins Brown, 2022).

As such, based on the heights and the physical appearance of the proposed structures, it is deemed that birds including SCI species such as Brent Geese and any other 'at-risk' bird species, do not have the potential to be impacted by the Proposed Development through collisions or obstructions to flight-lines over the Site, and the collision risk is therefore deemed to be **negligible** in the absence of any mitigation.

5.6.2.4.3 European Eel

European Eel have been recorded using the 'Duck Pond' located to the north-east of the Site of the Proposed Development. The Proposed Development entails the draining of Operational Phase surface water through the Site via a series of sewers, ultimately discharging to the Naniken River via a new sewer and headwall to be constructed to the north-east of the Site. The Naniken River forms a connection with 'Duck Pond' prior to its outflow into Dublin Bay and as such a hydrological connection exists between the Operational Phase of the Proposed Development and this pond containing European Eel.

In terms of the potential impacts to European Eel associated with Operational Phase surface water, the following was noted by Ms McMahon of Inland Fisheries Ireland (IFI)⁵

"The European eel is a hardy species and will survive in moderately polluted water. However, it will not thrive there, and pollution is likely to reduce its numbers. In particular, it will be

⁵ As detailed in Ms McMahon's affidavit in 2020 as part of a previous application on the Site.

impacted by eutrophication or chemical pollution of waters. Eutrophication occurs where there is inadequate dissolved oxygen available due to it being used up, usually by microorganisms. This often happens when excess phosphates or other nutrients are added to the water. Detergents and washing powders frequently contain phosphates, so that car washing in the car park of a development could lead to discharge of nutrients to storm water drains. ..."

In the absence of mitigation, there is the potential for contaminants from the Site's operation to enter the Naniken River and reach the pond in question. Such contaminated waters could include soapy run-off from future residents washing their cars, and hydrocarbon pollutants collected on vehicular roads within the Proposed Development.

Due to the intermittent nature of activities such as private car washing, any potential impact linked with surface water run-off containing soap is likely to be limited and somewhat dependent on rainfall levels at the Site. It is also noted that a suite of surface water management measures have been included in the proposed project design, including SUDS measures to improve the quality of the surface water generated by the Proposed Development prior to outflow to the Naniken. Even in the absence of these measures, significant impacts to European Eel are not considered likely due to the intermittent nature any potential pollution source and the dilution potential within the receiving waterbodies (Naniken River and Duck Pond).

Potential impacts in the absence of mitigation are therefore assessed in a precautionary manner as **negative, slight, permanent** as the impact source will exist as long as the development exists.

5.6.3 Potential Cumulative Impacts

In the Dublin City Development Plan 2016-2022 (**DCDP**) the site of the Proposed Development is zoned as "*Zone Z15 Community and Institutional Resource Lands (Institutional and Community, Community, Green Infrastructure and Health)*", while the surrounding area to the north-east and west is zoned as "*Zone Z1: Sustainable Residential Neighbourhoods*".

St Anne's Park to the north-west, east and south is zoned as "*Zone Z9: Amenity/Open Space Lands/Green Network*". A small section of the site to the northeast, is zoned Z9. This Zoning Objective is "To preserve, provide and improve recreational amenity and open space and green networks." No residential development is proposed on the lands contained within the application boundary which are zoned Z9.

Existing or proposed projects or plans impacting on the same KERs have the potential to lead to impacts of a higher level of significance when assessed cumulatively. This applies to potential impacts on bats as a consequence of the combined loss of suitable roosting, commuting and/or foraging habitat in the locality and potential impacts on birds as a consequence of the combined loss of suitable nesting bird habitat in the locality.

The Proposed Development is not likely to result in any significant impacts when assessed in isolation in relation to these receptors as the amount of proposed vegetation clearance is minimal. Given that it is unlikely that there would be wide-scale vegetation clearance in the surrounding locality (*i.e.* the surrounding area is predominantly made of residential houses and gardens and St Anne's Park) significant cumulative impacts are unlikely.

With regards to the *potential* cumulative impact on wintering birds as a result of the Proposed Development, acting in-combination with other plans or projects, the NIS (Enviroguide 2022) concludes that the Proposed Development in combination with other sites will not have any impact on the qualifying interests (*i.e.* wintering birds) for the following reasons:

- The number of sites with proposed development which will or could result in loss of grassland is 7 (8 including the Proposed Development) (these 7 sites are numbered 50, 6, 43, 55, 33, 51 and 59 in Table 15 of the NIS) and the birds in the highest usage scenario (e.g., 2020/21 season) are using just c. 60% (*i.e.*, ca. 90 sites) of the available network in any given winter. This means that the combined loss of all of these 7 sites if it were to occur is not significant in respect of the overall network.
- The highest level of usage by Light-bellied Brent Geese in the last six seasons, based on both live observations and droppings, was 90 sites used in 2020/21. This equates to c.60% of the available known sites being used. In this highest usage scenario there still remains c. 40% of available known sites being unused in a given winter.
- It has been demonstrated that the birds visit *ex-situ* sites on a fluid basis so that the effect of the loss of any individual site will result in the birds relocating to another site without duress.

Refer to the NIS (Enviroguide, 2022) accompanying this planning application for full details of this assessment.

5.6.4 “Do Nothing” Impact

In the event that the Site of the Proposed Development was not developed, there would be no resulting additional impacts on the Biodiversity (Flora and Fauna) at the Site. The habitat would likely remain as rank grassland meadow, gradually transitioning to scrub; with scrub habitats encroaching from the margins of the Site and the patches currently establishing throughout the fields. The lands would continue to be utilised by local mammals and breeding bird species, although limited wintering waterfowl or shorebird usage would be expected. The St. Paul's school pitch would likely be the focus of any such bird activity in the area.

5.7 Avoidance, Remedial & Mitigation Measures

5.7.1 Mitigation 1: Controlled Vegetation Removal

Hedgehog

During the Construction Phase of the Proposed Development Hedgehogs in particular have the potential to be significantly impacted through the loss of suitable hibernation and nest sites in the form of piles of dead wood, vegetation and leaves on site.

This can be mitigated through the careful removal of dead wood/leaves to another part of the site where they will not be affected. Woody debris from the proposed management of hedgerow/treeline areas on site should also be left in this out-of-the way area as compensatory hedgehog habitat during the Construction Phase.

Work likely to cause disturbance during hibernation – for example removal of hibernation habitats such as log piles and dense scrub/hedgerow – should not take place during Winter

i.e., 1st November to 1st March, but also must take into account the breeding bird season (1st March to 31st August.) in order to avoid potential nest destruction and bird mortality.

As such, it is recommended that any removal of trees or scrub be carried out in **September/October** in order to ensure the best biodiversity outcome and to comply with the Wildlife Acts 1976 and Amendments.

Nesting birds

The removal of trees and scrub will be completed outside the main bird nesting season i.e., **1st March to 31st August**. where possible, Should removal within this period be unavoidable, a suitably qualified Ecologist will be instructed to survey the affected vegetation prior to removal. Should any active nests and/or eggs be present, the section of vegetation containing them will be noted and fenced off and protected until the young birds have fledged and left the nest or, where possible, the end of the nesting season. Fledging will be confirmed by the Ecologist through further surveys. Once this has been confirmed the nest can be removed and the vegetation cleared under the supervision of the Ecologist. Please note that active nests will require a buffer zone to limit the disturbance of works in their vicinity. This will be agreed in consultation with the Ecologist.

5.7.2 Mitigation 2: Badgers

Transport Infrastructure Ireland's (TII, previously the NRA) *Guidelines for the treatment of badgers prior to the construction of national road schemes*, will be consulted in terms of the management of potential badger setts at the Site of the Proposed Development. The following measures are taken from this guidance document and the Badger Assessment Report prepared by Brian Keeley (2022) (See Appendix E) and adapted to apply to the Proposed Development.

Prior to the commencement of any construction works, a pre-construction badger survey will be carried out by a suitably qualified Badger specialist; to establish the current status of the badger setts (main and annexe setts) located in the north-western corner of the Site.

As badgers are known to inhabit the Site and surrounding lands, a Construction Phase Badger Management Plan will be prepared by the Badger specialist, to be approved by the NPWS prior to any works commencing on site. This document will detail any protection zones required to ensure the works do not undermine the setts or their tunnels, and the mitigation measures that will be required to protect badger for the extent of the Construction Phase e.g., no works buffer zone, badger-proof fencing to prevent access to the Site during works etc.

Works close to badger setts will only be conducted under the supervision of the badger specialist under licence from the NPWS. During the breeding season (December to July inclusive), no works should be undertaken within 50m of active setts nor blasting or pile driving within 150m of active setts.

Badger sett tunnel systems can extend up to ca. 20m from sett entrances. As there is the possibility that tunnels would be destroyed by movement of heavy plant over the ground above them, it is essential that no heavy plant cross within 30 metres of a sett entrance (where there is potential for chambers or tunnels beyond this, a 50 metre distance should be observed).

This will ensure that setts are not damaged and that badgers are not inadvertently crushed during construction. Lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance will not take place within 10m of sett entrances unless under the supervision of the badger specialist.

5.7.2.1 *Sett removal*

The retention of the setts in-situ is unfeasible due to spatial constraints and the footprint of the Proposed Development. As such, a suitably qualified Badger specialist will be instructed to prepare an exclusion plan for the decommissioning of the setts and their destruction once all badgers have been confirmed to have vacated. The objective is to allow the badgers to remain within their territory, even though a portion of their current territory will be lost as a result of the Proposed Development. The provision of an artificial sett within the Site of the Proposed Development will also be incorporated into the landscape plan as detailed below.

The existing setts will not be excluded or destroyed until the artificial replacement sett has been constructed.

Exclusion of badgers from the setts

Exclusion of badgers from the setts should only be carried out during the period of **August to November (inclusive)** in order to avoid the badger breeding season.

As per the TII guidance, the removal of badgers from affected setts and subsequent destruction of these setts will only be conducted with NPWS permission/approval, and by experienced badger specialists. The exclusion process will include monitoring to ensure that badgers have fully evacuated the setts prior to their destruction. The NPWS grant permission/approval to the experts undertaking the badger operations and not to the developer or contractor. A badger sett exclusion plan and method statement will be prepared by the badger specialist and provided to the NPWS prior to commencement for their approval. No works will take place without the supervision of the Badger specialist.

Measures to ensure the sett has been vacated and is devoid of all badgers will be designed by the Badger specialist, involving a combination of:

- one-way badger gates on active entrances,
- badger proof fencing,
- soft and hard blocking of inactive entrances, and
- recurring inspections.

Gates will be left installed, with regular inspections, over a minimum period of 21 days before the sett is deemed inactive. Any badger activity at all will require the procedures to be repeated or additional measures taken. Sett destruction should commence immediately following the 21 day exclusion period, provided that all badgers have been excluded. Should a badger be discovered during this operation, the NPWS will be advised immediately and all excavation will cease until it is agreed with NPWS that it may continue.

No exclusion will commence in advance of the completion of the artificial sett.

All setts should be assessed on a case by case basis by a suitably experienced badger expert, with measures adapted to suit the situation as per the expert's direction.

Sett destruction

The destruction of a successfully evacuated badger sett may only be conducted under the supervision of qualified and experienced personnel with approval/permission from the NPWS. The possibility of badgers remaining within a sett must always be considered; suitable equipment should be available on hand to deal with badgers within the sett or any badgers injured during sett destruction.

TII Guidelines recommend that sett destruction is usually undertaken with a tracked 12-25 ton digger, commencing at ca. 25m from the outer sett entrances and working towards the centre of the sett, cutting ca. 0.5m slices in a trench to a depth of 2m. Exposed tunnels may be checked for recent badger activity with full attention paid to safety requirements in so doing.

A report detailing the evacuation procedures, sett excavation and destruction, and any other relevant issues will be prepared by the badger specialist and submitted to the NPWS.

Artificial sett provision

An artificial main sett will be provided within the north-eastern corner of the Site as compensation for the loss of the existing main sett. The possibility of installing an artificial sett elsewhere in the park as compensation was also considered and is a viable alternative, however, the installation of the new sett within a suitable location at the Site is the preferred option.

The new sett location will be located in the north-eastern corner of the Site, approx. 230m east of the existing main sett and linked by the existing woodland corridor present along the Site's northern and eastern boundaries (See Figure 5-18). The new sett will be constructed and established before the badgers are excluded from the existing setts and they are destroyed.

The artificial sett will be accessed by six entrances and will require a minimum of six chambers to accommodate a breeding group of badgers. The badger specialist recommends an area of 15m x 15m for the sett. A dense section of scrub vegetation (e.g., Gorse, Brambles, Elder, Hawthorn, Blackthorn) will be planted within the designated artificial sett area; the goal being to connect the site with the woodland margin along the Site's eastern boundary and provide connectivity with the rest of the park for the badgers to forage as before, to provide shelter and protection for the sett and minimise human related disturbance from the Proposed Development; thus maximising the setts chances of being adopted.

All lighting will avoid illumination of the setts or any alternative setts installed within the Site.

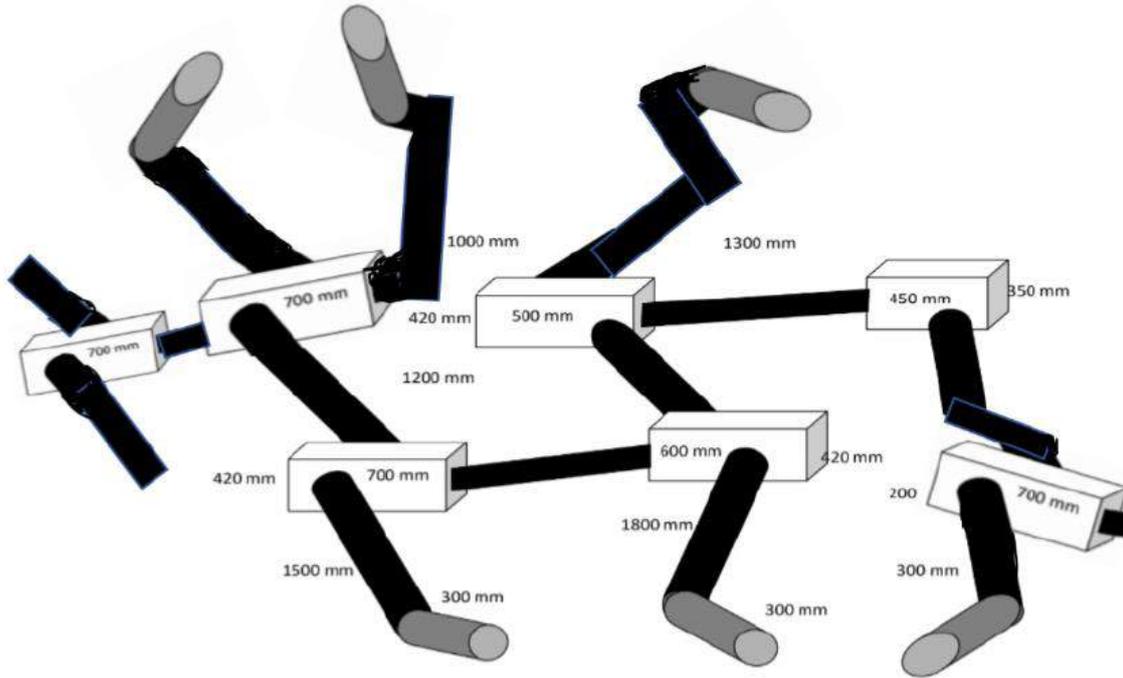


Figure 5-17. Schematic representation of an artificial sett design with 7 chambers and 6 entrances. Three open tunnels would allow expansion of the sett following occupation. Extracted from Badger Assessment Report (Keeley, 2022).



Figure 5-18. Image showing the location of the proposed artificial sett area within the north-eastern corner of the Site (Orange area).

Construction of the artificial sett must not place existing setts in danger. All construction equipment must remain a minimum of 30 metres (up to 50 metres where there is potential for chambers or tunnels) from all existing (naturally constructed) sett entrances during the creation of the new sett.

Artificial setts will be constructed several months in advance of the closure of a breeding sett. In this interval, the affected badgers should be encouraged to utilise the artificial sett by means of attractive food baits (peanuts etc.) and materials from the breeding sett added to the new sett (such as bedding and spoil). The construction of an effective artificial sett is an exercise best conducted by experienced personnel. The constructed tunnels and chamber system will be located in well-drained soils and be landscaped and planted to ensure adequate cover and lack of disturbance.

Recommending monitoring of badger activity is discussed in section 5.9.

Disturbance limitation

In order to minimise the potential for human and dog related disturbance of the new sett area and its surrounding vegetation, access to this portion of the site will be restricted and discouraged through landscaping (e.g., fencing, dense planting) and signage (e.g., 'Dogs to be kept on leads to protect wildlife').

5.7.3 Mitigation 3: Bat-friendly Tree Felling & Pre-demolition Survey

Prior to the demolition of the prefab classroom structure, and/ or the felling of any mature trees within the Site, it is required that a roost inspection survey is carried out by a suitably qualified ecologist in order to determine the presence of any potential roosts, and this expert's input be provided throughout the demolition/tree felling phase.

Any potential bat roost trees, i.e., in particular those located within the north-western section of the subject lands, will be surveyed by a suitably qualified bat ecologist for bat emergence/activity **during the dusk and dawn immediately prior to felling**. This will apply to Horse Chestnut trees 38 and 101 (noted to have moderate-high roost potential on 26th July 2022) and any other trees noted to have roost potential by the bat specialist. If no bats are found to be roosting within these trees, then they will be soft-felled/ section-felled under the supervision of an experienced ecologist/bat specialist.

Felling will take place, where possible, during the months of **September and October**, to avoid both the nesting bird season and the hibernation period for bats; in which roosting bats are most at risk of death or injury during tree felling.

Tree-felling will be undertaken using heavy plant and chainsaw. There is a wide range of machinery available with the weight and stability to safely fell a tree. Normally trees are pushed over, with a need to excavate and sever roots in some cases. In order to ensure the optimum warning for any roosting bats that may still be present, the tree will be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. Any affected trees should then be pushed to the ground slowly and should remain **in place for a period of at least 24 hours, and preferably 48 hours** to allow bats to escape.

Trees felled will not **under any circumstances** be cut up or mulched immediately after felling in case protected wildlife is present.

5.7.4 Mitigation 4: Bat-friendly Lighting

The impact of increased night-time lighting as a result of the Proposed Development will be mitigated through the incorporation of bat-friendly lighting measures into the project design and the lighting plan.

In order to minimise disturbance to bats commuting/foraging in the vicinity of the Site, lighting will be designed to minimise light-spill onto any hedgerows or treelines to be retained at the Site. This can be achieved by ensuring that the design of lighting adheres to the guidelines presented in the Bat Conservation Trust & Institute of Lighting Engineers *'Bats and Lighting in the UK - Bats and Built Environment Series'*, (ILP, 2018) the Bat Conservation Trust *'Artificial Lighting and Wildlife Interim Guidance'* and the Bat Conservation Trust *'Statement on the impact and design of artificial light on bats'*. Therefore, the lighting scheme will include the following:

- The minimisation of night-time lighting emitted during both the Construction and Operational Phases of the Proposed Development (once health and safety requirements are met).
- The avoidance of direct lighting of treelines and hedgerows at the Site, as well as areas of planting.
- Unnecessary light spill controlled through a combination of directional lighting and hooded / shielded luminaires.
- Where appropriate, luminaires on the site boundary will be fitted with light baffles to prevent light spill onto adjacent habitats.
- Areas around the perimeter should not be lit up nor lighting directed towards them. Lighting in these areas should not increase beyond existing night-time lux levels or 1 lux, whichever is the lesser.
- Movement sensor triggered lighting and low level bollards will be considered for paths around the perimeter of the Proposed Development, particularly areas of proposed tree planting.
- Vertical light spill at light sources will be below 3m to avoid potential bat flight paths.
- No floodlighting will be used – this causes a large amount of light spillage into the sky significantly impacting bats. The spread of light should be kept below the horizontal.
- Hoods, louvres, shields or cowls should be fitted on the lights to reduce light spillage.
- Lights will be of low intensity. It is better to use several low intensity lights than one strong light spilling light across the entire area.
- Narrow spectrum lighting should be used with a low UV component. Glass also helps reduce the UV component emitted by lights.
- The source of light will be Light Emitting Diodes (LEDs) as this is a narrow beam that is highly directional and a highly energy efficient light source.

Incorporation of the appropriate luminaire specifications as advised by a lighting professional can have a considerable input in mitigating the potential impact of night-time lighting on local bats.

Night-time lighting across the Site of the Proposed Development will be kept to a minimum during both the Construction and Operational Phases of the Proposed Development through the reduction of light spill from the building interior via windows/entrances, and the reduction of spill/glare from outdoor lighting in place on the building exterior and throughout the Site (see Figure 5-19).

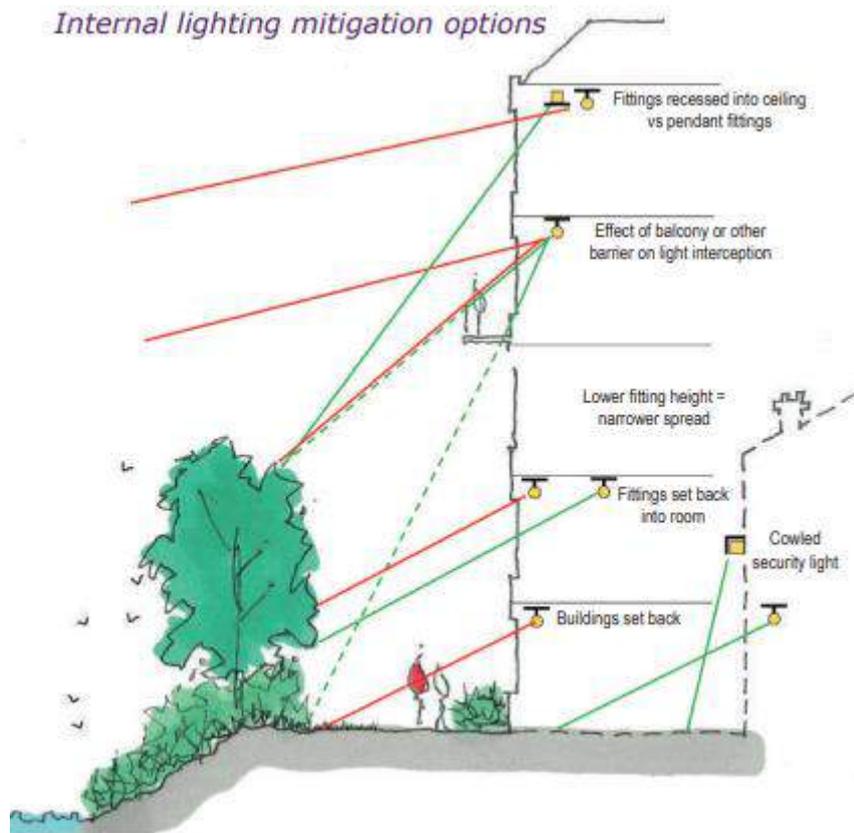


Figure 5-19. Internal Lighting Guidance Diagram adapted from ILP (2018).

It is noted that bat-friendly lighting measures as detailed above will have a similar positive effect with regard to commuting bird species flying at night. Further measures are outlined in 'Best Practices for Effective Lighting' (City of Toronto, 2017).

5.7.5 Mitigation 5: Habitat Protection

There is a potential impact on identified habitats locally and associated fauna, as a result of surface water run-off containing silt, oil or other pollutants into the drainage ditch adjacent to the Proposed Development, with a potential connection with the Naniken Stream (100m north of the Proposed Development) which eventually flows into North Bull Island's south lagoon.

The CEMP will be implemented by the appointed Contractor that details the suitable precautions to be followed in relation to any potential pollution of watercourses from

construction activities. The storage of materials, containers, stockpiles and waste, however temporary, must follow best practice at all times and be stored at designated areas away from watercourses.

The *Engineering Assessment Report* submitted with this planning application, details the comprehensive Sustainable Drainage System (SUDS) that is to be incorporated into the Proposed Development. Similarly, the *Arboriculture Report* completed by The Tree File Consulting Arborists, details the tree protection measures that will be implemented in order to protect trees that are to be retained as part of the Proposed Development.

5.7.6 Mitigation 6: Naniken Stream and European Eel

5.7.6.1 Construction Phase

The following is proposed to ensure that no potential adverse effects will arise from construction-related surface water discharges from the Proposed Development. All works adjacent to the Naniken River will be carried out in accordance with Inland Fisheries Ireland (IFI), "*Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*". Contact will be made with IFI to ensure the works comply with the provisions of the Fisheries Act and Habitats Regulations, and in accordance with any detailed operational and construction requirements issued by IFI.

Best practise Construction measures for works within, or in the vicinity of watercourses will also be followed as per '*Guidelines for the crossing of watercourses during the construction of national road schemes*' (TII, 2008) and '*Control of water pollution from linear construction projects - CIRIA C648*' (CIRIA, 2006). The below measures will be included in the CEMP to prevent the release of hydrocarbons, polluting chemicals, sediment/silt and contaminated waters into the receiving surface water network:

- A suitably qualified Ecological Clerk of Works (ECoW) will be present on-site during the works being undertaken along the Naniken riverbank i.e., the installation of the surface water outfall.
- Specific measures to prevent the release of sediment over baseline conditions to the Naniken River during the construction work, which will be implemented as the need arises. These measures include, but are not limited to, the use of silt traps, silt fences, silt curtains, settlement ponds and filter materials. This is particularly important when undertaking any works/upgrading to the surface and foul water drainage networks at the site of the Proposed Development.
- It will be ensured that all river protection measures will be **maintained in good and effective condition** for the duration of the proposed works and checked regularly to ensure that the silt fencing and other mitigation measures are operating effectively. Daily checks will be appropriate during the initial site clearance, during works in the vicinity of the watercourse, and during and after storm events. Weekly or bi-weekly checks may be appropriate at other times.
- Provision of exclusion zones and barriers such as silt fences between earthworks, stockpiles and temporary surfaces to prevent sediment washing into the Naniken River and/or existing drainage systems and hence the downstream receiving water environment.

- Silt traps will not be constructed immediately adjacent to the Naniken River, i.e. a buffer zone between the trap and the watercourse with natural vegetation must be left intact. Imported materials such as terram, straw bales, coarse to fine gravel should be used either separately or in-combination as appropriate to remove suspended matter from discharges.
- Provision of temporary construction surface drainage and sediment control measures will be in place before the construction of the pipeline and/or earthworks commence.
- Weather conditions will be taken into account when planning construction activities to minimise risk of run-off from the Site.
- Prevailing weather and environmental conditions will be taken into account prior to the pouring of cementitious materials for the works adjacent to the Naniken Stream and/or surface water drainage features, or drainage features connected to same. Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete will not be discharged to the Naniken Stream or existing surface water drainage systems. Concrete washout areas will be located remote from the Naniken Stream or any surface water drainage features, where feasible, to avoid accidental discharge to watercourses.
- Any fuels or chemicals (including hydrocarbons or any polluting chemicals) will be stored in a bunded area to prevent any seepage of into the Naniken Stream, local surface water network or groundwater, and care and attention taken during refuelling and maintenance operations.
- Temporary oil interceptor facilities will be installed and maintained where site works involve the discharge of drainage water to receiving rivers and streams.
- All containment and treatment facilities are regularly inspected and maintained.
- All mobile fuel bowsers will carry a spill kit and operatives must have spill response training.
- All fuel containing equipment such as portable generators will be placed on drip trays. All fuels and chemicals required to be stored on-site will be clearly marked.
- Implementation of response measures to potential pollution incidents.
- Emergency procedures and spillage kits will be available and construction staff will be familiar with emergency procedures in the event of accidental fuel spillages.
- All trucks will have a built-on tarpaulin that will cover excavated material as it is being hauled off-site and wheel wash facilities will be provided at all site egress points.
- Water supplies will be recycled for use in the wheel wash. All waters will be drained through appropriate filter material prior to discharge from the construction sites.
- The removal of any made ground material, which may be contaminated, from the construction site and transportation to an appropriate licenced facility will be carried out in accordance with the Waste Management Act, best practice and guidelines for same.
- A discovery procedure for contaminated material will be prepared and adopted by the appointed contractor prior to excavation works commencing on site. These documents

will detail how potentially contaminated material will be dealt with during the excavation phase.

- Implementation of measures to minimise waste and ensure correct handling, storage and disposal of waste (most notably wet concrete, pile arisings and asphalt).

5.7.6.2 Operational Phase

With regard to the proposed discharge of treated operational surface water from the Proposed Development to the Naniken River, the potential for surface water generated at the Site of the Proposed Development to cause significant effects to downstream sensitivities during the Operational Phase would be considered negligible due in part to the SUDS measures incorporated in the Project Design. Project specific SUDS measures are described below.

The following attenuation and SUDS measures will be incorporated into the Proposed Development as detailed in the Engineering Assessment Report (Waterman Moylan, 2022):

- Permeable paving
- Filter drains throughout Site
- Extensive green roofs on the buildings
- Tree pits located throughout the Site
- Underground attenuation tank
- Flow control device (Hydrobrake or similar) and
- Class 1 Bypass petrol interceptor located prior to outfall to Naniken River.

5.7.7 Mitigation 7: Noise Management

A number of measures will be included in the final CEMP as set out in *BS 5228-1: A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*, that will be put in place during the Construction Phase of the Proposed Development. These will ensure that the level of noise caused by the proposed works will be controlled/reduced where possible so as to minimise the potential disturbance impact on local fauna species.

These measures will include but are not limited to:

- Selection of plant with low inherent potential for generating noise.
- Avoid unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Where noise becomes a source of resonating body panels and cover plates, additional stiffening ribs or materials should be safely applied where appropriate.
- Limiting the hours during which site activities likely to create high levels of noise are permitted.

- Appointing a site representative responsible for matters relating to noise.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

These measures will ensure that any noise disturbance to local birds or any other fauna species in the vicinity of the Site of the Proposed Development will be reduced to a minimum.

5.7.8 Mitigation 8: Reduction of Construction hazards

All construction waste with the potential to harm small mammals e.g., plastic sheeting, netting/mesh will be kept above ground; to reduce the risks to small mammal of suffocation/ entrapment.

To prevent mammals becoming trapped in excavations during the Construction Phase, a means of escape e.g., ramps, or objects such as planks will be placed in pits overnight.

5.7.9 “Worst Case” Scenario

In a worst-case scenario at the Site of the Proposed Development, where the recommendations and mitigation measures described in this report were to be disregarded or should fail; vegetation would be cleared during the nesting bird season causing the destruction of all nests, eggs and some birds during the clearance works.

Should any mature trees marked for felling support roosting bats, and be felled without prior survey, roosting bats could be injured/killed during the works.

Should the badger management plan not be implemented under the correct supervision the works could result in the displacement, injury and death of badgers.

All of the above would represent violations of national wildlife legislation, i.e., offences under the Wildlife Act 1976 as amended; and the harming of bats and destruction of roosts would be contrary to the EU Habitats Directive 1992 and EC (Birds and Natural Habitats) Regulations 2011.

5.8 Residual Impacts

Residual impacts are impacts that remain once mitigation measures have been implemented or impacts that cannot be mitigated. Table 5-13 below provides a summary of the impact assessment for the identified KERs and details the nature of the impacts identified, mitigation proposed and the classification of any residual impacts.

Provided all mitigation measures are implemented in full and remain effective throughout the lifetime of the facility, no significant negative residual impacts on the local ecology or on any designated nature conservation sites, are expected from the Proposed Development. However, in terms of residual impacts to badgers, the loss of an active main breeding sett will result in an unavoidable significant residual impact.

As per the Badger Assessment Report prepared by Brian Keeley (2022), the Proposed Development will result in substantial changes to badger usage of the Site. The works will see a loss of two setts, comprising a breeding sett and a neighbouring annexe sett, as well as significant disruption to the badger family's foraging area. It is proposed that the artificial sett will provide an alternative to the main sett if adopted by the badgers and that the impact of

Proposed Development would then be mitigated to a significant, short-term impact; thus only comprising the loss of an annexe sett, foraging habitat and disruption through the removal of the both setts. Opportunities for continued foraging within St. Anne's Park will persist and the loss of feeding habitat will not be significant and will not affect the conservation status of these badgers. Badgers will be disrupted by the construction and occupancy of housing but with proper mitigation implementation should be free to forage and commute in the surrounding area and through the Site.

Table 5-13 Summary of Potential Impacts on KER(s), Mitigation Proposed and Residual Impacts.

Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation Summary	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
Designated Sites								
Relevant European Sites	International Importance	Surface water run-off containing silt / pollutants into drainage ditch adjacent to Site during Construction Phase, which has potential link to KERs through Naniken Stream nearby.	Negative	n/a	Short-term	Slight	Incorporation of comprehensive drainage system throughout Construction Phase.	Negligible
North Dublin Bay pNHA	National Importance						Incorporation of comprehensive sustainable drainage system (SuDS) during the Operational Phase (See NIS for further detail).	
Habitats								

<p>Treelines (WL2) Scrub (WS1) Mixed Broadleaf Woodland (WD1) Scattered trees and Parkland (WD5) Stone Walls and other Stonework (BL1)</p>	<p>Local importance (higher value)</p>	<p>Loss and/or damage to some sections of habitat during Construction Phase.</p>	<p>Negative</p>	<p>Local scale</p>	<p>Permanent</p>	<p>Slight</p>	<p>Majority of Treelines and mature trees to be retained. Tree protection measures to be adhered to during Construction Phase. Sections of old stone wall at the Site to be retained. Significant increase in tree cover and diverse planting as a result of the proposed landscaping plan.</p>	<ul style="list-style-type: none"> Loss of habitat = Negligible Provision of new tree cover and planting = Positive, Permanent, Significant.
Mammals								
<p>Badger</p>	<p>Local importance (higher value)</p>	<p>Loss of a main and annexe sett. Sett removal while active (if active during construction). Construction noise disturbance. Loss of foraging habitat. Disturbance during operational phase by people/dogs</p>	<p>Negative</p>	<p>Local scale</p>	<p>Permanent Permanent Short-term Permanent Permanent</p>	<p>Significant Profound Significant Slight Moderate/significant</p>	<p>Preconstruction badger survey and assessment of status of setts in north-west of Site. Construction Phase badger management plan to be prepared by Badger expert and approved by NPWS. Mitigation measures as described in section 5.7.2 to be followed under supervision of Badger expert when excluding badgers from and destroying setts. Provision of an artificial sett on site as compensation, with protective screening vegetation</p>	<ul style="list-style-type: none"> Loss of an active sett and annexe sett= Negative, Significant, Short-term (if artificial sett provided) Noise disturbance = Negative, Slight, Short-term. Mortality/injury during sett destruction = No impact.

							<p>to provide shelter and foraging habitat.</p> <p>Suite of noise control measures to be included in the CEMP. Badger specific construction measures as agreed with Badger expert to reduce disturbance e.g., no work zones, screening etc.</p> <p>Operational Phase human disturbance to be minimised through protection of Sett area through landscaping (e.g., fencing, planting) and signage with regards dogs.</p>	<ul style="list-style-type: none"> Loss of foraging habitat = Negative, Slight, Permanent. Operational Phase disturbance = Negative, Slight, Permanent.
Hedgehog Pygmy Shrew	National Importance	<p>Loss and/or damage to some sections of potential habitat during Construction Phase.</p> <p>Disturbance due to noise generated during Construction Phase.</p> <p>Construction hazards</p>	Negative	Local scale	<p>Permanent</p> <p>Short-term</p> <p>Short-term</p>	<p>Slight</p> <p>Significant</p> <p>Slight</p>	<p>Abundant similar habitat in surrounding parkland.</p> <p>Proposed landscaping will provide grassland and verge habitats.</p> <p>Suite of noise control and waste management measures to be included in the CEMP.</p>	<ul style="list-style-type: none"> Loss of habitat = Negative, Short-term, Slight. Noise = Negligible Construction Hazards = Negligible.
Bat Assemblages	National importance	<p>Loss and/or damage to some sections of potential roosting and commuting habitat during Construction Phase.</p> <p>Felling of trees containing roosting bats.</p>	Negative	Local scale	<p>Permanent</p> <p>Short-term</p> <p>Short-term</p> <p>Permanent</p>	<p>Slight</p> <p>Significant</p> <p>Significant</p> <p>Significant</p>	<p>Majority of mature trees and boundary treelines to be retained.</p> <p>Pre-felling/demolition bat roost inspection/surveys to be carried out of bat roost potential trees.</p>	<ul style="list-style-type: none"> Loss of habitat = Negative, Short-term, Slight. Death/injury during felling/demolition= Negative, Short-

		<p>Increased lighting as a result of the construction of the Proposed Development.</p> <p>Increased lighting as a result of the operation of the Proposed Development.</p>					<p>Significant increase in tree cover and diverse planting as a result of the proposed landscaping plan.</p> <p>Bat sensitive lighting used during Construction and Operational Phases.</p> <p>3+ bat boxes to be installed based on recommendations of bat specialist after pre-felling surveys.</p>	<p>term, imperceptible.</p> <ul style="list-style-type: none"> Increased Construction Phase lighting = Negative, Short-term, Slight. Increased operational lighting = Negative, permanent, slight. 	
Birds									
Bird Assemblages (Red listed)	National importance	<p>Loss and/or damage to some sections of potential nesting habitat during Construction Phase.</p> <p>Nest destruction and mortality if vegetation clearance takes place during the nesting season.</p> <p>Disturbance due to noise generated during Construction Phase.</p>	Negative	Local scale	Permanent	Moderate	Majority of mature trees and boundary treelines to be retained.	<ul style="list-style-type: none"> Loss of habitat = Negative, Short-term, Slight. Increase in tree cover = Positive, Permanent, Moderate. 	
Bird Assemblages (Amber listed)	National importance								Significant increase in tree cover and diverse planting as a result of the proposed landscaping plan.
Bird assemblage (Green listed)	County importance								Avoidance of removal of vegetation during nesting season (see section 5.7.1 for detail).
SCI Waterfowl and shorebirds	International Importance	Impacts to SCI species are addressed in the AA Screening and NIS which accompany this application under separate cover.							

<p>European Eel</p>	<p>National Importance</p>	<p>Potential pollution of 'Duck Pond' containing eel during construction of surface water outfall to Naniken River. Potential pollution of 'Duck Pond' containing eel during Operational Phase.</p>	<p>Negative</p>	<p>Local scale</p>	<p>Short-term Permanent</p>	<p>Significant Slight</p>	<p>Construction related surface water protection measures included to be in the CEMP. Suite of SUDS measures included in the project design (See Section 5.7.6 and EAR report for further detail).</p>	<ul style="list-style-type: none"> • Negative, Imperceptible, Permanent.
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5.9 Monitoring

5.9.1 Construction Phase

5.9.1.1 Bats

As a precautionary measure, it is recommended that the relevant potential bat roost trees, located within the north-western section of the subject lands, are section-felled under the supervision of an experienced ecologist. If bats are present, all works must cease, and NPWS contacted in order to obtain a derogation licence. The CEMP submitted with this planning application provides for a Project Environmental Consultant who will supervise or appoint a suitably qualified person to supervise any work that has potential to involve risk to the environment.

5.9.1.2 Surface water protection measures

The applicant will ensure that monitoring during the Construction Phase will be carried out by a suitably qualified person. This person will specifically ensure that mitigation measures set out in this report are fully implemented, particularly in relation to the protection of the Naniken Stream (i.e., silt fencing condition and supervision of works in or near the stream).

Surface water protection measures e.g., silt fences etc., will be monitored for their effectiveness for the duration of the works. Daily checks may be appropriate during the initial site clearance, during works in the vicinity of the watercourse, and during and after storm events. Weekly or bi-weekly checks may be appropriate at other times.

5.9.2 Operational Phase

5.9.2.1 Badger monitoring programme

Construction Phase

A suitably qualified Badger specialist will be employed prior to the commencement of works on site to survey the Site for badger activity and assess the status of the existing setts.

The specialist will be employed for the duration of the construction Phase and will supervise all works in the vicinity of the existing setts and the artificial sett once constructed. The construction of the artificial sett will also be carried out under the supervision of this specialist in consultation with NPWS.

The specialist will ensure no harm come to badgers during the Construction Phase e.g., exclusion fencing to prevent access to the construction site as required.

A schedule of checks will be drawn up by the specialist to cover the duration of the Construction Phase; to ensure that badger protection measures are in place and working effectively.

Post Construction

A post-construction monitoring programme is proposed for the Site to assess the success (or not) of the mitigation measures relating to badgers. The post construction monitoring will entail the assessment of badger activity at the Site post construction, and the assessment of the success of the artificial sett.

On completion of all works, an inspection of the artificial sett will be carried out to ensure it is accessible and in good repair. It is proposed that inspections be carried out six months and one year after the date of this initial inspection, using camera traps to determine whether the sett is being used and proposing any further remedial measures if relevant. All inspections, monitoring and license applications will be conducted by suitably qualified badger specialist, with reporting to the relevant authorities.

5.9.2.2 European Eel and operational surface water monitoring

A monitoring program will be put in place to survey the 'Duck Pond' for European Eel prior to the commencement of works, to establish a baseline of Eel usage of the pond. The pond will be surveyed again once construction has completed, and the Proposed Development is operational. The timing and frequency of this program of surveys will be agreed with Inland Fisheries Ireland and will be carried out by suitably qualified Ecologists with the appropriate licences from the NPWS as required.

The aim of this monitoring program will be to assess whether the operation of the Proposed Development is having an adverse effect on this European Eel population, through comparisons between the baseline survey results and those post development.

5.10 Interactions

5.10.1 Hydrology

The interactions identified between hydrology and biodiversity are with respect to the potential impact of water pollution on protected areas. This is addressed in further detail in the NIS that accompanies this application under separate cover.

5.10.2 Landscape and Visual

The landscaping proposed for the Site entails the planting of over 700 trees, many of which are native species. This increase in tree cover across the Site will provide additional nesting/foraging resources for local passerines, along with a slight increase in habitat connectivity over what is currently open field habitat.

5.10.3 Land and Soil

An assessment of the potential impact of the Proposed Development on land and soils is outlined in Chapter 6 – Land and Soils. These impacts are considered to be relevant to the ecological sensitivities associated with the Site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are described in full in Chapter 6.

5.10.4 Air Quality and Climate

An assessment of the potential impact of the Proposed Development on Air Quality and Climate is outlined in Chapter 8 - Air Quality and Climate. Designated sites of ecological conservation importance, including SPAs, SACs, NHAs and nature reserves, within 200m of the Affected Road Network (ARN) are required to be included in the air quality assessment. No sites of ecological conservation importance have been identified within 200m of the ARN; therefore, this analysis has been excluded in the current assessment and significant effects

are not expected to occur. Therefore, the impact of the interaction between air quality and climate and biodiversity is insignificant.

5.10.5 Material Assets: Waste and Utilities

An assessment of the potential impact of the Proposed Development on Waste Management is outlined in Chapter 12.2 – Material Assets: Waste and Utilities. These impacts are considered to be relevant to the protection of small mammals which may become entangled or trapped in construction waste in the absence of mitigation, as discussed in this Chapter; and mitigation measures addressing these potential impacts are described in full in Chapter 12.

5.11 Difficulties Encountered When Compiling

No difficulties were encountered in preparing this Chapter.

5.12 References

Aughney, T., Kelleher, C. & Mullen, D. (2008). Bat Survey Guidelines: Traditional Farm Buildings Scheme. The Heritage Council, Áras na hOidhreachta, Church Lane, Kilkenny.

Bang, P. and Dahlstrom, P. (2001). Animal Tracks and Signs, Oxford University Press, Oxford.

Bat Conservation Trust (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). Collins, London.

Bibby, C. J., Burgess, N. D. & Hill, D. A. (1992). Bird Census Techniques. Academic Press, New York.

Blamey, M., Fitter, R. and Fitter, A. (2003). Wild Flowers of Britain and Ireland. London: A & C Black.

Carey, M., Hamilton, G., Poole, A. & Lawton, C. (2007). The Irish Squirrel Survey 2007. COFORD, Dublin.

CIEEM (2015). Guidelines for Ecological Report Writing. Chartered Institute of Ecology and Environmental Management, Winchester, UK.

CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester, UK.

Colhoun, K., Cummins, S. (2013). Birds of Conservation Concern in Ireland. Irish Birds Vol. 9 No. 4.

Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). The Bat Conservation Trust, London.

Curtis, T.G.F. and McGough, H.N. (1988). The Red Data Book 1: Vascular Plants. Dublin: The Stationery Office.

EPA (2002). Guidelines on information to be contained in Environmental Impact Statements. Published by the Environmental Protection Agency, Ireland.

EPA, (2019). Environmental Protection Agency Online Mapping [ONLINE] Available at: <http://www.epa.ie/> [Accessed May 2022].

EPA (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports. Published by the Environmental Protection Agency, Ireland.

Fitzpatrick, Ú., Weekes, L. & Wright M. (2016) Identification Guide to Ireland's Grasses. 2nd Edition. Publish by National Biodiversity Data Centre, Carriganore, Waterford.

Forest Service (2000a). Forest Harvesting and the Environment Guidelines. Department of Agriculture, Fisheries and Food.

Forest Service (2000b). Forest and Water Quality Guidelines. Department of Agriculture, Fisheries and Food.

Fossitt, J. A. (2000). A Guide to Habitats in Ireland. Kilkenny: The Heritage Council.

Gilbert, G. Stanbury, A. and Lewis, L., (2021). Birds of Conservation Concern in Ireland 4: 2020-2026. Irish Birds 43: 1–22.

GSI, (2019). Geological Survey of Ireland website [ONLINE] Available at: <http://www.gsi.ie/> accessed [Accessed May 2022].

Igoe, F., Quigley, D.T.G., Marnell, F., Meskell, E., O' Connor, W. & Byrne, C. (2004). The Sea Lamprey (*Petromyzon marinus* L.), River Lamprey (*Lampetra fluviatilis* L.) and Brook Lamprey (*Lampetra planeri*) (BLOCH) in Ireland: General Biology, Ecology, Distribution and Status with Recommendations for Conservation. *Biology and Environment: Proceedings of the Royal Irish Academy*, 104B(3), 43-56.

Institution of Lighting Professionals (ILP). (2018). Guidance Note 08/18: Bats and artificial lighting in the UK. *Bats and the Built Environment series*. [ONLINE] Available at: <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>

Irish Aviation Authority (2020). Aeronautical Information Publication (AIP) Directory. ENR 5.6 - 1 BIRD MIGRATION AND AREAS WITH SENSITIVE FAUNA. 27 Feb 2020. Online resource available: http://iaip.iaa.ie/iaip/Published%20Files/AIP%20Files/ENR/EI_ENR_5_6_EN.pdf

Irish Water. (2018). Ringsend Wastewater Treatment Plant Upgrade Project Environmental Impact Assessment Report

King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., FitzPatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. and Cassidy, D. (2011). Ireland Red List No. 5: Amphibians, Reptiles and Freshwater Fish. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland

Kingston, N. (2005). Proposed Red Data List for Vascular Plants. A Consultation Document from the National Parks and Wildlife Service, Department of Environment, Heritage and Local Government.

Kelly, F.L., and King, J.J. (2001) A review of the ecology and distribution of three lamprey species, *Lampetra fluviatilis* (L.), *Lampetra planeri* (Bloch) and *Petromyzon marinus* (L.): A context for conservation and biodiversity considerations in Ireland. *Biology and Environment: Proceedings of the Royal Irish Academy* 101B(3), 165-185.

Macklin, R., Brazier, B. & Sleeman, P. (2019). Dublin City otter survey. Report prepared by Triturus Environmental Ltd. for Dublin City Council as an action of the Dublin City Biodiversity Action Plan 2015-2020.

Marnell, F., Looney, D. & Lawton, C. (2019) *Ireland Red List No. 12: Terrestrial Mammals*. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

Marnell, F., Kelleher, C. & Mullen, E. (2022) Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

McAney, K. (2008). A Conservation Plan for Irish Vesper Bats. Irish Wildlife Manual No.20. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government.

Murnane, E., Heap, A., and Swain, A., (2006). Control of water pollution from linear construction projects. Technical guidance. CIRIA C648. Published by CIRIA, UK.

NBDC, (2022). National Biodiversity Data Centre online mapping [ONLINE] Available at: <http://maps.biodiversityireland.ie/Map.aspx>. [Accessed May 2022].

NPWS, (2022). National Parks and Wildlife Service website [ONLINE] Available at: <http://www.npws.ie/en/> [Accessed May 2022].

NRA (2006) Guidelines for the Treatment of Bats during the Construction of National Road Schemes. National Roads Authority (now Transport Infrastructure Ireland), Dublin.

NRA (2009a). Environmental Assessment and Construction Guidelines. National Roads Authority (now Transport Infrastructure Ireland), Dublin.

NRA (2009b). Guidelines for Assessment of Ecological Impacts of National Road Schemes. National Roads Authority (now Transport Infrastructure Ireland), Dublin.

Lundy M.G., Aughney T., Montgomery W.I., Roche N. (2011) Landscape conservation for Irish bats & species specific roosting characteristics. Bat Conservation Ireland.

O'Mahony, D., Turner, P, O'Reilly, C. (2012). Pine marten (*Martes martes*) distribution and abundance in Ireland: A cross-jurisdictional analysis using non-invasive genetic survey techniques. *Mammalian Biology*, 77 (5), 351-357.

Preston, C. D., Pearman, D. A., and T.D. Dines (2002). *New Atlas of the British and Irish Flora*. Oxford University Press.

Reid, N., Dingerkus, K., Montgomery, W.I., Marnell, F., Jeffrey, R., Lynn, D., Kingston, N. & McDonald, R.A. (2007). Status of hares in Ireland. Irish Wildlife Manuals, 30. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government.

Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013). National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Reynolds, J. D. (2007) Conservation Assessment of the white-clawed crayfish *Austropotamobius pallipes* (Lereboullet, 1858) in Ireland. Conservation Status Assessment Report. National Parks and Wildlife Service.

Scott Cawley Ltd. (2017a). Natura Impact Statement for Proposed Residential Development at St. Paul's College, Sybil Hill, Raheny, Dublin 5.

Scott Cawley Ltd. (2017b). Provision of Information regarding Appropriate Assessment Screening for Proposed Development at St. Paul's College, Sybil Hill, Raheny, Dublin 5.

Sleeman, D. (1993). Habitats of the Irish Stoat. *The Irish Naturalists' Journal*, 24(8), 318-321.

Smith, G.F., O'Donoghue, P, O'Hora K., and Delaney, E. (2010). Best Practice Guidance for Habitat Survey and Mapping. Published by the Heritage Council.

6 LAND AND SOIL

6.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) provides an assessment of the impact that the proposed mixed-use development at Foxlands in Raheny, Dublin 5 will have on the surrounding soil and geology in the vicinity of the site. It also sets out mitigation and remedial measures and methods of monitoring once the development is operational. It also sets out mitigation and remedial measures and methods of monitoring while the development is operational.

A full description of the development can be found in Chapter 2: Description of Proposed Development of this EIAR.

This chapter was completed by Waterman Moylan Consulting Engineers.

6.2 Study Methodology

A desktop study to classify the geological features related to the site was undertaken. Data from the Geological Survey of Ireland (GSI) was reviewed, including the following maps:

- Bedrock Geology Map
- Bedrock Aquifer Map
- Ground Water Vulnerability Map

This information was supplemented by a review of geotechnical Site Investigations carried out within the site by Ground Investigations Ireland Ltd. in September and October 2015. This ground investigation assessed the soil, rock and groundwater conditions across the site and included 10 no. cable percussion boreholes to a maximum depth of 8.0m below ground level, standpipe installations and groundwater monitoring, and laboratory testing of representative soil samples.

6.3 The Existing and Receiving Environment (Baseline Situation)

The subject site is located in Raheny, Dublin 5. It is bounded by St. Anne's Park to the north, east and south, and by St. Paul's Secondary School and a residential street known as The Meadows to the west.

The site is a greenfield site. Topographic survey data indicates that the site falls generally from west to east, with a high point of approximately 25.5m OD Malin at the west of the site and a low point of approximately 21.4m OD Malin at the south-eastern corner of the site.

The site falls within the catchment of the Naniken River, located approximately 100m north of the site. Although it is culverted further upstream of the site, the Naniken River is visible for its entire lower course where it flows through St. Anne's Park. The river discharges via a culvert beneath the James Larkin Road (R807) to the sea between North Bull Island and the mainland.

6.3.1 Desktop Study

Geological Survey Ireland (GSI) produces a wide range of datasets, including bedrock geology mapping, extracted in the Figure below:



Figure 6-1: Extract from GSI Bedrock Geology Map

From the GSI bedrock map, extracted above, the subject site lies within the Lucan Formation, which covers much of Dublin. This 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 beds are predominantly fine-grained distal turbidites in the north Dublin Basin, and the formation ranges from 300m to 800m in thickness.

The National Aquifer Bedrock Map prepared by the Geological Survey of Ireland was also consulted and is extracted below:

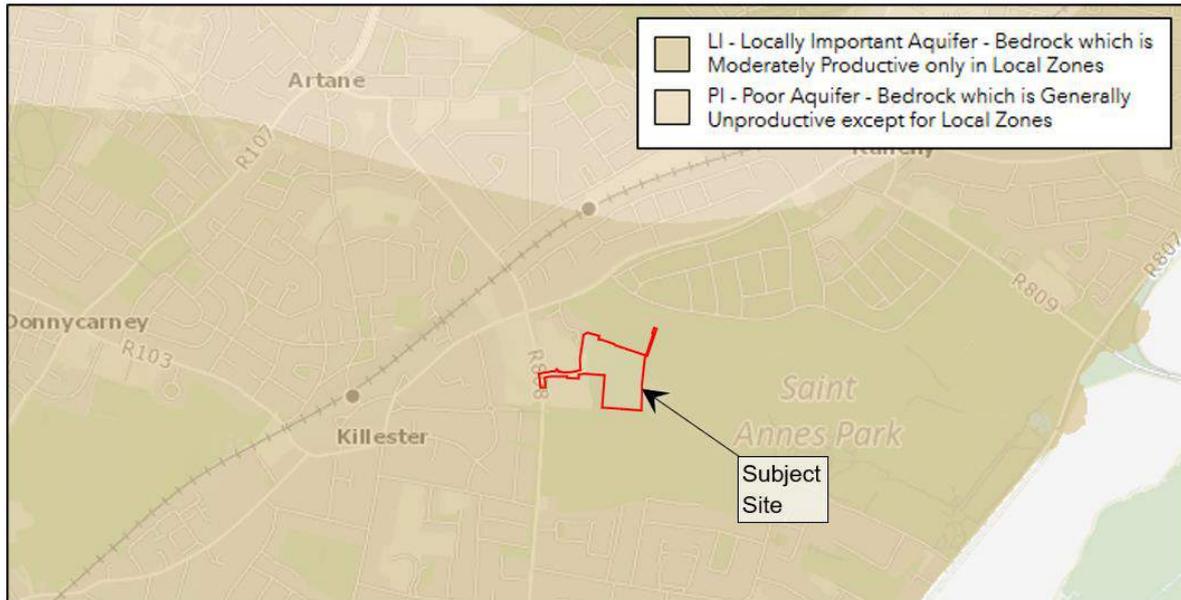


Figure 6-2: Extract from GSI Groundwater Aquifer Map

From this map, it was established that the entirety of the site is within the designation LI, which represents locally important moderately productive aquifer.

From the GSI groundwater vulnerability map, extracted below, the vulnerability of the aquifer in the vicinity of the proposed site is low:

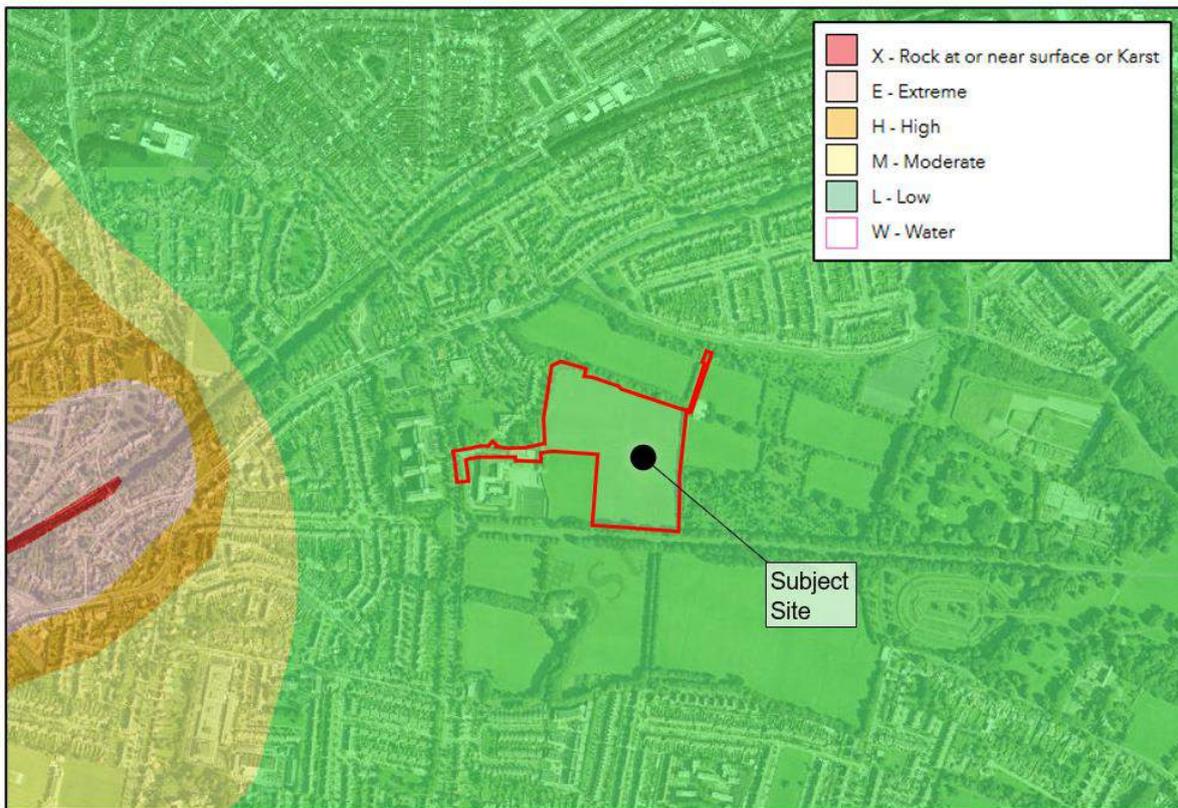


Figure 6-3: Extract from GSI Groundwater Vulnerability Map

6.3.2 Ground Investigations

Intrusive ground investigations were carried out at the site by Ground Investigations Ireland Ltd. in September and October 2015. The scope of the site investigation works carried out at the site comprised the following:

- 10 No. Cable Percussion boreholes were drilled to a maximum depth of 8.0m below ground level using a Dando 2000 drilling rig with regular in-situ testing and sampling undertaken to facilitate the production of geotechnical logs and laboratory testing.
- Disturbed samples were taken from the boring tools at suitable depths, so that there is a representative sample at the top of each change in stratum and thereafter at regular intervals down the borehole until the next stratum was encountered. The disturbed samples were then sealed and sent to the laboratory where they were visually examined to confirm the description of the relevant strata.
- Standard Penetration Tests were carried out in the boreholes.
- Standpipe installations and groundwater monitoring to allow the equilibrium groundwater level to be determined.
- Samples were selected from the boreholes for a range of geotechnical classification laboratory testing to provide information for the proposed design.

The locations of the 10 No. boreholes are indicated on the Figure 6-4, circled in red for clarity



Figure 6-4: Site Investigation Locations

The sequence of strata encountered were consistent across the site and are generally consisted of;

- Made Ground
- Cohesive Deposits

Made Ground deposits were encountered beneath the ground surface or Topsoil and were present to depths of between 0.8 and 1.5m BGL in the boreholes. These deposits were described generally consisted of brown/grey sandy gravelly CLAY.

Stiff brown cohesive deposits were present below the Made Ground deposits in the boreholes and were typically described as brown sandy gravelly CLAY with occasional cobbles. This stratum was present to a depth of up to 2.3m BGL and was underlain by a stiff to very stiff black slightly sandy gravelly CLAY with occasional cobbles and boulders to a maximum depth of 8.0m BGL.

Groundwater strikes were generally not encountered during the investigation in the cohesive deposits. However, it is noted that the exploratory holes did not remain open for sufficiently long periods of time to establish the hydrogeological regime and groundwater levels would be expected to vary with the time of year, tidal influence, rainfall, nearby construction and other factors.

To better understand the hydrogeological regime and groundwater levels, standpipes were installed in BH1, BH2, BH3, BH6 and BH9. This allowed for the equilibrium groundwater level to be determined, as tabulated in Table 6-1:

Table 6-1: Groundwater Monitoring Levels

Borehole	Date	Groundwater	
		m BGL	m OD
BH1	19/10/2015	1.08	23.772
BH2	19/10/2015	1.79	20.699
BH3	19/10/2015	2.17	19.773
BH6	19/10/2015	Dry	-
BH9	19/10/2015	2.40	19.021

An allowable bearing capacity of 150kN/m² is recommended for the stiff brown cohesive deposits below the made ground depths of 0.80 – 1.50m below ground level. An allowable bearing capacity of 300kN/m² is recommended for deeper foundations based on the stiff black cohesive deposits. Excavations in the areas where deeper Made Ground deposits were encountered may require to be appropriately battered or the sides supported due to the variable strength of these deposits.

The full Site Investigation report is included as Appendix I to this report.

6.4 Characteristics of the Proposed Development

The Proposed Development consists of the construction of a residential and nursing home development set out in 7 no. blocks, ranging in height from 4 to 7 storeys, to accommodate 580 no. apartments, residential tenant amenity spaces, a crèche and a 100-bed nursing home, as set out in the schedule of accommodation (Table 6-2):

Description		1-Bed	2-Bed	3-Bed	Total
Apartment Blocks	Block A	31	25	5	61
	Block B	44	26	-	70
	Block C	46	57	9	113
	Block D	56	58	22	136
	Block E	47	46	3	96
	Block F	23	9	4	36
Mixed-Use (Block G)	Apartments	25	27	17	69
	Nursing Home	100 Bed-Spaces			-
	Crèche	6 Classrooms			-
Total		272	248	60	580

Table 6-2: Schedule of Accommodation

The proposal includes basement, podium and surface car parking with vehicular and pedestrian access from Sybil Hill Road, via a proposed new access road.

The development will include all associated site development works, landscaping and boundary treatment, cycle parking, bin stores, substation, drainage and service connections.

The proposed development, with respect to soils and geology, includes the following characteristics: -

- Stripping of topsoil.
- Excavation of foundations and basements.
- Excavation of drainage sewers and utilities.
- Regrading and landscaping.
- Disposal of any surplus excavated soils including any contaminated material.

6.5 Potential Impact of the Proposed Development

6.5.1 Construction Phase

The removal of topsoil during earthworks and the construction of roads, services and buildings, in particular basements and foundations, will expose subsoil to weathering and may result in the erosion of soils during adverse weather conditions. Surface water runoff from the surface of the excavated areas may result in silt discharges to the Naniken River.

Excavations for basements, foundations, roadworks and services will result in a surplus of subsoil. Surplus subsoil will be used in fill areas where applicable.

Dust from the site and from soil spillages on the existing road network around the site may be problematic, especially during dry conditions.

Accidental oil or diesel spillages from construction plant and equipment, in particular at refuelling areas, may result in oil contamination of the soils and underlying geological structures.

6.5.2 Operational Phase

During the operational stage of the Proposed Development, it is not envisaged that there will be any ongoing impacts on the underlying soil as a result of the proposed development. Any hydro-geological impacts are temporary and associated with the construction of the proposed development.

6.5.3 “Do Nothing” Impact

There is no impact on the soils and geology in the do-nothing scenario.

6.6 Avoidance, Remedial & Mitigation Measures

6.6.1 Construction Phase

To reduce the quantity of soil to be removed from or imported into the site, the floor levels of the proposed buildings and roads are designed to match existing levels as closely as is feasible, to minimise the cut and fill balance. The number of vehicle movements offsite will be minimised by this optimisation. However, given that there are two large basements proposed, it is anticipated that there will be a surplus of soil to be removed from the site.

Surplus subsoil and rock that may be required to be removed from site will be deposited in approved fill areas or to an approved waste disposal facility. Surplus subsoil will be stockpiled on site, in such a manner as to avoid contamination with builders' waste materials, etc., and so as to preserve the materials for future use as clean fill. A Construction Management Plan will need to include protocols for soil removal and should be implemented by the development's main contractor during the construction stage.

Soil samples taken from the site during the site investigations showed no evidence of contamination. However, any contaminated soils that are encountered during the works will be excavated and disposed of off-site in accordance with the Waste Management Act 1996, as amended, and associated regulations and guidance provided in Guidelines for the Management of Waste from National Road Construction Projects published by the National Roads Authority in 2008.

In the case of topsoil, careful planning and on-site storage can ensure that this resource is reused on-site as much as possible. Any surplus of soil not reused on site can be sold. However, topsoil is quite sensitive and can be rendered useless if not stored and cared for properly. It is therefore important that topsoil is kept completely separate from all other construction waste, as any cross-contamination of the topsoil can render it useless for reuse.

It is important to ensure that topsoil is protected from all kinds of vehicle damage and kept away from site-track, delivery vehicle turning areas and site plant and vehicle storage areas.

If topsoil is stored in piles of greater than two metres in height, the soil matrix (internal structure) can be damaged beyond repair. It should also be kept as dry as possible and used as soon as possible to reduce any deterioration through lengthy storage and excess moving around the site.

Records of topsoil storage, movements and transfer from site will be kept by the C&D Waste Manager.

The provision of wheel wash facilities at the construction entrance to the development will minimise the amount of soils deposited on the surrounding road network. The adjoining road network will be cleaned on a regular basis, as required, to prevent the build-up of soils from the development site on the existing public roads. Dampening down measures with water sprays will be implemented during periods of dry weather to reduce dust levels arising from the development works.

Measures will be implemented throughout the construction stage to prevent contamination of the soil and adjacent watercourses (in particular the Naniken River) from oil and petrol leakages. Suitable bunded areas will be installed for oil and petrol storage tanks. Designated fuel filling points will be put in place with appropriate oil and petrol interceptors to provide protection from accidental spills. Refuelling will be restricted to these allocated re-fuelling areas. This area is to be an impermeable bunded area designed to contain 110% of the volume of fuel stored.

During excavation works, temporary sumps will be used to collect any surface water run-off thereby avoiding standing water within the excavations. If groundwater is encountered during excavations, mechanical pumps will be required to remove the groundwater from sumps. Sumps should be carefully located and constructed to ensure that groundwater is efficiently removed from excavations and trenches.

Silt traps, silt fences and tailing ponds will need to be provided by the contractor where necessary to prevent silts and soils being washed away by heavy rains during the course of the construction stage. Surface water runoff and water pumped from the excavation works will be discharged via a silt trap / settlement pond to the existing foul drainage network. Straw bales will be used at the outfall to filter surface water to remove contaminants.

After implementation of the above measures, the proposed development will not give rise to any significant long term adverse impact. Moderate negative impacts during the construction stage will be short term only in duration.

A Construction Management Plan, Traffic Management Plan and Waste Management Plan will be implemented by the contractor during the construction stage to control the above remedial measures.

6.6.2 Operational Phase

On completion of the construction phase and following replacement of topsoil, a planting programme will commence to prevent soil erosion. Sustainable Drainage Systems (SuDS) and filtration devices are proposed to be provided as part of the development. These will help to remove pollutants from rainwater runoff. The SuDS proposals will also encourage infiltration of surface water to the ground.

6.7 Residual Impacts

6.7.1 Construction Phase

With the protective measures noted above in place during excavation works, any potential impacts on soils and geology in the area will not have significant adverse impacts, and no significant adverse impacts on the soils and geology of the subject lands are envisaged.

The proposed development will result in a surplus of excavated material, which may contain contaminants. Any contaminated material will be exported to an approved licensed waste facility.

6.7.2 Operational Phase

On completion of the construction phase and following replacement of topsoil and implementation of a planting programme, no further impacts on the soil are envisaged.

SuDS measures, including permeable paving, bioretention tree pits and open areas with low level planting, will assist with treating surface water runoff while replenishing the natural ground water table.

No significant adverse impacts are predicted on soils or geology.

6.7.3 “Worst Case” Scenario

The worst case scenario would be for contaminated soils to be encountered during the works. As noted above, any contaminated soils encountered will be excavated and disposed of off-site in accordance with the Waste Management Act 1996, as amended, and associated regulations and guidance provided in Guidelines for the Management of Waste from National Road Construction Projects published by the National Roads Authority in 2008.

In the worst case scenario, subsoil may be exposed to inclement weather during construction and may result in the erosion of soils. However, with the proposed mitigation measures the quantity of soils exposed and the duration of that exposure will be minimised.

6.8 Monitoring

6.8.1 Construction Phase

Monitoring during the construction phase is recommended, in particular in relation to the following:

- Adequate protection of topsoil stockpiled for reuse.
- Adequate protection from contamination of soils for removal.
- Monitoring of surface water discharging to existing watercourses, ditches and the Naniken River.
- Monitoring cleanliness of the adjoining road network.
- Monitoring measures for prevention of oil and petrol spillages.
- Dust control by dampening down measures close to the boundaries of the site, when required due to unusually dry weather conditions.

6.8.2 Operational Phase

During the operational phase, the surface water network (drains, gullies, manholes, Access Junctions (AJs), SuDS devices, attenuation system) will need to be regularly maintained and where required cleaned out. A suitable maintenance regime of inspecting and cleaning should be incorporated into the safety file/maintenance manual for the development.

6.9 Reinstatement

Excavations and trenches opened during construction will be backfilled with subsoil to reinstate existing ground levels. Upon completion no impact is foreseen.

6.10 Interactions

The interactions between Chapter 7 (Land and Soils) and the other chapters of the EIAR are set out below:

6.10.1 Population & Human Health

Dust from the site and from soil spillages on the existing road network around the site may impact human health, especially during dry conditions. Dampening down measures with water sprays will be implemented during periods of dry weather to reduce dust levels arising from the development works.

6.10.2 Water

Accidental oil or diesel spillages from construction plant and equipment, in particular at refuelling areas, may result in oil contamination of the soils and underlying geological structures, including surface water and groundwater. Measures will be implemented throughout the construction stage to prevent contamination of the soil and adjacent watercourses from oil and petrol leakages.

6.10.3 Climate (Air Quality & Climate Change)

Dust from the site and from soil spillages on the existing road network around the site may impact air quality, especially during dry conditions. Dampening down measures with water sprays will be implemented during periods of dry weather to reduce dust levels arising from the development works.

Air Quality will be controlled and monitored as set out in Chapter 8 of this EIAR.

6.10.4 Air (Noise & Vibration)

Heavy machinery used for excavations may impact on noise and vibration. Both will be controlled and monitored as set out in Chapter 9 of this EIAR.

6.10.5 Waste Management

Excess soil excavated during construction works, including any potential contaminated soils, will be managed and disposed of in approved locations as provided for in this EIAR.

6.10.6 Biodiversity

Accidental oil or diesel spillages from construction plant and equipment may impact local flora and fauna. Such spills will be mitigated in accordance with Chapter 6 of this EIAR.

6.10.7 Material Assets (Transport)

Excess soil excavated during construction works for the development will be transported by road for disposal in approved locations as provided for in this EIAR. Movements of construction traffic will be managed in accordance with the Construction Traffic Management Plan.

6.11 Difficulties Encountered When Compiling

There were no difficulties encountered when undertaking this assessment.

6.12 References

The following documents and sources were consulted during the preparation of Chapter 6:

- Geological Survey Ireland (GSI) Public Data Mapping;
- Ground Investigations Ireland Ltd.'s Site Investigation Report;
- EPA's Guidance on waste acceptance criteria at authorised soil recovery facilities;
- Waste Management Act 1996, as amended;
- NRA's Guidelines for the Management of Waste from National Road Construction Projects; and
- European Union Waste Management (Environmental Impact Assessment) Regulations 2020 S.I. 130 of 2020.

In addition to the sources listed above, design information from the other members of the project team was incorporated in Chapter 6 (Land and Soil).

7 WATER (HYDROLOGY AND HYDROGEOLOGY)

7.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) provides a description of the hydrology and hydrogeology (water) environment within and immediately surrounding the Site of the Proposed Development and an assessment of the potential impacts of the Proposed Development on hydrology and hydrogeology and sets out any required mitigation measures where appropriate.

The principal objectives of this chapter are to identify:

- Hydrological and hydrogeological characteristics of the receiving environment at the Proposed Development Site;
- Potential impacts that the Proposed Development may have on the receiving water environment;
- Potential constraints that the environmental attributes may place on the Proposed Development;
- Required mitigation measures which may be necessary to minimise any adverse impacts related to the Proposed Development; and
- Evaluate the significance of any residual impacts.

7.1.1 Quality Assurance and Competence

Synergy Environmental Ltd., T/A Enviroguide Consulting, is a wholly Irish Owned multi-disciplinary consultancy specialising in the areas of the Environment, Waste Management and Planning. All of our consultants carry scientific or engineering qualifications and have a wealth of experience working within the Environmental Consultancy sectors, having undergone extensive training and continued professional development.

Enviroguide Consulting as a company remains fully briefed in European and Irish environmental policy and legislation. Professional memberships include the Institute of Geologists of Ireland (IGI), Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association and Chartered Institute of Ecology and Environmental Management (CIEEM).

This EIAR Chapter was written by Candice Serbu BSc., MSc., Consultant with Enviroguide Consulting and Claire Clifford BSc., MSc., PGeo., EurGeol who is Technical Director - Contaminated Land and Hydrogeology with Enviroguide Consulting and is a Professional Geologist with the Institute of Geologists of Ireland and has extensive experience in preparing hydrogeological and environmental assessments for a range of project types and geological and hydrogeological site settings.

7.1.2 Description of the Proposed Development

Raheny 3 Limited Partnership are applying for permission for development on lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5. The site is bound to the north, east and south by St Anne's Park and to the west by residential development at The Meadows, Sybil Hill House (a Protected Structure) and St Paul's College. Vehicular access to the site is from Sybil Hill Road.

The Proposed Development consists of the construction of a residential and nursing home development set out in 7 no. blocks, ranging in height from 4-7 storeys to accommodate 580 no. apartments, residential tenant amenity spaces, a crèche and a 100-bed nursing home. The site will accommodate car parking spaces, bicycle parking spaces, storage, services and plant areas at both basement and podium level.

Landscaping will include extensive communal amenity areas, and a significant public open space provision on the east and south of the site. The proposed application includes all site landscaping works, green roofs, substations, boundary treatments, lighting, servicing, signage, surface water attenuation facilities and associated and ancillary works, including site development works and services above and below ground. For a full description of the Proposed Development please refer to the Statutory Notices.

A detailed description of the aspects of the Construction and Operational Phases of the Proposed Development and relevant to the hydrological and hydrogeological environment is provided in Section 7.4.

7.2 Study Methodology

7.2.1 Regulations and Guidelines

The methodology adopted for the assessment has regard to the relevant guidelines and legislation including:

- Council Directive 2006/118/EC, 2006. On the protection of groundwater against pollution and deterioration. European Parliament and the Council of European Communities (Groundwater Directive (GWD)).
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy as amended by Directives 2008/105/EC, 2013/39/EU and 2014/101/EU (Water Framework Directive, WFD);
- Local Government (Water Pollution) Acts 1977 to 2007
- Water Services Act 2007 (No. 30/2007)
- Local Government, March 1977. No. 01/1977. Local Government (Water Pollution) Act, 1977.
- Local Government, July 1990. No. 21.1990. Local Government (Water Pollution) (Amendment) Act, 1990.
-
- S.I. No. 722/2003 – European Communities (Water Policy) and as amended
- S.I. No. 489/2011 – European communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011.
- S.I. No. 122/2010 – European Communities (Assessment and Management of flood Risks) Regulations 2010 including amendment S.I. No. 495/2015.
- S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 and as amended.
- S.I. No. 9 of 2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 and as amended

Other guidance used in the assessment of potential impacts on the receiving water environment are referenced where relevant in this EIAR Chapter and includes

- Construction Industry Research and Information Association, 2001. Control of Water Pollution from Construction Sites (CIRIA – C532).
- Construction Industry Research and Information Association, 2015. Environmental good practice on site guide (CIRIA – C741).
- Construction Industry Research and Information Association, 2016. Groundwater control: design and practice (CIRIA – C750).
- Department of the Environment, Heritage and Local Government, Environmental Protection Agency and Geological Survey of Ireland, 1999. Groundwater Protection Schemes (DEHLG/EPA/GSI, 1999);
- Department of the Environment, Heritage and Local Government, 2009. Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG, 2009);
- Department of Housing, Planning and Local Government, August 2018. Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DHPLG, 2018)
- Environmental Protection Agency, 2014. Guidance on the Authorisation of Discharges to Groundwater.
- Environmental Protection Agency, 2013. Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites.
- Environmental Protection Agency, 2004. Storage and Transfer of Materials for Scheduled Activities
- Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- Institute of Geologists of Ireland Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013);
- National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009);
- National Roads Authority, 2007 Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan (undated) in relation to impact mitigation; and
- OPR, June 2021. OPR Practice Note PN02. Environmental Impact Assessment Screening (OPR, 2021).
- WFD Working Group, 2005. Guidance on the Assessment of the Impact of Groundwater Abstractions (WFD, 2005).

7.2.2 Phased Approach

A phased approach was adopted for this EIAR in accordance with Environmental Protection Agency (EPA) and Institute of Geologists of Ireland (IGI) guidelines as set out above and is described in the following sections.

Element 1: An initial Assessment and Impact Determination stage was carried out by Enviroguide Consulting to establish the project location, type and scale of the Proposed Development, the baseline conditions, and the type of hydrological and hydrogeological environment, to establish the activities associated with the Proposed Development and to undertake an initial assessment and impact determination.

This stage of the assessment included a desktop study that comprised a review of published environmental information for the Proposed Development Site. The study area, for the purposes of assessing the baseline conditions for the Hydrology and Hydrogeology Chapter of the EIAR, extends beyond the Site boundaries and includes potential receptors within a 2.0km radius of the Proposed Development Site. Based which is based on the Institute of Geologists of Ireland (IGI) Guidelines (IGI, 2013) recommended recommended distance of 2.0km radius from the Proposed Development Site. Potential receptors outside of the 2.0km radius with a hydraulic connection to the Proposed Development Site were also included in the assessment that were identified on the basis of the Conceptual Site Model (CSM) and Source-Pathway-Receptor (S-P-R) model. The CSM and S-P-R approach underpins the Directive 2000/60/EC (Water Framework Directive; WFD) *amended by Directives 2008/105/EC, 2013/39/EU and 2014/101/EU* that has been transposed to Irish legislation as European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) as amended, as well as EPA guidelines on the protection of groundwater and surface water resources including 'Guidance on the Authorisation of Discharges to Groundwater' (EPA, 2014).

The desk study involved collecting all the relevant data for the Proposed Development site and surrounding area including published information and details pertaining to the Proposed Development provided by the Applicant and design team.

The Element 1 stage of the assessment was completed by Enviroguide Consulting and included the review of the following sources of information:

- Environmental Protection Agency (EPA) webmapping (EPA, 2022);
- Geological Survey Ireland (GSI) Datasets Public Viewer and Groundwater webmapping (EPA, 2022);
- National Parks and Wildlife Services (NPWS) webmapping (NPWS, 2022);
- Ordnance Survey Ireland (OSI) webmapping (OSI, 2022);
- Water Framework Directive Ireland (WFD) webmapping (WFD, 2022);
- Teagasc webmapping (Teagasc, 2022);
- Office of Public Works (OPW) database on historic flooding and the Catchment Flood Risk Assessment and Management (CFRAM) maps (OPW, 2022); and
- Information provided by the Applicant pertaining to the Proposed Development including design drawings, design reports and relevant site investigation reports included with the planning application and referenced within this chapter where appropriate.

Element 2: Direct and Indirect Site Investigation and Studies stage was not carried out specifically for this EIAR Chapter as it was deemed that there was adequate valid information from the site investigations and assessments previously completed for the Site that were reviewed during Element 1. This site investigation information is considered valid for this assessment as there has been no material changes in the receiving environments or in the

nature of the Proposed Development which would require an undated assessment to be carried out.

Element 3: Evaluation of Mitigation Measures, Residual Impacts and Final Impact Assessment were based on the outcome of the information gathered in Element and Element 2. Mitigation measures to address all identified adverse impacts that were identified in Element 1 of the assessment were considered in relation to the Construction and Phase and Operational Phase of the Proposed Development. These mitigation measures were then considered in the impact assessment to identify any residual impacts.

Element 4: Completion of the Hydrology and Hydrogeology sections of the EIAR in this Chapter which includes all the associated figures and documents.

7.2.3 Description of Importance of the Receiving Environment

The National Roads Authority (NRA) criteria for estimation of the importance of hydrogeological features at the Proposed Development Site during the Environmental Impact Assessment (EIA) stage, as documented by IGI (IGI, 2013) are summarised in Table 7-1.

Table 7-1 Criteria for Rating Site Importance of Hydrogeological Features (IGI,2003)

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

7.2.4 Description and Assessment of Potential Impact

Impacts will vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this Chapter as documented by the EPA (EPA, 2022) are described in Table 7-2.

Table 7-2 Assessment of Potential Impacts Terminology and Methodology (EPA, 2022)

Quality of Effects / Impacts	Definition
Negative	A change which reduces the quality of the environment
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment
Significance of Effects / Impacts	Definition
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	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration, or intensity significantly alters a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.
Duration of Effects / Impacts	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

7.3 The Existing and Receiving Environment (Baseline Situation)

7.3.1 Site Location and Description

The 6.7 ha site is located in Raheny, Dublin 5. The site is bounded by St. Anne's Park to the north, east and south and by St. Paul's Secondary School and a residential street known as The Meadows to the west. The site location is shown in Figure 7-1.

Table 7-4 Average Potential Evapotranspiration (Met Eireann, 2022)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
11.4	26.3	37.8	52.8	75.6	90.5	91.0	63.7	47.2	31.9	14.8	11.0	554.0
Note: 1km x 1km Irish Grid Coordinates selected for the Proposed Development Site = X (Easting): 328000, Y (Northing):239000												

The average annual PE at the Proposed Development Site is 554.0mm/year (Met Eireann, 2022) (refer to Table 7.4). The GSI (GSI, 2022) have calculated an effective Rainfall (ER) value of 268.600mm/year for the Site with a recharge coefficient of 7.50%.

7.3.4 Soil, Geology

7.3.4.1 Regional Geology

Details of the soil and geology at the Site are provided in Chapter 6 of this EIAR and are summarised below.

Teagasc Soils beneath the Site are mapped as being mainly comprised of Till Derived Chiefly from Limestone with Made Ground in the western section of the Site (GSI, 2022). Quaternary sediments beneath the Site are described as Till derived from Limestones (TLs) (GSI, 2022).

The bedrock beneath the Site is mapped as being underlain by the Lucan Formation described as dark-grey to black, fine grained, occasionally cherty, micritic limestone that weather paler, usually to pale grey (GSI, 2022).

7.3.4.2 Site Investigation Results

Site investigation (Ground Investigations Ireland Ltd., 2015) was completed at the Site and included installation of ten (10no) cable percussion boreholes to depths between 5.6m below ground level (mbGL) and 8.5mbGL. The geology encountered is summarised in the Site Investigation Report (Ground Investigations Ireland Ltd., 2015. Refer to Appendix I) as follows:

'Made Ground Deposits: *Made Ground deposits were encountered beneath the ground surface or Topsoil and were present to a depths of between 0.8 and 1.5m BGL in the boreholes. These deposits were described generally consisted of brown/grey sandy gravelly CLAY.*

Cohesive Deposits: *Stiff brown cohesive deposits were present below the Made Ground deposits in the boreholes and were typically described as brown sandy gravelly CLAY with occasional cobbles. This stratum was present to a depth of up to 2.3m BGL and was underlain by a stiff to very stiff black slightly sandy gravelly CLAY with occasional cobbles and boulders to a maximum depth of 8.0m BGL.'*

Bedrock was not encountered in the boreholes installed as part of the site investigation (Ground Investigations Ireland Ltd., 2015).

Soil sample analytical data contained in Appendix 3 of the Site Investigation Report (Ground Investigations Ireland Ltd., 2015. Refer to Appendix I) for 11 samples collected at depths ranging from 0-1.0m to 3.0-4.0m indicates that the soil at the Site is generally free of anthropogenic type contamination with the exception of trace concentrations of petroleum hydrocarbons (TPH CWG) at two locations. The reported TPH CWG (petroleum

hydrocarbons) concentrations were 119mg/kg (BH1 1.0-2.0m) and 187mg/kg (BH3 2.0m) for samples collected at the northwest corner and northeast corner of the Site respectively.

The reported analytical results indicate that the soil is generally free from anthropogenic contamination and the trace TPH concentrations reported are not indicative of heavily contaminated soil source at the Site. All other analysed parameters including Polycyclic Aromatic Hydrocarbons (PAH 17 total), Polychlorinated Biphenyls (PCBs) and BTEX (benzene, toluene, ethylbenzene and xylene) were reported as less than limits of laboratory detection (i.e., not detected).

7.3.5 Regional Hydrogeology

7.3.5.1 Groundwater Body

The bedrock aquifers beneath the Proposed Development Site are within the Dublin GWB (EU Code: IE_EA_G_008) (EPA, 2022). The Dublin GWB covers 837km² and occupies an area across Co. Dublin, Co. Kildare and Co. Meath (GSI, 2022).

Dublin City is highly urbanized with made ground and impermeable cover which limits recharge to the bedrock. The GSI description of the Dublin GWB identifies that the dominant recharge process will be diffuse recharge from water percolating through the subsoils and into the aquifer with recharge in the Dublin City area of the groundwater body occurring through infiltration in open areas such as parks, squares and gardens with some recharge occurring through leaking from sewers, mains and storm drains. Due to generally low permeability of the aquifers within Dublin Urban GWB, a high proportion of the recharge will run off and discharge rapidly to surface watercourses via the upper layers of the aquifer.

Dublin Urban GWB is at risk due to point and diffuse sources of pollution which are normally found in an urban environment such as contaminated land and leaking sewer networks.

Regional groundwater flow is towards Dublin Bay and the Irish Sea to the east (GSI, 2022).

7.3.5.2 Recharge

The GSI has calculated the average annual recharge for the aquifer beneath the Proposed Development Site as 20mm/year based on effective rainfall (ER) value of 268.600mm/year and a recharge coefficient of 7.50% (GSI, 2022). This low recharge potential is due to the presence of low permeability subsoil mapped beneath the Site.

7.3.5.3 Aquifer Classification and Vulnerability

The bedrock aquifer within the Lucan Formation beneath the Site is classified by the GSI (2022) as a Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones. There are no gravel aquifers mapped within 2km radius of the Site.

The Groundwater Vulnerability Rating assigned to groundwater within the bedrock aquifer beneath the Site is Low (GSI, 2022).

The bedrock aquifer classification and groundwater vulnerability rating maps are provided in Figure 7-2 and Figure 7-3.

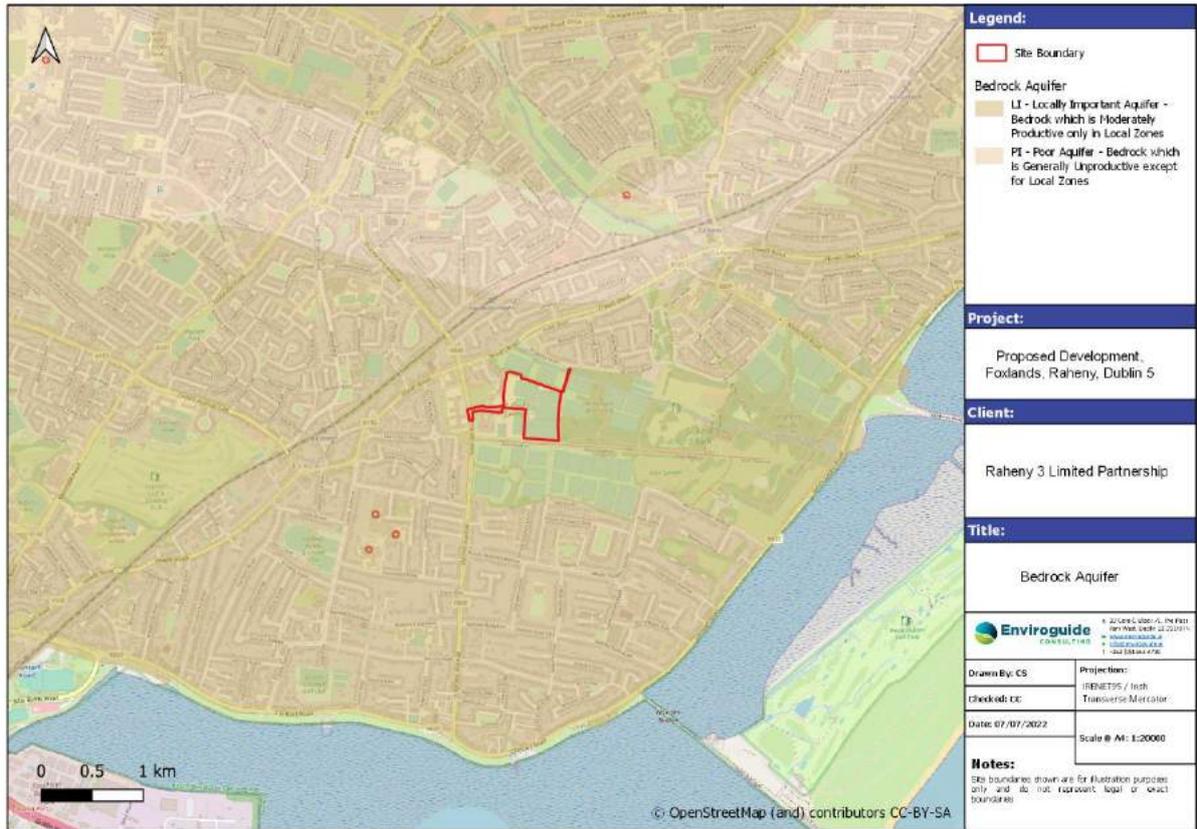


Figure 7-2 Aquifer Classification (Source: GSI, 2022)

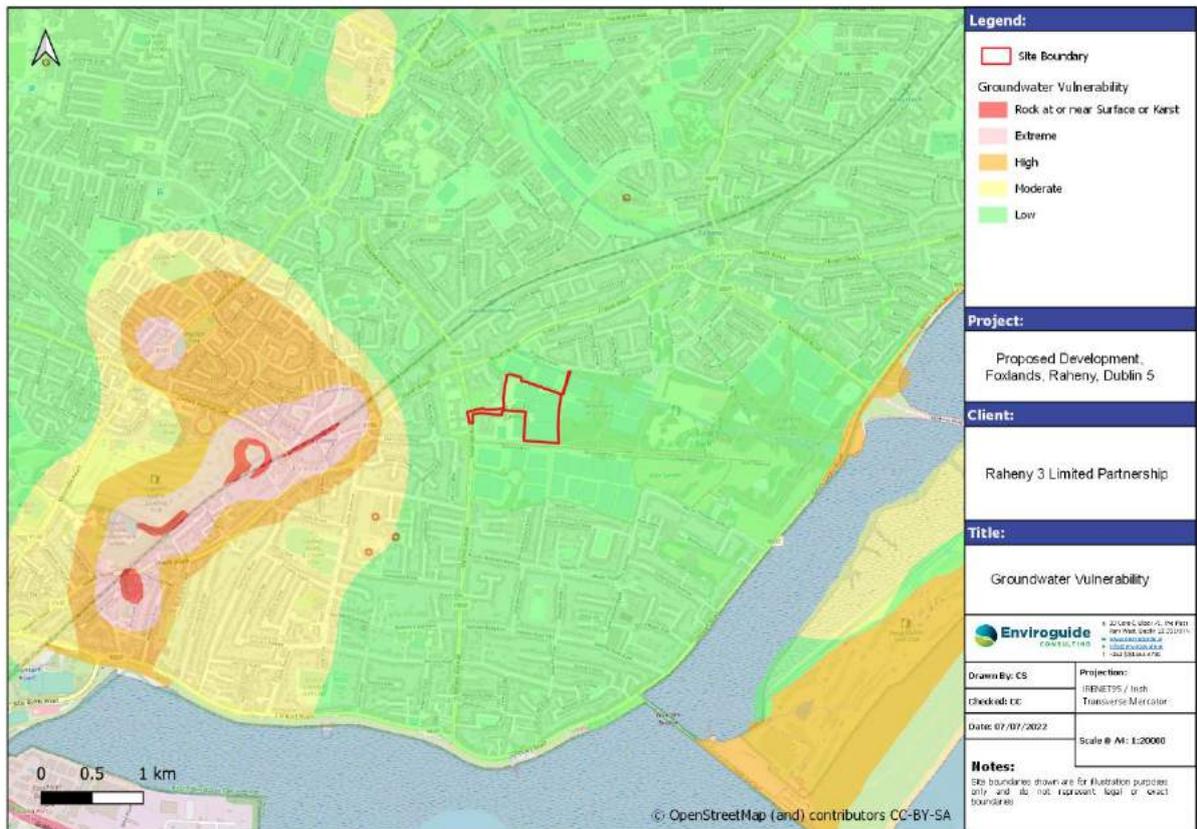


Figure 7-3 Groundwater Vulnerability (Source: GSI, 2022)

7.3.6 Site Hydrogeology and Groundwater Levels

Groundwater strikes were generally not encountered within cohesive deposits during drilling with strikes recorded at three of the ten boreholes at depths ranging from 5.6mbGL (BH1) to 8.0mbGL (BH3 and BH10) . Groundwater monitoring standpipes were installed in five boreholes (locations shown in Figure 7.4) which allowed for the equilibrium groundwater level to be recorded. The groundwater levels recorded by Ground Investigations Ireland Ltd.(2015) are provided in Table 7-5 and Figure 7-4:

Based on the measured groundwater levels, groundwater flow direction is inferred to be to the east towards Dublin Bay which is consistent with the flow for the Dublin GWB. As noted in the site investigation report given the proximity of the Site to the coast groundwater levels would be expected to vary with the time of year, tidal influence, rainfall and other factors and while longer term data was not provided in the report, these potential variations in groundwater level are considered in this assessment (refer to Section 7.5).

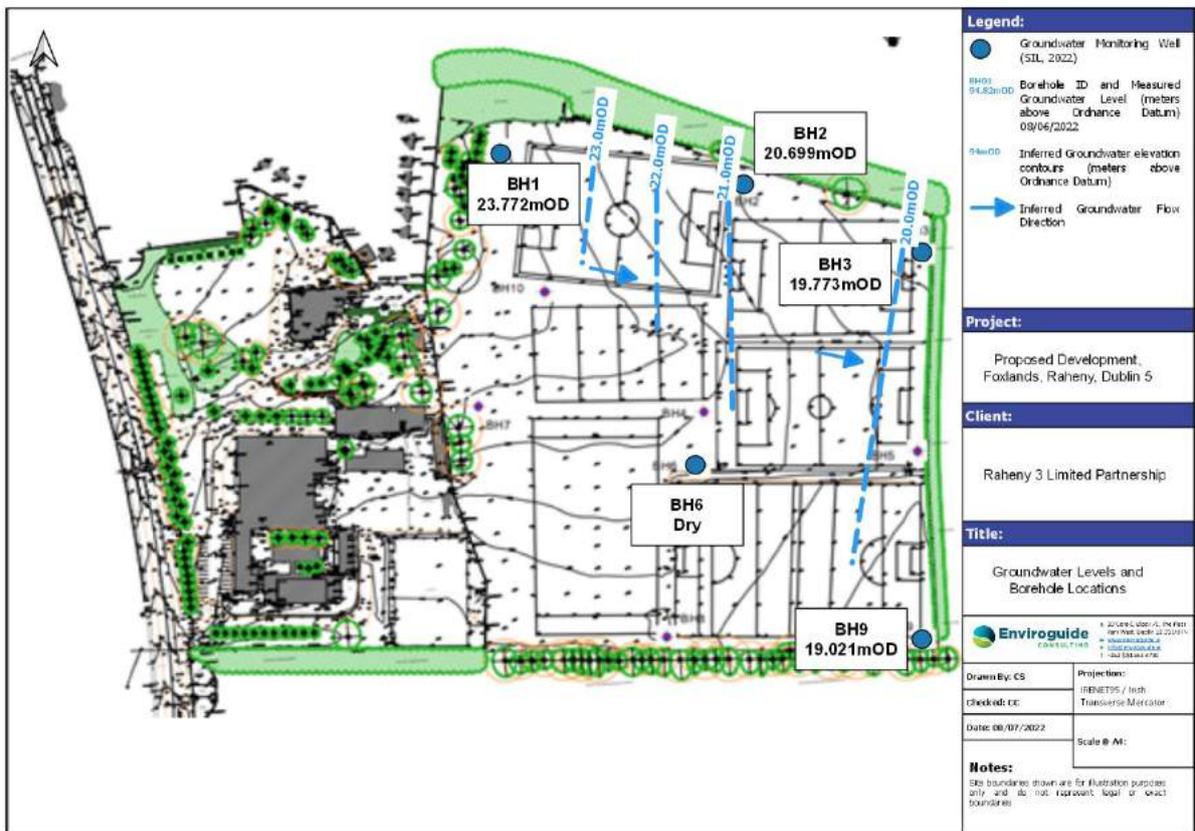


Figure 7-4 Groundwater Levels and Inferred Flow Direction (GIL, 2015)

Table 7-5 Groundwater Levels Measured Onsite (GIL, 2015)

Monitoring Location ID	Groundwater Strike During Drilling	Groundwater Level (mbGL)	Groundwater Level (mOD)
BH1	5.60	1.08	23.772
BH2	-	1.79	20.699
BH3	8.0	2.17	19.773
BH6	-	Dry	-
BH9	-	2.4	19.021

7.3.7 Hydrology

The Site is located within the Liffey and Dublin Bay Catchment (Catchment ID 09) and the Mayne SC_010 sub-catchment (Sub-Catchment ID 09_17).

The closest surface water course to the Site is the Naniken Stream (IE_EA_09S011100, Segment Code: 09_1469 and Waterbody name: Santry_020) adjoins the northern boundary of the Site and flows east and discharges to the Tolka Estuary transitional waterbody (IE_EA_090_0200) at James Larkin Road approximately 500m south of the Bull Island Causeway Road.

The Santry River is located 0.7km north of the Site (IE_EA_09S011100, Segment Code 09_2174 and Waterbody name: Santry_020) which flows east and discharges to the North Bull Island transitional waterbody (IE_EA_090_0100) immediately north of the Bull Island Causeway Road.

The Tolka River (IE_EA_09T011150) discharges to the Tolka Estuary transitional water body 4.4km west of the Site and the Toka Estuary is located 1.1km south of the Site. The Liffey Estuary Lower transitional waterbody (IE_EA_090_0100) is located approximately 3km south of the Site.

The surface water courses and relevant other water bodies within 2km of the Site described in Table 7-9 and presented in Figure 7-6.

7.3.8 Site Drainage

The site is currently greenfield and falls within the catchment of the Naniken Stream, located approximately 100m north of the site. Surface water currently infiltrates the ground, and any excess surface water flows overland and discharges onto the adjacent roads and ultimately to the existing public drainage network.

The existing foul network is comprised of a 1,350mm diameter North Dublin Drainage Scheme Trunk Sewer that discharges in an easterly direction immediately south of the site. There are also existing sewers in the Meadows development at the north-west of the site which connects to an existing 225mm sewer in Howth Road. There is no foul water sewer in Sybil Hill Road at the site entrance.

7.3.9 Flooding

A Site-Specific Flood Risk Assessment Report (SSFRA) has been produced for the Proposed Development Site (Waterman Moylan, 2022a).

The SSFRA concludes that the likelihood of tidal flooding is “extremely low” and no mitigation is required. Similarly, there is no mitigation required for fluvial flooding as the likelihood of its occurrence is also identified as “extremely low”.

The SSFRA identifies a likelihood of flood “ranging from low to high” for pluvial (private and public drainage networks). Mitigation measures outlined to address the potential risk of pluvial flooding include implementing appropriate drainage design, SuDS and attenuation design, setting appropriate floor levels and overland flood routing.

The likelihood of groundwater flooding is identified as “low” and an overall residual risk is identified as “low” if appropriate mitigation measures are put in place including setting appropriate floor levels, flood routing and damp proofing membranes.

The SSFRA concludes that “As a result of the proposed mitigation measures, the residual risk of flooding from any source is low” (Waterman-Moylan, 2021).

7.3.10 Water quality

7.3.10.1 Surface Water Quality

The data for the EPA surface water quality monitoring stations was consulted and relevant data pertaining to the Site was reviewed. The closest surface watercourse to the Site is the Naniken Stream and there are a number of monitoring stations on that water course. The closest EPA monitoring stations relevant to the Site are shown in Table 7-6 Surface Water Quality Monitoring Stations.

Table 7-6 Surface Water Quality Monitoring Stations

Station Name and Code	Distance from Site	River/Stream
Naniken Stream- St Anne's Park monitoring station (Station Code RS09N040100)	1.32km Downstream	Naniken Stream
Bettyglen monitoring station (Station Code RS09S011100)	1.48km Downstream	Santry River
Santry – Br on Main St Raheny station (Station Code RS09S011000)	1km Upstream	Santry River
Santry – Howth Rd Br Raheny monitoring station (Station Code Rs09S010900)	1km Upstream	Santry River

A river Q-value status “Bad” was assigned for the Bettyglen monitoring station in 1998 (EPA, 2022). There is no monitoring data available for the Naniken Stream.

Water quality data is available for an EPA monitoring station at Bettyglen. Water quality is reported as inert status for water quality with reported overall downward trend in the reported analytical results for Total Oxidised Nitrogen as N and Ammonia-Total as N while an upwards trend was seen for Ortho-phosphate as P for the period of 2013-2018 (EPA, 2022).

Table 7-7 Surface Water Quality Results for SW1

Parameter	Units	SW1 07/03/2019	SW1 04/04/2019	SW1 14/05/2019	SW1 27/06/2019
Ammonia as N	mg/l	0.25 6	0.28 8	1.27 0	0.10 2
CBOD5	mg/l O2	3	< 2	2	4
Cadmium	ug/l	< 0.2	< 0.2	0.3	< 0.2
Chlorine, Free	mg/l	< 0.01 0	< 0.01 0	0.02 0	< 0.01 0
Chloride	mg/l	42.7 44	34.0 99	36.4 78	32.0 97
Chromium	ug/l	1.2	< 0.9	1.1	< 0.9
Chromium VI	mg/l	< 0.02 0	< 0.02 0	< 0.02 0	< 0.02 0
Chromium III	mg/l	< 0.02 0	< 0.02 0	< 0.02 0	< 0.02 0
COD	mg/l O2	9	8	11	28
Conductivity @ 20°C	uS/cm @20 °C	600. 0	495. 0	526. 0	575. 0
Copper	ug/l	3.1	7.2	3.8	< 2.0
Fluoride	mg/l	0.3	0.4	0.4	0.5
Hardness as CaCO3	mg/l	341. 135	230. 386	249. 329	291. 779
Lead	ug/l	2.2	4.4	2.2	< 1.7
Nickel	ug/L	1.6	1.3	1.6	0.8
Arsenic – Total	ug/L	0.9	< 1.0	< 9.00 00	< 1.0
Total Cyanide Low	ug/L	< 10.0 000	< 0.70 00	< 1.0	< 0.70 00
Orthophosphate as P	mg/l	0.11 5	0.14 6	0.09 6	< 0.02 5
PH	pH Unit	7.84	7.91	7.64	8.11
Total Suspended Solids	mg/l	< 2	< 2	2	2
Zinc	ug/l	10.2	15.2	13.1	6.6

Table 7-8: Surface Water Quality Results for SW2

Parameter	Units	SW2 07/03/2019	SW2 04/04/2019	SW2 14/05/2019	SW2 27/06/2019
Ammonia as N	mg/l	0.163	0.144	0.618	0.083
CBOD5	mg/l O2	2	< 2	< 2	< 2
Cadmium	ug/l	< 0.2	< 0.2	0.4	0.3
Chlorine, Free	mg/l	< 0.010	< 0.010	< 0.010	< 0.010
Chloride	mg/l	48.961	35.624	35.882	30.953
Chromium	ug/l	1.1	< 0.9	< 0.9	< 0.9
Chromium VI	mg/l	< 0.020	< 0.020	< 0.020	< 0.020
Chromium III	mg/l	< 0.020	< 0.020	< 0.020	< 0.020
COD	mg/l O2	10	10	10	26
Conductivity @ 20°C	uS/cm @ 20°C	620.0	506.0	632.0	570.0
Copper	ug/l	5.6	3.4	3.5	< 2.0
Fluoride	mg/l	0.3	0.4	0.4	0.4
Hardness as CaCO3	mg/l	349.416	230.136	247.782	289.799
Lead	ug/l	2.1	4.6	2.7	< 1.7
Nickel	ug/L	1.1	1.8	< 0.5	1.1
Arsenic – Total	ug/L	1.0	1.1	1.2	< 1.0
Total Cyanide Low	ug/L	< 10.0000	< 0.7000	< 9.0000	< 0.7000
Orthophosphate as P	mg/l	0.048	0.075	0.066	0.068
PH	pH Unit	7.95	8.14	7.65	8.11
Total Suspended Solids	mg/l	< 2	< 2	< 2	< 2
Zinc	ug/l	11.6	11.5	8.5	5.6

Surface water sampling was carried out by Enviroguide Consulting on the Naniken stream on four separate occasions; 07 March 2019, 04 April 2019, 14 May 2019 and 27 June 2019 and is considered representative of baseline conditions at the Site. The laboratory results for SW1 are set out in Table 7-7 and the results for SW2 are set out in Table 7-8. The laboratory reports are included in Appendix J.

Surface water results were compared to the Environmental Quality Standards (EQS) values set out in S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 as amended.

The laboratory results indicated that Ammonia as N ranged between 0.102 and 1.270 mg/l as N which is in excess of the EQS for both upstream and downstream samples. Reported concentrations of Orthophosphate as P ranged between <0.02 and 0.146mg/l with higher concentrations at the upstream (SW1) location and exceedances of the EQS of 0.035mg/l as P (for Good Status).

All other analysed parameters were within the EQS limits.

7.3.10.2 Groundwater Quality

The EPA groundwater monitoring data was reviewed and there are no groundwater quality monitoring stations within 2km of the Site (EPA, 2022) however the EPA has assigned a 'Good' status to the groundwater within the Dublin GWB (refer to Section 7.3.12).

7.3.11 Water Use and Drinking Water Source Protection

There are no surface water features delineated as drinking water rivers or lakes in accordance with European Communities (Drinking Water) (No. 2) Regulations 2007 (SI no. 278/2007) within 2km of the Site. The bedrock aquifer of the Dublin GWB is delineated as a drinking water source.

There are two recorded groundwater sources within a 2km radius of the Proposed Development site (GSI, 2022) located 2.5km northwest of the Site at Coolock identified as being for "industrial use" with unknown groundwater yield. The locations of these wells are shown in Figure 7-5.

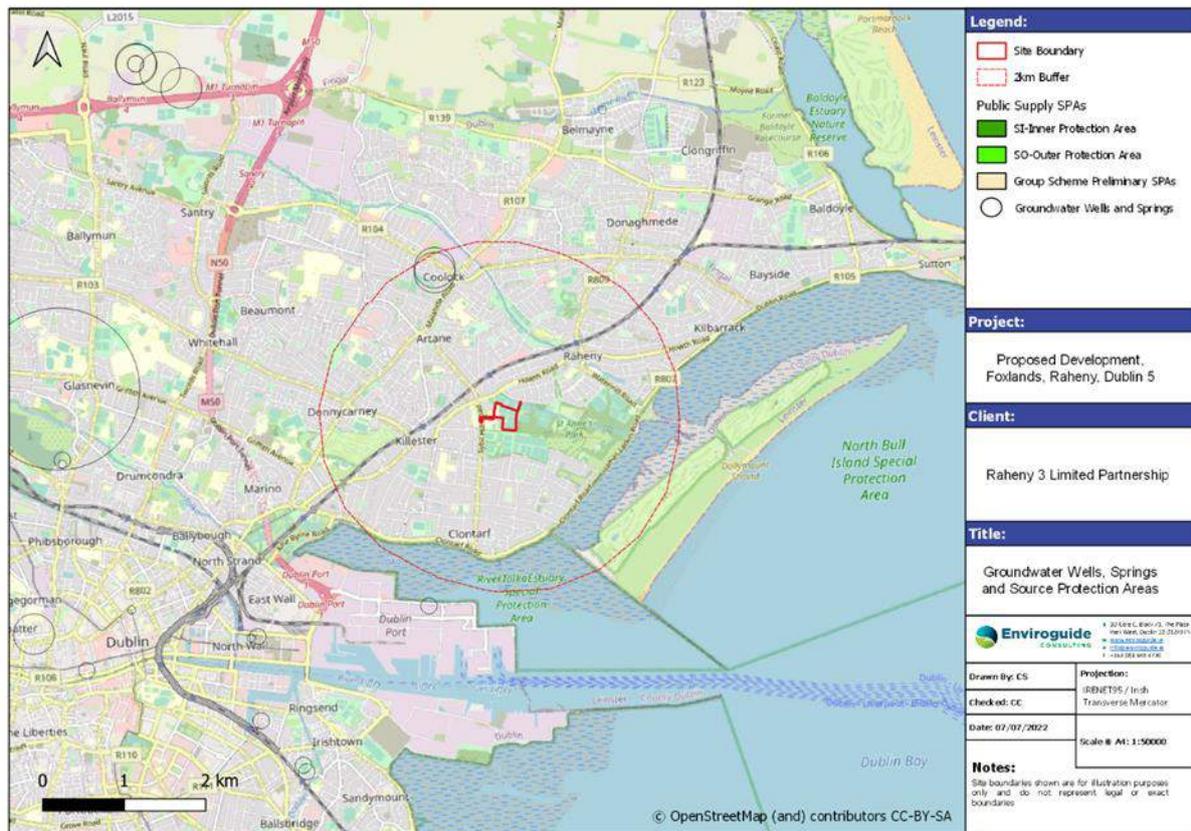


Figure 7-5 Groundwater Sources

7.3.12 Water Framework Directive Status

The Waterbody Status for river, groundwater and coastal water bodies located within a 2km radius of the Proposed Development Site and any water bodies considered to be hydraulically connected to the Site as recorded by the EPA (2022) in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003) are provided in Table 7 9 and shown in Figure 7-6. There are no identified unassigned water bodies within the study area of 2km or hydraulically connected to the Site.

Table 7-9: WFD Risk and Water body Status

Waterbody Name	Water body; EU code	Location from Site	Distance from Site (km)	WFD water body status (for the period of 2013-2018)	WFD 3 rd cycle Risk Status	Hydraulic Connection to the Site
Surface Water Bodies						
Naniken Stream	IE_EA_09S01 1100	East	0.24	Moderate	At Risk	Adjoining the Site
Santry River	IE_EA_09S01 1100	North	1.2	Moderate	At Risk	Cross-gradient of the Site.
Coastal Water Bodies						
Dublin Bay	IE_EA_090_0 000	East	N/A	Good	Not at Risk	Potential distal connection.
Groundwater Bodies						
Dublin Groundwater Body	IE_EA_G_008	N/A	N/A	Good	Review	Underlying groundwater-body
Transitional Water Bodies						
Tolka Estuary	IE_EA_090_0 200	East	1.1	Moderate	At Risk	Downgradient and downstream of Site.
North Bull Island	IE_EA_090_0 100	East/ Northeast	1.5	Moderate	Review	Potential distal connection

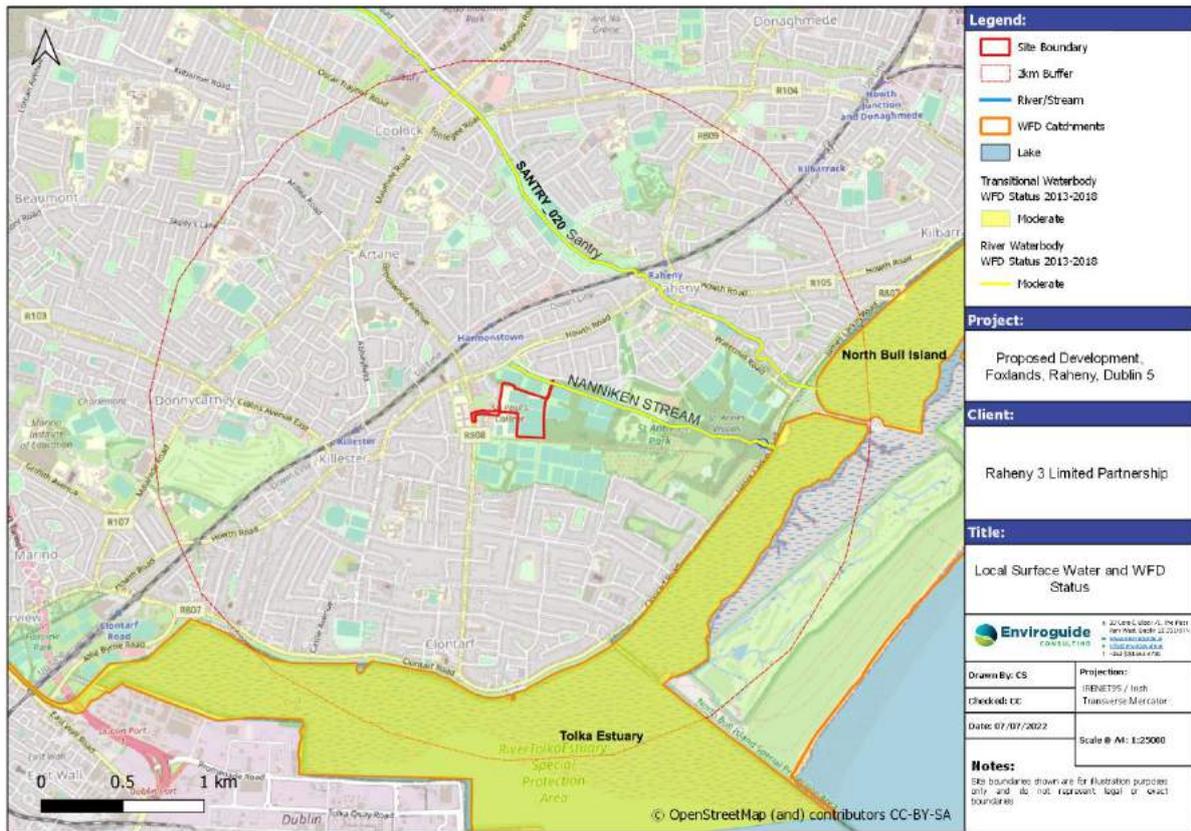


Figure 7-6 Groundwater and Surface Water bodies and WFD Status

7.3.13 Designated Sites

There are a number of designated sites (Natura 2000 sites- Special Areas of Conservation (SAC) and Special Protection Areas (SPA)) and other protected sites including Natural Heritage Areas (NHA) within a 15km radius of influence of the Site and details of these are provided in Chapter 5 (Biodiversity) of this EIAR the Natura Impact Statement (Enviroguide Consulting, 2022) prepared for the Proposed Development and the locations of these sites are shown in Figure 7-7.

The closest designated and protected sites with and those with a potential hydraulic connection to the Proposed Development Site are summarised in Table 7-10.

Table 7-10 Designated and Protected Sites with Hydraulic Connection to the Site

Site Name & Code	Direction from Site	Distance to Site	Hydraulic Connection to Site
Special Areas of Conservation			
Howth Head SAC (000202)	East	6.03km	Connection via groundwater/surface water/coastal water.

Site Name & Code	Direction from Site	Distance to Site	Hydraulic Connection to Site
Rockabill to Dalkey Island SAC (003000)	East	6.59km	Connection via groundwater/surface water/coastal water.
Ireland's Eye SAC (002193)	Northeast	8.8km	Connection via groundwater/surface water/coastal water.
North Dublin Bay SAC (000206)	East	2.6km	Connection via groundwater/surface water/coastal water.
Special Protection Areas			
Howth Head Coast SPA (004113)	East	9.4km	Connection via groundwater/surface water/coastal water.
Ireland's Eye SPA (004117)	East	1.75km	Connection via groundwater/surface water/coastal water.
North Bull Island SPA (004006)	East	1.75km	Connection via groundwater/surface water/coastal water.
North Dublin Bay SPA (004006)	East	1.2km	Connection via groundwater/surface water/coastal water.
Natural Heritage Areas (NHAs)			
<i>There are no NHAs within 15km of the proposed development</i>			
Proposed Natural Heritage Areas (pNHAs)			
Howth Head (000202)	Northeast	5.69km	Connection via groundwater/surface water/coastal water.
Ireland's Eye (000203)	Northeast	8.64km	Connection via groundwater/surface water/coastal water.
North Dublin Bay (000206)	South	1.56km	Connection via groundwater/surface water/coastal water..

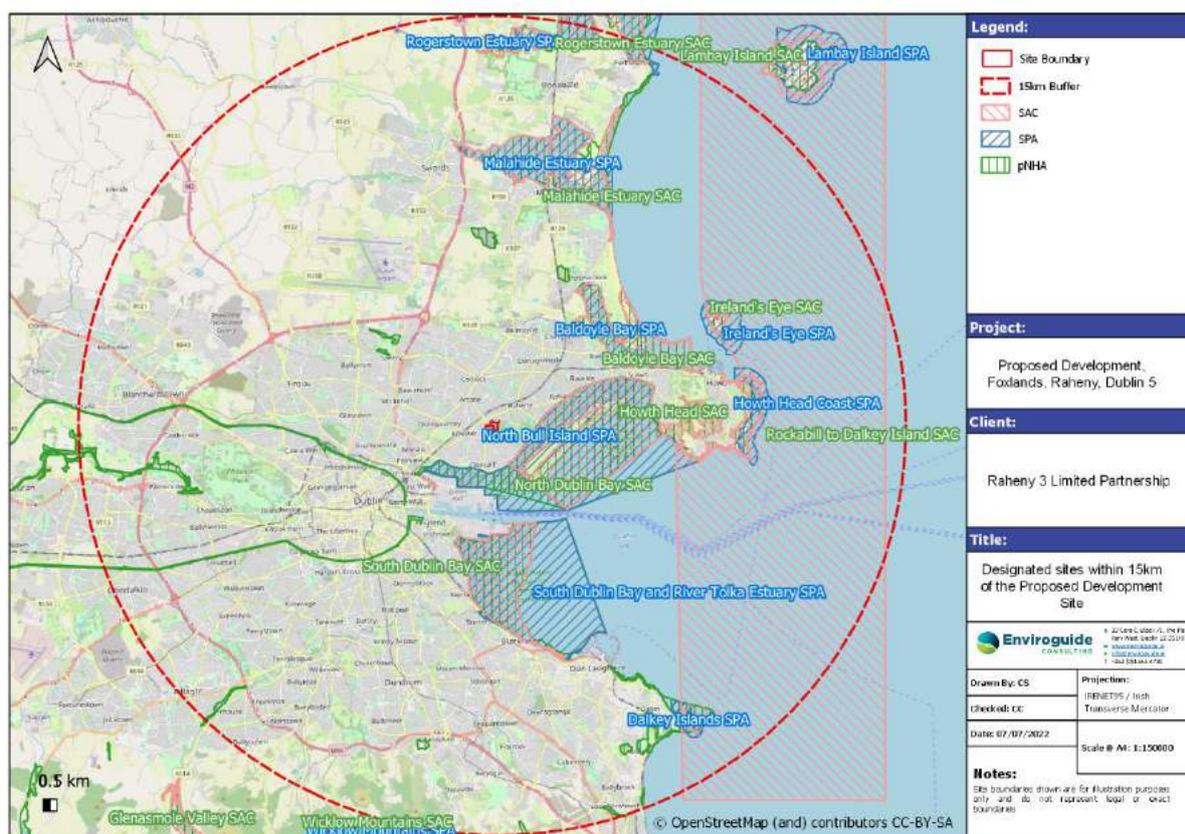


Figure 7-7 European Sites within 15km of the Proposed Development Site

7.3.14 Importance of the Receiving Environment

Surface water at the Site currently either infiltrates the ground or migrates offsite as overland flows. As outlined in Section 7.3.6 groundwater flow direction beneath the Site is to the east discharging to the Irish Sea.

In accordance with the criteria outlined in Table 7-1 and taking account of the hydrogeological setting of the Site, the attributes are considered to be of Low to Moderate importance based on the classification of the bedrock aquifers beneath the Site as Locally Important and Moderate. It is also noted that the GSI vulnerability rating for the Site is Low.

The receiving water bodies have been assigned a WFD Status of 'good' for groundwater, and 'good' for coastal water however, the surface water bodies in the vicinity of the Site are 'Moderate'.

7.4 Characteristics of the Proposed Development

7.4.1 General Description

The Proposed Development will consist of the construction of a residential and nursing home development set out in 7 No. Blocks, ranging in height from 4-7 storeys to accommodate 580 No. apartments, residential tenant amenity spaces, a creche and a 100-bed nursing home. The site will accommodate car parking spaces, bicycle parking spaces, storage, services and plant areas at both basement and podium level with vehicular and pedestrian access from Sybil Hill Road, via a proposed new access road. Landscaping will include extensive

communal amenity areas, and a significant public open space provision. This is set out as follows:

- The 7 no. residential buildings include 6 no. apartment blocks and 1 no. mixed-use block ranging in height from 4-7 storeys to accommodate 580 no. apartments, residential tenant amenity spaces, a creche and a 100-bed nursing home. The breakdown of residential accommodation is as follows:
 - Block A accommodates 61 no. apartments comprising of 31 no. 1 bed units, 25 no. 2 bed units and 5 no. 3 bed units;
 - Block B accommodates 70 no. apartments comprising of 44 no. 1 bed units and 26 no. 2 bed units;
 - Block C accommodates 112 no. apartments comprising of 46 no. 1 bed units, 57 no. 2 bed units and 9 no. 3 bed units;
 - Block D accommodates 136 no. apartments comprising of 56 no. 1 bed units, 58 no. 2 bed units and 22 no. 3 bed units;
 - Block E accommodates 96 no. apartments comprising of 47 no. 1 bed units, 46 no. 2 bed units and 3 no. 3 bed units;
 - Block F accommodates 36 no. apartments comprising of 23 no. 1 bed units, 9 no. 2 bed units and 4 no. 3 bed units;
 - Block G (Mixed-Use) accommodates 69 no. apartments comprising of 25 no. 1 bed units, 27 no. 2 bed units and 17 no. 3 bed units. It also accommodates a nursing home with 100 no. bed spaces and a creche with 6 no. classrooms.
- The Proposed Development will include three single basements under Block C, D and G. Basements in Block D and G will be used for car parking while the basement under Block C will be used as a plant room.
- The Proposed Development will accommodate 520 no. car parking spaces and 1,574 no. cycle spaces (both residential and visitor).
- The residential amenity space will include a gym, concierge, lounge and workspace, games room, screen room, flexibly spaces and building management.
- 31.15% of the site area will be allocated as public open space.
- All blocks will be provided with a bin store except Blocks D and C which will have compactors.

7.4.2 Construction Phase

The Construction Proposed Development will require:

- Demolition waste from the existing prefabricated/modular buildings.
- Bulk excavation to reduce levels to construct the basements beneath Block C, D and G and the surface water drainage including an attenuation tank. The proposed invert levels and floor levels of the basements are summarised in Table 7-11.
- Construction of foul and storm water drainage and mains water connection.
- It is proposed to drain wastewater from the site by gravity to the existing 1,350mm wastewater sewer at the south-eastern corner of the site.

- In-stream works will be carried out with the construction of a pre-cast headwall for the surface water outfall to the Naniken Stream.

Table 7-11 Groundwater Monitoring Levels and Underground Structure Depth

Drainage or Structure Name	Invert Level/ Finished Floor Level (mOD)	Groundwater Level (mOD)
Storm Water Attenuation Tank	20.16	Dry
Basement Block C	19.825	20.699
Basement Block D	19.825	Dry
Basement Block G	19.30	19.021

7.4.3 Operational Phase

The following is extracted from the Engineering Assessment Report (Waterman Moylan, 2022).

Foul water from the Proposed Development will have capacity within the existing foul sewer network which has been confirmed by Irish Water in the Confirmation of Feasibility letter dated 9 December 2021. The Confirmation of Feasibility letter states that Irish Water has no objection to the proposals. The request for a Statement of Design Acceptance was submitted to Irish Water on 30th June 2022 and is currently pending (Refer to Appendix A and Appendix B of the Engineering Assessment Report; Waterman Moylan, 2022). Foul water from the Proposed Development will ultimately be treated at Ringsend WwTP and discharged to Dublin Bay. All below ground foul sewers will be constructed in accordance with current Irish Water requirements and all drains will be laid in compliance with current Building Regulations and the recommendations contained in the Technical Guidance Document H.

Internal drainage within the basement areas will generally drain by gravity via slung drainage to be strapped to the underside of the ground floor slab within a dedicated service zone and by gravity below ground to its outfall location in all other areas. The basements will not generate any foul water, and no pumping is proposed.

It is proposed to discharge surface water from the Site to the Naniken Stream. Discharge will be restricted to the greenfield equivalent runoff rate via a Hydrobrake or similar approved flow control device. The surface water network will be designed to accommodate the 1-in-5 year storm, with attenuation storage provided for the 1-in-100 year storm. Excess runoff will be attenuated in an underground storage tank located between Blocks D and F, south of Block E.

Surface water will pass through a Class 1 by-pass petrol interceptor prior to discharge to the Naniken (Waterman Moylan, 2022 Drg. No. P200).

A Storm Water Management Plan will be incorporated through the use of numerous SuDS techniques to treat and minimise surface water runoff from the site. The methodology used to develop a Storm Water Management Plan is based recommendations set out in the Greater Dublin Strategic Drainage Study (GSDSDS) and in the SuDS Manual (CIRIA C753). The

following attenuation and SUDS measures will be incorporated into the Proposed Development as detailed in the Engineering Assessment Report (Waterman Moylan, 2022):

- Permeable paving
- Filter drains throughout Site
- Extensive green roofs on the buildings
- Tree pits located throughout the Site
- Underground attenuation tank
- Flow control device (Hydrobrake or similar) and
- Class 1 Bypass petrol interceptor located prior to outfall to Naniken Stream

7.5 Potential Impact of the Proposed Development

7.5.1 Construction Phase

Hydrogeological Flow Regime

Surface water currently discharges from the Site to the adjoining Naniken Stream and infiltrates through the unpaved surfaces. The Site is predominantly unpaved and there will be excavated and stripped soil during the construction phase however there will overall be an increase in hardstand areas (buildings, paved surfaces) introduced to the site during the post construction (Operational Phase) of the Proposed Development with 40% of the Site paved (Waterman Moylan, 2022). This could impact on the recharge potential at the Site but this will be only a localised area of the aquifer. Taking account of the urban setting of the Site, the limited potential for recharge into bedrock aquifer (which has a recharge coefficient of 7.5% of effective rainfall (GSI, 2022)) and the fact that 60% of the Site will remain unpaved with there will be no overall impact on groundwater recharge to the bedrock aquifer within the Dublin GWB associated with the Proposed Development.

Based on the available data, there will be no requirement for large-scale dewatering of groundwater across the entire Site. There will be a requirement for localised dewatering during the construction of basements and other subsurface structures, in particular basement at Block C. However taking account of the potential variations in groundwater levels (refer to Section 7.3.6, Table 7-5 and Table 7-11) there is potential that groundwater may be locally encountered during deeper excavations required to construct the basements at Block D and Block G. Management of surface runoff and localised perched groundwater will be required in particular during wet weather.

There will be no abstraction of surface water or groundwater for use on site during works (i.e., dust suppression, welfare facilities, drinking water). Water supply will be from mains supply in accordance with a connection agreement from Irish Water and therefore there will be no associated impact on local water resources at the Site

Overall, it is considered that any impact on the hydrogeological regime of the locally important aquifer is unavoidable and there will be a 'negative', 'imperceptible', 'temporary' ('long-term' during the Operational Phase) within a very localised zone of the aquifer only and there will be no impact on the flow regime of receiving surface water bodies.

Water Quality

The potential sources of contamination that could impact on water quality associated with the Construction Phase include:

- Demolition of existing pre-fabricated structures and groundworks including bulk excavation of soil and sediment will be necessary for construction of the basements and other subsurface infrastructure including drainage. The handling, stockpiling, reprofiling and removal offsite of soils could result in generation of excessive suspended solids in surface water runoff.
- Instream and near stream works will be required to construct the surface water outfall to the Naniken Stream that could result in release of cementitious materials, suspended sediments or other contaminant to the water course.
- Storage and use of fuel, oils and chemicals used during construction that are classified as hazardous. If the accidental release of hazardous material including fuels, chemicals and materials being used on-site, through the failure of secondary containment or a materials handling accident, were to occur over open ground then these materials could infiltrate to the underlying groundwater or migrate via surface water runoff to offsite water courses.
- Imported materials including fill materials that are not of the appropriate quality could result in leaching or runoff of contaminants to the water environment.
- Export of waste materials from the Site to unauthorised facilities could result in an impact on water quality at the receiving / destination site.
- Discharges or leaks from temporary welfare facilities could introduce contaminants to the water environment.
- Wheel washing discharges that could be contaminated with hydrocarbons, brake dust, metals, road salt, cleaning agents and other traffic residue.
- Leaks and spills of substances during storage, transport, use and/or disposal. The introduction of drilling fluids through piling (foundation type to be confirmed).
- Construction of foundations including where piled foundations required could introduce a preferential pathway to groundwater for surface contaminants on Site where groundwater may be exposed or result in the release of contamination from drilling fluids or other construction materials (e.g. cementitious materials) to the subsurface.
- Release of wash water from the wheel-wash could result in localised introduction of contaminants including hydrocarbons and suspended solids to the receiving water environment.

The key pathways and pollutant linkages are:

- Infiltration of surface contaminants to ground and groundwater and offsite migration to:
 - Groundwater
 - Surface water (Naniken Stream)
 - Transitional / Coastal water (Tolka Estuary and associated coastal water bodies within Dublin Bay)
- Surface water runoff to
 - Surface Water (Naniken Stream)

- Transitional / Coastal water (Tolka Estuary and associated coastal water bodies within Dublin Bay via the Naniken Stream)

The potential risk to the receiving water is considered in the absence of standard and appropriate construction management and mitigation measures that will be in place.

The release of suspended solids entrained in surface runoff directly from the Site or from haul routes to/from Site could enter the receiving water could potentially result in a 'negative', 'significant' 'short-term' impact on receiving water quality within the Naniken Stream and receiving water in Tolka Estuary.

There is a potential risk associated with the cementitious materials or other hazardous compounds used during construction works including piling, basements and attenuation tank construction, foul water drainage, surface water discharge drainage, permeable pavements and other structures impacting on the underlying groundwater at the Site which may result in a 'negative', 'significant' and 'medium-term' impact on the receiving water environment at the Proposed Development.

In-stream works will be required for the installation of the outfall to the Naniken Stream. Where possible, the design for these structures includes the use of pre-cast concrete thereby reducing the risk of any direct impact to water quality. Wet concrete works will be avoided however there may be a requirement for concrete pours and the use of cementitious materials during the installation of the outfall and therefore a potential risk to the receiving water quality. The use of plant and equipment near or in the stream could result in release of suspended sediment or drips and leaks of hydrocarbons (fuel and lubricants) to the water course. Overall, the use of cementitious material at the Proposed Development Site may result in a 'negative', 'significant' and 'long-term' impact on the receiving water of the Naniken Stream and downstream water bodies at the Tolka Estuary.

There is a potential risk for the mobilisation or introduction of contaminants (i.e., grout, drilling fluids) during piling works whereby a preferential conduit for contaminants to migrate downwards to groundwater could be introduced with potential for migration off-site. It is considered that there could be a 'negative', 'moderate' and 'medium term' impact on the existing groundwater quality and receiving surface water.

All surplus materials and waste will require removal offsite. Waste management for the Construction Phase is set out in the Construction and Demolition Waste Management Plan (CDWMP) (Waterman Moylan, 2022) and assessed in Chapter 12 Material Assets of this EIAR. However, in the unlikely event that surplus soil or other waste materials are directed to an unauthorised location there is potential for a 'negative', 'moderate' and 'medium-term' impact on the water quality at any receiving unauthorised locations.

In the event of a worst-case scenario such as a fuel spill or release of other hazardous compounds occurring it is considered that this could result in a 'negative', 'significant', 'long-term' impact on the quality of the receiving water course depending on the nature of the incident.

7.5.2 Operational Phase

Hydrogeological Flow Regime

The potential impacts on groundwater flow regime associated with the Proposed Development including the increased hardstand cover, the basements and other subsurface structures are

the same for the Construction Phase and Operational Phases and have been assessed and detailed in Section 7.5.

There will be an unavoidable 'negative', 'imperceptible', 'long-term' within a very localised zone of the aquifer only and there will be no impact on the flow regime of receiving surface water or other water bodies.

Drainage and Flood Risk

Both internal and external flooding have been assessed in the Flood Risk Assessment prepared for the Proposed Development prepared by Waterman Moylan (2022). The Flood Risk Assessment has been carried out in accordance with the DEHLG/OPW Guidelines on the Planning Process and Flood Risk Management published in November 2009. The assessment identifies the risk of both internal and external flooding at the site from various sources and sets out mitigation measures against the potential risks of flooding. The sources of possible flooding assessed in the report include coastal, fluvial, pluvial (direct heavy rain), groundwater and human/mechanical errors.

As a result of the flood risk management and mitigation measures proposed and taking account of climate change, the residual risk of internal or external flooding for the 30-year and 100-year flood events is low (Waterman Moylan, 2022).

The basements may intersect the groundwater table and therefore the potential for ingress of groundwater to the basement could occur if appropriate design measures are not implemented. This is accounted for in the SSFRA and the overall risk was assessed to be low.

Accordingly taking account of the findings of the Flood Risk Assessment the potential impact of flooding associated with the Proposed Development result in an overall 'neutral', 'imperceptible' 'long-term' on the Proposed Development and elsewhere.

Water Quality

There will be no risk to water quality including groundwater and surface water associated with the Operational Phase of the Proposed Development. It is considered that the design of the Proposed Development is in line with the objectives of the Water Framework Directive (2000/60/EC) to prevent or limit any potential impact on water quality. There will be no adverse impacts on the WFD status of the waterbodies in the vicinity of the Site listed out in Section 7.3.12.

There will be no significant sources of contamination at the Site during the operational phases taking account of the following embedded design considerations:

- There will be no bulk storage of petroleum hydrocarbon-based fuels used during the Operational Phase, thereby removing any potential contaminant sources associated with fuels.
- There will be no discharges to ground from drainage and only rainfall on public open spaces and landscape areas will infiltrate to ground.
- All surface water drainage from paved areas along roads and impermeable roads will be collected and managed within the surface water drainage and SuDS solutions as outlined in the Engineering Report (Waterman Moylan, 2022).

The key pathways and pollutant linkages are:

- Infiltration of surface contaminants to ground and groundwater and offsite migration to:
 - Groundwater aquifer and offsite
 - Surface water (Naniken Stream)
 - Coastal water (Dublin Bay)
- Surface water runoff to road gullies and sewers and migration to:
 - Bull Island Lagoon via surface water outfall into the Naniken Stream
- Foul water discharge to mains sewer and discharge via Ringsend WwTP to Dublin Bay.

The potential risk to the receiving water is considered in the absence of standard and appropriate construction management and mitigation measures.

The surface water management strategy includes a number of measures that will capture any potentially contaminating compounds (petroleum hydrocarbons, metals, and suspended sediments) in surface water runoff from roads and the impermeable areas that could potentially otherwise discharge to groundwater or the water courses within the Site and adjoining.

The measures incorporated in the SuDS design include filter drains around the perimeter of each block, green roofs, storage pond, permeable paving, by-pass interceptors and filter drains within the drainage and SuDS system. The filter drains will be effective in treating and removal of any contaminants (metals, polycyclic aromatic hydrocarbons (PAHs) and suspended solids) entrained in surface water runoff, the effectiveness of these SuDS measures is documented in TII guidance (TII, 2014) and the SuDS Manual (C753). The Proposed Development also includes Class 1 by-pass petrol interceptor prior to discharge to the Naniken Stream via a new headwall, which will be effective in removal of hydrocarbons that may enter the drainage system in particular in the event of worst-case scenario spill incident (e.g. collision on the roadway resulting in the loss of fuel from a vehicle). A non-return valve will be included before the new headwall at the surface water outfall to avoid any reversed flow.

Accordingly, any potential impact on receiving surface water and groundwater beneath the Proposed Development Site will be avoided taking into account the design proposals. Therefore, it is considered that the water quality protection criteria and objectives of the GDSDS and Water Framework Directive will be achieved.

As specified in the Engineering Assessment Report (Waterman Moylan, 2022) all below ground foul sewers will be constructed in accordance with current Irish Water requirements and Building Regulations. Therefore, any potential contaminant sources associated with drainage including foul sewers will be eliminated.

Overall, the foul and surface water drainage incorporating the SuDS proposals for the Proposed Development will result in an overall 'neutral', 'imperceptible' 'long-term' impact on receiving surface water quality and groundwater quality and associated receptors compared to the baseline conditions.

7.5.3 Potential Cumulative Impacts

7.5.3.1 Existing Planning Permissions

There are several existing planning permissions on record in the area surrounding the Proposed Development Site. They range from small-scale extensions and alterations to existing residential properties to some larger-scale developments. Developments considered for in-combination effects identified within the vicinity of the Proposed Development are as follows:

Planning Application Reference: 2857/18

Amendments to the permitted development (Reg. Ref. 4242/15; ABP Ref. PL29N.246250 and as amended by Reg. Ref. 2977/17, ABP Ref. PL29N.249043) at this 0.53 hectares site at Sybil Hill Road, Raheny Dublin 5. The site is bounded by St. Paul's School to the south, Sybil Hill Road to the west, The Meadows residential development to the east and north and the Kare Social Services Centre to the north. The site formerly incorporated No. 1, 1A and 1B Sybil Hill Road (and lands to the rear of same).

Planning Application Reference: 3167/19

Planning permission for development approved under Dublin City Council Reg. Ref. 4353/16 at the existing petrol filling station consisting of revisions to existing shop and forecourt including: (i) Change of use and internal alterations to ground floor to provide additional retail floorspace of 8 sq.m and ancillary facility for sales of hot food for consumption off the premises, (ii) New ground floor window and pay hatch to front elevation, (iii) Revisions to car parking layout, and (iv) all associated site, drainage and boundary development works. (Decision: Grant Permission. Decision Date: 09/09/2019).

Planning Application Reference: 2998/20

The development will consist of the following: construction of (i) a pergola structure consisting of a timber frame with retractable awning system above; (ii) sand and cement rendered block walls (0.8 m in height) with precast concrete capping to surround the proposed pergola structure; (iii) raised planted bedding along the block walls; and (iv) all site works necessary to facilitate the development. The proposed structure is located within the internal courtyard area at St. Paul's College. (Decision: Grant Permission. Decision Date: 19/10/2020).

Planning Application Reference: 3803/21

Permission for development at this site, which contains a Protected Structure known as Manresa House. The proposed development will consist of: 1) a new single storey, flat-roofed building located to the northeast of the protected structure, to provide for new reception, dining, cooking and associated ancillary spaces, with rooflights, solar panels and part sedum roof; 2) a new single-storey, flat-roofed open loggia structure forming a covered route from the existing Retreat Building to the proposed new building; 3) associated hard landscaping, including new terrace and external steps, 2no. disabled parking bays, and extensive planting works to the courtyard; 4) landscaping works, including the provision of 36 no. car-parking spaces, new planting to the west lawn and the formation of a new stormwater attenuation pond; and 5) the removal of an existing single-storey, pitched roof timber structure. (Decision: Grant Permission. Decision Date: 17/02/2022).

Potential Impacts

Capacity within the existing foul sewer network has been confirmed by Irish Water (Waterman Moylan, 2022). The foul water from the Proposed Development will ultimately be treated at Ringsend WwTP which operates under existing statutory consents. Furthermore, Irish Water have completed the first phase of upgrade works to Ringsend WwTP in December 2021, which increased the capacity of the facility by 400,000 P.E. These works, together with the further works will ultimately increase the capacity of the facility from 1.6 million PE to 2.4 million PE. This plant upgrade will result in an overall reduction in the final effluent discharge loading to the receiving waters.

As Irish Water have confirmed that there is capacity within the foul network (refer to Irish Water, 2022 Certificate of Feasibility as Appendix A in Waterman Moylan, 2022b) to accept foul water from the Proposed Development, there are no anticipated cumulative impacts on the receiving water environment associated with the Proposed Development due to discharges from Ringsend WwTP.

The Proposed Development will be connected to the existing mains water supply subject to agreement from Irish Water who issued a Confirmation of Feasibility for the connection on 1st October 2019 (reference number CDS19006864 – included as Appendix A of the Engineering Assessment; Report Waterman Moylan, 2022). The mains water supply is operated in accordance with relevant existing statutory consents therefore there will be no cumulative impacts associated with the Proposed Development on water resources.

The transport of material to and from the Site if not appropriately managed could result in sediment and debris being tracked offsite on trucks and other site vehicles from the Proposed Development and other development sites in the area. There is a possibility of impact for water courses at offsite locations in the immediate vicinity of the Site due to sediment that may be entrained in road runoff (i.e. Naniken Stream, Santry River, Tolka Estuary and North Bull Island).

There are no other identified cumulative impact on groundwater and surface water resources associated with the Proposed Development taking account of the existing hydrogeological and hydrological setting of the Site and design particulars of the Proposed Development.

7.5.4 “Do Nothing” Impact

In the ‘Do Nothing’ scenario it is considered that the Proposed Development did not proceed and the potential impact on the receiving hydrological and hydrogeological environment is considered.

In the “Do Nothing” scenario the site would not be developed there would be no altering of groundwater / surface water regime by drainage, increasing hard standing area and basement construction.

If the Proposed Development did not proceed the Proposed Development Site would remain as a greenfield Site and there would be no change to the hydrological and hydrogeological regime at the Proposed Development Site.

In the ‘Do Nothing’ scenario the housing supply requirements may be satisfied with a new residential development in another location.

7.6 Avoidance, Remedial & Mitigation Measures

These avoidance, remedial and mitigation measures, will ensure that there will be no significant impact on the receiving groundwater and surface water environment. Hence, the Proposed Development will not have any impact on compliance with the EU Water Framework Directive, European Communities (Environmental Objectives) Surface Water Regulations, 2009 (SI 272 of 2009, as amended 2012 (SI No 327 of 2012), and the European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010), as amended 2012 (SI 149 of 2012) and 2016 (S.I. No. 366 of 2016).

7.6.1 Construction Phase

A Construction Environmental Management Plan (CEMP) and Construction and Demolition Waste Management Plan (CDWMP) will be implemented by the contractor to ensure, site-specific procedures and mitigation measures to monitor and control environmental impacts throughout the Construction Phase of the project and ensure that construction activities do not adversely impact the environment. The CEMP and CDWMP will take cognisance of the measures outlined in the EIAR and the Preliminary CDWMP (Waterman Moylan, 2022) and CEMP (Enviroguide Consulting, 2022) submitted under separate cover with the planning application for the Proposed Development.

The construction works will be managed with consideration of applicable regulations and standard international best practice including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors;
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005;
- BPGCS005, Oil Storage Guidelines;
- EPA (2004) IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities;
- CIRIA 697, The SUDS Manual, 2007;
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004;
- Construction Industry Research and Information Association CIRIA C648: Control of water pollution from linear construction projects: Technical guidance (Murnane et al. 2006);
- CIRIA C648: Control of water pollution from linear construction projects: Site guide (Murnane et al. 2006); and
- Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters

7.6.1.1 Control and Management of Water

There will be no discharges to groundwater or surface water during the Construction Phase. Water runoff to adjoining roads will not be permitted.

There will be localised groundwater dewatering during the construction of the basement and management of water will include control of surface water runoff and pumping of water from excavations.

Where necessary the water will be treated onsite to remove sediment or other potentially contaminating compounds. The treated water will be tankered offsite or discharged to sewer only under licence from Irish Water as appropriate.

During earthworks there is the potential for suspended solids entrained in runoff to enter the gullies on the adjoining roads.

Silt fences will be appropriately located around earthworks areas as appropriate to manage runoff. The contractor is to ensure that no contaminated water/liquids leave the Proposed Development Site (as surface water and surface water run-off or otherwise), enter the local drainage system or direct discharge drainage ditches or water courses or springs in particular the Naniken Stream.

The quality of the discharge of water from excavations will be regularly monitored visually for a hydrocarbon sheen and suspended solids, as well as periodic laboratory testing.

Any erosion control measures (i.e. silt-traps, silt-fencing and swales) will be regularly maintained during the Construction Phase. Any required silt fences or silt-traps must not be placed within 10m of any open water course or drainage ditch.

The flows of water into excavations are anticipated to be small and will be managed by sump pumping, which will be managed in accordance with best practice standards (CIRIA – C750) and regulatory consents.

7.6.1.2 In-stream Works and Protection of Water Courses

All open water courses adjacent to the site (namely the Naniken Stream) will be protected by a 10m constraint zone around the water course to avoid suspended sediment or other potential contaminants being released into the water course. Site vehicles will only be permitted within this 10m buffer to facilitate instream works to enable construction of the outfall to the Naniken Stream. Crossings of the Naniken Stream will not be required and will not be permitted except in an emergency scenario if required.

All instream works or works carried out at the Naniken Stream will follow the guidelines published by Inland Fisheries Ireland (IFI) 'Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters' (IFI, 2016) and The National Roads Authority (2018) (now Transport Infrastructure Ireland) 'Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes' and other current best-practice standards at the time of construction.

Where instream works are required for the construction of outfalls, the following must be implemented in addition to other measures outlined in Section 7.6:

- Instream machine works will be avoided and if required any machines working in the watercourse must be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels.
- Instream earthworks must be executed so as to minimise the suspension of solids.
- Any over-pumping or temporary diversion of water required must include appropriate treatment of water before return to the water course

- Every care must be taken to insure against spillage of concrete or leakage of cement grout within cofferdams.

A suitably qualified Ecological Clerk of Works will be present on-site during the works being undertaken along the Naniken Stream in particular the construction of the surface water out-fall.

Monitoring of all water protection measures and infrastructure (e.g., silt-traps, silt-fences and other operational controls) will be undertaken to ensure effective operation for the duration of the Construction Phase. Any damaged or defective infrastructure will be replaced immediately (within the same working day).

7.6.1.3 Control and Management of Soil and Bedrock

Prior to excavation, a detailed review of the final cut and fill model will be carried out to confirm cut and fill volumes. As the site is largely undeveloped contaminated soil is not expected to be encountered. Soil analytical data included in the Site Investigation Report (Appendix I) indicates the general absence of contamination associated with anthropogenic sources at the Site with the exception of localised areas of low-level petroleum hydrocarbon in the northwest corner and northeast corner of the Site respectively. These trace concentrations are not considered to pose an environmental or human health risk. These soils and any yet unidentified contaminated soils or other contaminated materials encountered during the works, will be managed in accordance with relevant guidelines including EPA 'Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites' (EPA, 2013) and guidance and standards current at the time of construction works. Potentially contaminated soil will be excavated and removed and disposed of off-site in accordance with the Waste Management Acts, 1996 as amended, and associated regulations and guidance.

Any surplus soil not suitable for re-use as a by-product and other waste materials arising from the Construction Phase will be removed offsite by an authorised contractor and sent to the appropriately authorised (licensed/permitted) receiving waste facilities.

7.6.1.4 Management of Stockpiles

Stockpiled soil and stone materials pending removal offsite or reuse onsite will be located in designated areas only and there will be no storage of materials within 10m of any boundary, drains and watercourses. Where necessary, stockpiles will be surrounded with silt fencing to filter out any suspended solids from surface water arising from these materials (refer to Section 7.6.1.1).

While waste classification and acceptance at a waste facility is pending, excavated soil for recovery/disposal will be stockpiled as follows:

- A suitable temporary storage area will be identified and designated;
- All stockpiles will be assigned a stockpile number;
- Soil waste categories will be individually segregated; and all segregation, storage & stockpiling locations will be clearly delineated on the Site drawings;
- Erroneous pieces of concrete will be screened from the stockpiled soils and segregated separately;

- Non-hazardous and hazardous soil (if required to be stockpiled) will be stockpiled only on hard-standing or high-grade polythene sheeting to prevent cross-contamination of the soil below; and
- Soil stockpiles will be sealed to prevent run-off of rainwater and leaching of potential contaminants from the stockpiled material generation and/or the generation of dust.

Waste will be stored on-site, including concrete, asphalt and soil stockpiles, in such a manner as to:

- Prevent environmental pollution (bunded and/or covered storage, minimise noise generation and implement dust/odour control measures, as may be required);
- Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling and recovery; and
- Prevent hazards to site workers and the general public during construction phase (largely noise, vibration and dust).

7.6.1.5 Concrete Works

The use of cementitious grout used during the construction of the basement and other infrastructure will avoid any contamination of the ground through the use of appropriate design and methods implemented by the Contractor and in accordance with industry standards.

All ready-mixed concrete will be delivered to the Proposed Development Site by truck. Concrete mixer trucks will not be permitted to wash out onsite with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite.

There will be a requirement for in-stream and near stream works for the construction of the outfall to the Naniken Stream. Pre-cast structures will be used where technically feasible in accordance with the drainage design specification. Avoidance and mitigation measures for the in-stream works are detailed in Section 7.6.1.2.

7.6.1.6 Piling Methodology

The piling methodology to be implemented by the Contractor will minimise the potential for the introduction of any temporary conduit between any potential sources of contamination at the ground surface and underlying groundwater. The piling method will include procedures to ensure any potential impact to water quality is prevented including preventing surface runoff or other piling/drilling fluids from entering the pile bores and surrounding formation. Where there is a requirement to use lubricants, drilling fluids or additives the contractor will use water-based, biodegradable and non-hazardous compounds under controlled conditions.

7.6.1.7 Importation of Soil and Aggregates

Contract and procurement procedures will ensure that all aggregates and fill material required are sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity and compliance standards and statutory obligations. The storage of imported materials will be located at least 10m away from any surface water features and surrounded with silt fencing to filter out suspended solids.

The importation of aggregates will be subject to management and control procedures which will include testing and assessment of the suitability for use in accordance with engineering

and environmental specifications for the Proposed Development including the suitability of material that may be imported in accordance with a By-Product Notification under Article 27 of the European Communities (Waste Directive) Regulations 2011. Therefore, any unsuitable material will be identified, avoided and not imported to the Site.

7.6.1.8 Handling of Fuels and Hazardous Materials:

Fuel, oils and chemicals used during construction are classified as hazardous.

- Storage of fuel and hazardous materials will be undertaken with a view to protecting any essential services (electricity, water etc.) and the receiving land, soil and geology environment.
- Bulk quantities of fuel will not be stored at the Site.

There will be appropriate storage areas for any fuel, oils and chemicals. Storage will be within a clearly marked bund on an impervious base remote from any surface water features such as oil. Temporary oil interceptors will be installed for period of the construction phase. Fuel will only be stored in the quantities required for emergency use and re-fuelling. All drums to be quality approved and manufactured to a recognised standard. If drums are to be moved around the Site, they will be secured and moved on spill pallets. Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

- Bunds will have regard to Environmental Protection Agency guidelines 'Storage and Transfer of Materials for Scheduled Activities' (EPA, 2004) and Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines. All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:
 - 110% of the capacity of the largest tank or drum within the bunded area; or
 - 25% of the total volume of substance that could be stored within the bunded area.
- Only emergency maintenance will be carried out on site;
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Site and compliantly disposed of off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with current industry best practice procedures and EPA guidelines;
- Site staff will be familiar with emergency procedures in the event of accidental fuel spillages; and
- All staff on-site will be fully trained on the use of equipment to be used on-site.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at designated refuelling station locations onsite and will be from a road tanker brought to site as required. Each station will be fully contained and equipped for spill response and a specially

trained and dedicated Environmental and Emergency Spill Response team will be appointed by the contractor before the commencement of works onsite.

7.6.1.9 Welfare Facilities

Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. All waste from welfare facilities will be managed in accordance with the relevant statutory obligations through either a temporary connection to mains foul sewer (subject to receipt of the relevant consent from Irish Water) which will be constructed in accordance with Irish Water guidelines or by tankering of waste offsite by an appropriately authorised contractor in compliance with all legislative requirements.

7.6.1.10 Wheel-Wash and Water Treatment Facilities

The use of wheel-wash and water treatment facilities and infrastructures will be used where necessary including where outlined in Sections 7.6.1.1 through to 7.6.1.9. The correct use and management of these will be undertaken by the appointed contractor to ensure that there is no harm or impact to the receiving water environment.

To prevent tracking of dust and debris on haul routes offsite the following will be undertaken:

- Implement a wheel washing system where necessary.
- Use of dedicated internal haul routes and set down areas that will be covered with hardcore or similar.

To prevent fugitive runoff from the Site the following will be implemented:

- Silt traps, silt fences and tailing ponds will need to be provided by the contractor where necessary to prevent silts and soils being washed away by heavy rains during the course of the construction stage.
- Surface water runoff and water pumped from the excavation works will be discharged via a silt trap / settlement pond to the existing foul drainage network.
- Onsite water treatment system will be used if required to remove suspended solids and hydrocarbons.

All sludges and other waste from wheel-wash and water treatment infrastructure including silt fences will be removed from the Site by the contractor in accordance with all legislative requirements.

7.6.1.11 Decommissioning of Boreholes

Any site investigation and monitoring boreholes remaining at the Site that are no longer required will be decommissioned in accordance with the specifications outlined in EPA Advice Noted 14 (EPA, 2013) and current best-practice at the time of decommissioning. This will remove any potential direct conduit for contaminants to enter the groundwater directly and potentially migrate offsite.

7.6.2 Operational Phase

The Proposed Development design incorporates SuDS measures that will avoid and mitigate any potential impact on water quality. With regard to the proposed discharge of treated operational surface water from the Proposed Development to the Naniken Stream, the

potential for surface water generated at the Site of the Proposed Development to cause significant effects to downstream sensitivities during the Operational Phase would be considered negligible due in part to the SUDS measures incorporated in the Project Design. Project specific SUDS measures are listed below: Green roofs;

- Filter drains;
- Permeable paving;
- Tree pits;
- Rain gardens;
- Detention basin;
- Underground attenuation and flow control; and
- Petrol interceptor

Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures in accordance with CIRIA SuDS Manual C753 will be incorporated into the overall management strategy for the Proposed Development. There is no other requirement for mitigation measures for the Operational Phase of the Proposed Development.

7.6.3 “Worst Case” Scenario

During the Construction Phase there is a potential risk of accidental release of petroleum hydrocarbons (e.g., a fuel spill) that could migrate to groundwater or surface water would result in a ‘negative’, ‘significant’, ‘long-term’ impact on the quality of the receiving water depending on the nature of the incident in the absence of design avoidance and mitigation measures outlined in Section 7.6.1 and 7.6.2 and emergency response procedures as detailed in Section 13.3.1 and the CEMP (Enviroguide Consulting, 2022).

During the Operational Phase of the Proposed Development, surface water runoff including runoff of deleterious material (i.e., fuels from vehicles on-site) will be directed to the mains sewer via appropriate treatment (Class 1 by-pass interceptor) and not to groundwater or directly to surface water. In a ‘Worst Case’ scenario and in the absence of mitigation including SuDS measures, there is a potential risk of accidental release of untreated water via failure or rupture of the drainage system with potential impacts on the receiving water environment. It is considered that the potential risk of the release of untreated water will present a ‘negative’, ‘significant’ and ‘long-term’ impact on the receiving environment.

However, taking account of the avoidance and mitigation measures the worst-case scenarios are deemed to be an unlikely scenario.

7.6.4 Human Health

No public health issues have been identified for the Construction Phase or Operational Phase of the Proposed Development.

Appropriate industry standard and health and safety legislative requirements will be implemented during the Construction Phase that will be protective of site workers in particular associated with the instream works.

The water supply for the Proposed Development will be via connection to the public supply.

There are no identified groundwater sources in the vicinity of the Site, however, in the event of unidentified groundwater users (i.e., drinking water supply well) taking account of the design of the proposed development and the avoidance and mitigation measures there will be no potential risk to any drinking water sources associated with the Proposed Development.

7.6.5 Water Framework Directive

There are identified potential impacts to water quality associated with the Proposed Development for the Construction Phase and Operational phase in the absence of embedded design avoidance measures and mitigation measures that could impact on the Water Framework Directive Status of receiving water bodies.

The fact WFD status of 'Moderate' (Naniken Stream surface water and Tolka Estuary transitional water bodies) and a status of 'Good' (Dublin GWB Dublin Bay coastal water body) has been assigned the closest receiving water body receptors was considered for this assessment. As the risk status of 'Review' assigned to the Dublin GWB it was assumed that the status of 'At Risk' of not achieving WFD objectives was assigned for the Dublin GWB to enable a worst-case scenario assessment.

Based on a worst-case scenario there would be a potential impact on the WFD status of the receiving water bodies, in particular those 'at risk' with a 'moderate' status. However, taking account of the proposed design incorporating avoidance and mitigation measures (discussed in Section 7.6) the Proposed Development will not result in deterioration or alteration of the WFD status for water bodies associated with the Proposed Development Site.

7.7 Residual Impacts

Residual Impacts are defined as 'effects that are predicted to remain after all assessments and mitigation measures. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts.

The predicted impacts of the Construction and Operational Phases are described in Section 7.5 and summarised in Table 7.7 in terms of quality, significance, extent, likelihood, and duration and the residual impacts which take account of the avoidance, remedial and mitigation measures.

There are no likely significant adverse residual impacts on hydrology and hydrogeology anticipated regarding this Proposed Development.

Table 7-12 Summary of Residual Impacts

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
Construction of basement and subsurface infrastructure and temporary dewatering.	Hydrogeological Flow Regime	Groundwater flow within the aquifer will not be impacted and dewatering will not be required	Negative	Imperceptible	Temporary	Direct	None	Imperceptible
Use of potentially hazardous materials cementitious materials.	Water Quality	Potential release of cementitious material during the construction of foundations, pavements, basement, pile walls and other structures.	Negative	Significant	Medium Term	Direct	The design will incorporate the use of pre-cast concrete structures where appropriate. The Contractor will carry out works in accordance with industry standards. Detailed design for piling to include methods to prevent impact water quality.	Imperceptible
Earthworks – release of suspended solids	Surface Water Quality	Potential for release of sediment to surface water	Negative	Significant	Short-term	Direct	Appropriate measures including silt fences and buffer zones to be used to prevent fugitive runoff including to	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
							Naniken Stream and adjoining roads	
Earthworks – removal of surplus material and waste	Water quality	Potential for release of sediment to surface water	Negative	Moderate	Medium-Term	In-direct	All surplus material and waste material will be removed offsite in accordance with detailed procedures in strict accordance with all waste management legislation and the procedures outlined in the CEMP	Imperceptible
In-stream Works at the Naniken Stream for construction of the outfall.	Water quality	Potential for release of sediment and other contaminants to surface water	Negative	Significant	Long Term	Direct	Appropriate measures including silt fences and buffer zones to be used to prevent fugitive runoff including to Naniken Stream. Pre-cast concrete to be used where feasible.	Imperceptible
Accidental release of deleterious materials including fuel and other materials being used on-site.	Groundwater / Surface Water	Potential (albeit low) for uncontrolled release of deleterious materials including fuels and other materials being used on-site, through the failure of secondary and tertiary containment or a materials handling accident.	Negative	Significant	Long Term	Direct / Worst Case	Procedures for the use and handling of all potentially hazardous compounds to be included in the CEMP to be prepared by the Contractor.	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
Piling Works	Introduce preferential pathway and impact on water quality	Potential for migration of contaminants during piling works via direct conduit to subsurface.	Negative	Moderate	Medium-Term	Direct	Detailed design piling and method to be prepared by the appointed contractor. Use of water-based, biodegradable non-hazardous substances to be used.	Imperceptible
Operational Phase								
Basement, and other infrastructure	Hydrogeological Flow Regime	Groundwater flow within the aquifer will not be impacted	Negative	Imperceptible	Long-term	Direct	None	Imperceptible
Surface Water Drainage and discharge to the Naniken Stream	Water Quality	Surface water drainage at the Proposed Development Site has been designed in accordance with SuDS and therefore it is anticipated that water quality will not be impacted	Neutral	Imperceptible	Long-term	Direct	SuDS incorporated in the design and therefore it is anticipated that water quality will not be impacted. Maintenance of SuDS will be required as part of the overall management strategy to be implemented.	Imperceptible
Surface Water Drainage	Flood Risk and surface water regime	The Site-Specific FRA identified that there is no risk of flood at the Site or elsewhere and the Proposed Development has been designed in accordance with the	Neutral	Imperceptible	Long-term	Direct	None required.	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
		principles of SuDS and satisfies the requirements of GSDS (Waterman Moylan, 2022a).						
Discharge to foul sewer	Mains Sewer and receiving water at Ringsend WwTP	Discharges to sewer will only be permitted where authorised by Irish Water. Confirmation of Feasibility received from Irish Water (Irish Water, 2021; Reference CDS21002487)	Neutral	Imperceptible	Permanent	Indirect / Cumulative	None Required.	Imperceptible

7.8 Monitoring

7.8.1 Construction Phase

During the construction phase the following monitoring measures will be implemented:

- Monitoring and sampling of groundwater and surface water will be undertaken during critical stages of the construction works in particular during construction of the outfall at the Naniken and during bulk excavation works where groundwater may be encountered.
- Inspections and monitoring will be undertaken during excavations, piling and other groundworks to ensure that measures protective of water quality are fully implemented and effective.
- Discharges to sewers will be monitored in accordance with statutory consents (discharge licence).
- Routine monitoring and inspections during refuelling, concrete works to ensure no impacts and compliance with ameliorative, remedial and reductive measures.
- Materials management and waste audits will be carried out at regular intervals

7.8.2 Operational Phase

Ongoing regular operational monitoring and maintenance of drainage and the SuDS will be carried out.

No other monitoring is required during the Operational Phase.

7.9 Interactions

7.9.1 Population and Human Health

No public health issues associated with the Proposed Development Site and the receiving water environment including drinking water sources have been identified.

Appropriate industry standards and health and safety legislative requirements will be implemented during the construction phase that will be protective of site workers.

It is noted that specific issues relating to Public Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.

7.9.2 Material Assets - Water

Any discharges to the public foul sewer and abstractions from water supply from the Proposed Development will be under consent from Irish Water. An assessment of the potential impact of the Proposed Development on the Material Assets including built services, infrastructure, traffic, and waste management has been set out in Chapter 12 of this EIAR.

7.9.3 Land, Soil, Geology and Hydrogeology

An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment during the Operational Phase of the Proposed Development is set out in Chapter 6 Land, Soil and Geology.

7.9.4 Biodiversity

The Proposed Development will potentially impact ecological receptors via surface water runoff to road gullies and sewers and groundwater migration.

An assessment of the potential impacts of the Proposed Development on the Biodiversity of the Proposed Development Site, with emphasis on habitats, flora and fauna which may be impacted as a result of the Proposed Development is included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.

7.9.5 Traffic

Any possibility of cumulative impacts on water courses at off-site locations in the immediate vicinity of the Site (i.e. The Naniken Stream and Tolka Estuary), due to sediment that may be entrained in road runoff due to Traffic activities and resulting tracked sediment and debris being tracked offsite during the Construction Phase of the Proposed Development are addressed in Section 7.5.3.2 in this Chapter. The Proposed Development will have no significant impact on overall traffic volumes at the Proposed Development Site during the Operational Phase and therefore traffic will not result in any significant impacts on water quality or quantity at sensitive water body receptors. Any specific issues relating to Traffic impacts associated with the Proposed Development are set out in Chapter 12 of this EIAR.

7.10 Difficulties Encountered When Compiling

There were no difficulties encountered when compiling the Hydrology and Hydrogeology Chapter of this EIAR.

7.11 References

- Construction Industry Research and Information Association, 2000. Environmental Handbook for Building and Civil Engineering Projects.
- Construction Industry Research and Information Association, 2001. Control of Water Pollution from Construction Sites (CIRIA – C532).
- Construction Industry Research and Information Association, 2011. Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors.
- Construction Industry Research and Information Association, 2005. Environmental Good Practice on Site (CIRIA – C650).
- Construction Industry Research and Information Association, 2007. The SuDS Manual (CIRIA – C697).
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy with amendments 2455/2001/EC, 2008/32/EC and 2008/105/EC.
- Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines.
- Environmental Protection Agency, August 2017. Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2017).
- Environmental Protection Agency, September 2015. Draft Advice Notes for preparing Environmental Impact Statements (EPA, 2015).
- Environmental Protection Agency, 2013. Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites.
- Environmental Protection Agency, 2004. IPC Guidance Note. Guidance Note on Storage and Transfer of Materials for Scheduled Activities.
- Environmental Protection Agency, 2022. Catchments webmapping <https://www.catchments.ie/maps/>. Consulted on 30/06/2022.
- Environmental Protection Agency, 2022. EPA HydroNet webmapping and databases. <http://www.epa.ie/hydronet/#Water%20Levels>. Consulted on 29/06/2022.
- Environmental Protection Agency, 2022. EPA Envision Maps. <https://gis.epa.ie/EPAMaps/>. Consulted on 01/07/2022.
- Enviroguide Consulting, 2022. Natura Impact Statement for Proposed Mixed Use Development at lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5.
- Dublin City Council Development Plan 2022-2028(Dublin City Council, 2012).
- Geological Society of Ireland, 2022. GSI webmapping. <https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228>. Consulted on 30/06/2022.
- Geological Survey of Ireland, 2022. Groundwater Body Reports, Dublin GWB. https://secure.dccae.gov.ie/GSI_DOWNLOAD/Groundwater/Reports/GWB/DublinGWB.pdf. Consulted on 30/06/2022.
- Google Earth Pro, 2022. Consulted on 30/06/2022.

Ground Investigations Ireland Ltd., 201. St. Paul's Raheny Ground Investigation Report (Project No. 5228-07-15)

Institute of Geologists of Ireland, 2013. Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.

Met Éireann, 2012. Séamus Walsh, 'Long-term climate averages for Ireland 1981 - 2010', [IE_RR_8110_V1] (Walsh, 2012).

National Parks and Wildlife Services (NPWS) webmapping 2022.
<https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=8f7060450de3485fa1c1085536d477ba>. Consulted on 28/06/2022.

National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

Ordnance Survey Ireland, 2022. Ordnance Survey Ireland webmapping
<http://map.geohive.ie/mapviewer.html>. Consulted on 29/06/2022.

Office of Public Works, 2022. OPW Flood Risk webmapping.
<https://www.floodinfo.ie/map/floodmaps/>. Consulted on 28/06/2022.

Water Framework Directive, 2022. Water Framework Directive web mapping -
http://watermaps.wfdireland.ie/NsShare_Web/. Consulted on 27/06/2022.

Waterman Moylan Engineering Consultants Ltd., 2021. Flood risk Assessment Proposed Mixed-Use Development at Foxlands, Raheny, Dublin 5 (document Reference: 21-083r.002 Flood risk Assessment).

Waterman Moylan Engineering Consultants Ltd., 2022. Engineering Assessment Report Proposed Mixed-Use Development at Foxlands, Raheny, Dublin 5); (Document Reference: 21-083r.001 Engineering Assessment Report).

Waterman Moylan Engineering Consultants Ltd., 2022. Construction, Demolition & Waste Management Plan Proposed Mixed-Use Development at Foxlands, Raheny, Dublin 5); (Document Reference: 21-083r.003 Construction, Demolition & Waste Management Plan).

8 AIR QUALITY AND CLIMATE

8.1 Introduction

This Chapter will describe and assess the potential impacts on air quality and climate associated with the Proposed Development at Sybil Hill Road, Raheny, Dublin 5. The Chapter was prepared by Aoife Grogan (BA Hons, MSc) and Laura Griffin (BA Hons, MSc), Environmental Consultants, Enviroguide Consulting, Aoife and Laura have experience working on a number of EIARs and EIA Screening Reports for projects of a similar scale to the Proposed Development.

Taking into account Ambient Air Quality Standards, the baseline air quality will be examined along with the potential for release of emissions to the atmosphere and associated effects prior to and following mitigation measures. This Chapter will also describe and assess the potential impacts on micro and macro-climate as a result of the Proposed Development. Attention will be focused on Ireland's obligations under the Kyoto Protocol in the context of the overall climatic impact of the presence and absence of the Proposed Development.

8.1.1 Ambient Air Quality Standards

For the protection of health and ecosystems, EU directives apply air quality standards in Ireland and other EU member states for a range of pollutants. These rules include requirements for monitoring, assessment and management of ambient air quality. The first major instrument in tackling air pollution was the Air Quality Framework Directive 96/62/EC and its four daughter Directives. Each of these instruments was repealed with the introduction of Directive 2008/50/EC on ambient air quality and cleaner air for Europe in 2008 (as amended by Decision 2011/850/EU and Directive 2015/1480/EC) (the CAFE Directive), save for the "Fourth Daughter Directive" (Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air).

The CAFE Directive lays down measures aimed at:

- 1) defining and establishing objectives for ambient air quality designed to avoid, prevent or reduce harmful effects on human health and the environment as a whole;
- 2) assessing the ambient air quality in Member States on the basis of common methods and criteria and, in particular, assessing concentrations in ambient air of certain pollutants;
- 3) providing information on ambient air quality in order to help combat pollution and nuisance and to monitor long-term trends and improvements resulting from national and Community measures;
- 4) ensuring that such information on ambient air quality is made available to the public;
- 5) maintaining air quality where it is good and improve it in other cases;
- 6) promoting increased cooperation between the Member States in reducing air pollution.

Ambient air quality monitoring and assessment in Ireland is carried out in accordance with the requirements of the CAFE Directive. The CAFE Directive has been transposed into Irish legislation by the Air Quality Standards Regulations (S.I. No. 180 of 2011). The CAFE Directive requires EU member states to designate 'Zones' reflective of population density for

the purpose of managing air quality. Four zones were defined in the Air Quality Standards Regulations (2011) and subsequently amended in 2013 to account for 2011 census population counts and to align with coal restricted areas in the Air Pollution Act (Marketing, Sale, Distribution and Burning of Specified Fuels) Regulations 2012. (S.I. No. 326 of 2012) (the 2012 Regulations).

The main areas defined in each zone are:

- ❖ **Zone A:** Dublin Conurbation
- ❖ **Zone B:** Cork Conurbation
- ❖ **Zone C:** Other cities and large towns comprising Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, Ennis, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise.
- ❖ **Zone D:** Rural Ireland, i.e., the remainder of the State excluding Zones A, B and C.

The Site of the Proposed Development is located on lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5 and falls under the 'Zone A' category based on the EPA CAFE Directive.

The CAFE Directive outlines certain limit or target values specified by the five published directives that apply limits to specific air pollutants. These limits, outlined in Table 8-1, will be referred to as part of the Proposed Development assessment with respect to air quality.

Table 8-1: Limit Values of Cleaner Air for Europe (CAFE) Directive 2008/50/EC (Source: EPA, 2020)

Pollutant	Limit Value Objective	Averaging Period	Limit Value $\mu\text{g}/\text{m}^3$	Limit Value ppb	Basis of Application of the Limit Value	Limit Value Attainment Date
SO ₂	Protection of Human Health	1 hour	350	132	Not to be exceeded more than 24 times in a calendar year	1 Jan 2005
SO ₂		24 hours	125	47	Not to be exceeded more than 3 times in a calendar year	1 Jan 2005
SO ₂	Protection of vegetation	Calendar year	20	7.5	Annual mean	19 July 2001
SO ₂		1 Oct to 31 Mar	20	7.5	Winter mean	19 July 2001
NO ₂	Protection of human health	1 hour	200	105	Not to be exceeded more than 18 times in a calendar year	1 Jan 2010
NO ₂		Calendar year	40	21	Annual mean	1 Jan 2010
NO + NO ₂	Protection of ecosystems	Calendar year	30	16	Annual mean	19 July 2001

Pollutant	Limit Value Objective	Averaging Period	Limit Value $\mu\text{g}/\text{m}^3$	Limit Value ppb	Basis of Application of the Limit Value	Limit Value Attainment Date
PM10	Protection of human health	24 hours	50	-	Not to be exceeded more than 35 times in a calendar year	1 Jan 2005
PM10		Calendar year	40	-	Annual mean	1 Jan 2005
PM2.5 - Stage 1		Calendar year	25	-	Annual mean	1 Jan 2015
PM2.5 - Stage 2		Calendar year	20	-	Annual mean	1 Jan 2020
Lead		Calendar year	0.5	-	Annual mean	1 Jan 2005
Carbon Monoxide		8 hours	10,000	8,620	Not to be exceeded	1 Jan 2005
Benzene		Calendar year	5	1.5	Annual mean	1 Jan 2010

The EPA is the competent authority for the purpose of the CAFE Directive and is required to send an annual report to the Minister for Environment and the European Commission. The regulations further provide for the distribution of public information. This includes information on any exceedances of target values, the reasons for exceedances, the area(s) in which they occurred, and the relevant information regarding effects on human health and environmental impacts.

8.1.2 Climate Agreements

Climate change is recognised as one of the most serious global environmental problems and arguably the greatest challenge facing humanity today. While natural variations in climate over time are normal, anthropogenic activities have interfered greatly with the global atmospheric system by emitting substantial amounts of greenhouse gases (GHGs). This has caused a discernible effect on our global climate system, with continued change expected due to current and predicted trends of GHG emissions. In Ireland this is demonstrated by rising sea levels, changes in the ecosystem, and extreme weather events.

In March 1994, the United Nations Framework Convention on Climate Change (UNFCCC) was established as an intergovernmental effort to tackle the challenges posed by climate change. The Convention membership is almost universal, with 197 countries having ratified. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices. This information is then utilised to launch national strategies and international agreements to address GHG emissions. Following the formation of the UNFCCC, two major international climate change agreements were adopted: The Kyoto Protocol, and the Paris Agreement.

In April 1994, Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) and subsequently signed the Kyoto Protocol in 1997. The Kyoto Protocol is an international agreement linked to the UNFCCC which commits its parties to legally binding emission reduction targets. In order to ensure compliance with the protocol, the Intergovernmental Panel on Climate Change (IPCC) has outlined detailed guidelines on compiling National Greenhouse Gas Inventories. These are designed to estimate and report on national inventories of anthropogenic GHG emissions and removals. Under Article 4 of the Kyoto Protocol, Ireland agreed to limit the net anthropogenic growth of the six named GHGs to 13% above the 1990 level, spanning the period 2008 to 2012.

The second commitment period of the Kyoto Protocol was established by the Doha amendment which was adopted *in extremis* on the 8th of December 2012, to impose quantified emission limitation and reduction commitments (QELRCs) to Annex I (developed country) Parties during a commitment period from 2013 to 2020. 38 developed countries, inclusive of the EU and its 28 member states, are participating. Under the Doha amendment, participating countries have committed to an 18% reduction in emissions from 1990 levels. The EU has committed to reducing emissions in this period to 20% below 1990 levels. Ireland's QELRCs for the period 2013 to 2020 is 80% of its base year emissions. Ireland's compliance with the Doha amendment will be assessed based on the GHG inventory submission in 2022 for 1990-2020 data. As of October 2020, the Doha Amendment has received the required number of ratifications to enter into force. Once in force, the emission reduction commitments of participating developed countries and economies in transition (EITs) become legally binding.

In December 2015, the Paris Climate Change Conference (COP21) took place and was an important milestone in terms of international climate change agreements. The Paris Agreement sets out a global action plan to put the world on track to mitigate dangerous climate change by setting a global warming limit not to exceed 2°C above pre-industrial levels, with efforts to limit this to 1.5°C. As a contribution to the objectives of the agreement, countries have submitted comprehensive national climate action plans (nationally determined contributions, NDCs). Under this agreement, governments agreed to come together every 5 years to assess the collective progress towards the long-term goals and inform Parties in updating and enhancing their nationally determined contributions. Ireland will contribute to the Agreement through the NDC tabled by the EU on behalf of Member States in 2020, which commits to a 55% reduction in EU-wide emissions by 2030 compared to 1990. This is considered to be the current NDC maintained by the EU and its Member States under Article 4 of the Paris Agreement.

The EU has set itself targets for reducing its GHG emissions progressively up to 2050, these are outlined in the 2020 climate and energy package and the 2030 climate and energy policy framework. These targets are defined to assist the EU in transitioning to a low-carbon economy, as detailed in the 2050 low carbon roadmap. The 2020 package is a set of binding legislation to ensure that the EU meets its climate and energy targets for the year 2020. There are three key targets outlined in the package which were set by the EU in 2007 and enacted in legislation in 2009:

- 20% reduction in GHG emissions from 1990 levels;
- 20% of EU energy to be from renewable sources;
- 20% improvement in energy efficiency.

The 2030 climate and energy framework builds on the 2020 climate energy package and was adopted by EU leaders in October 2014. The framework sets three key targets for the year 2030:

- At least 40% cuts in GHG emissions from 1990 levels;
- At least 32% share for renewable energy;
- At least 32.5% improvement in energy efficiency.

The EU has acted in several areas in order to meet these targets, including the introduction of the Emissions Trading System (ETS). The ETS is the key tool used by the EU in cutting GHG emissions from large-scale facilities in the power, industrial, and aviation sectors. Around 45% of the EU's GHG emissions are covered by the ETS.

As part of the European Green Deal, the Commission proposed in September 2020 to raise the 2030 greenhouse gas emission reduction target, including emissions and removals, to at least 55% compared to 1990. The European Climate Law came into force in July 2021 and writes into law the goal set out in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. The law also sets the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels.

8.1.2.1 National Policy Position in Ireland

National climate policy in Ireland recognises the threat of climate change to humanity and supports mobilisation of a comprehensive international response to climate change, and global transition to a low-carbon future.

The Climate Action and Low Carbon Development (Amendment) Act 2021 was enacted in 2021 and sets Ireland on a legally binding path to net-Zero emissions no later than 2050, and to a 51% reduction in emissions by the end of this decade. The Act provides the framework for Ireland to meet its international and EU climate commitments and to become a leader in addressing climate change.

The Irish Government recently published its Climate Action Plan (2021) which provides a detailed framework for taking decisive action to achieve a 51% reduction in overall greenhouse gas emissions by 2030 and setting Ireland on a path to reach net-zero emissions by no later than 2050, as committed to in the Programme for Government and as required by the Climate Act 2021. The Plan lists the actions needed to deliver on national climate targets and sets indicative ranges of emissions reductions for each sector of the economy. It will be updated annually, next in 2022, to ensure alignment with Ireland's legally binding economy-wide carbon budgets and sectoral ceilings.

Ireland's latest greenhouse gas (GHG) emissions 1990-2020 are provisional figures based on the SEAI's final energy balance released in September 2021 (EPA, 2021). In 2020, Ireland's GHG emissions are estimated to be 57.70 million tonnes carbon dioxide equivalent (Mt CO₂eq), which is 3.6% lower (or 2.14 Mt CO₂ eq) than emissions in 2019 (59.84 Mt CO₂ eq). There was a decrease of 4.0% in emissions reported for 2019 compared to 2018. Emissions reductions have been recorded in six of the last ten years of inventory data (2010-2020). In 2020, national total emissions decreased by 3.6%, emissions in the stationary ETS sector decreased by 6.4% and emissions under the ESD (Effort Sharing Decision) decreased by

2.7%. In 2020, the energy industries, transport and agriculture sectors accounted for 70.1% of total GHG emissions. Agriculture is the single largest contributor to the overall emissions, at 37.1%. Transport, energy industries and the residential sector are the next largest contributors, at 17.9%, 15.0% and 12.3%, respectively (EPA, 2021).

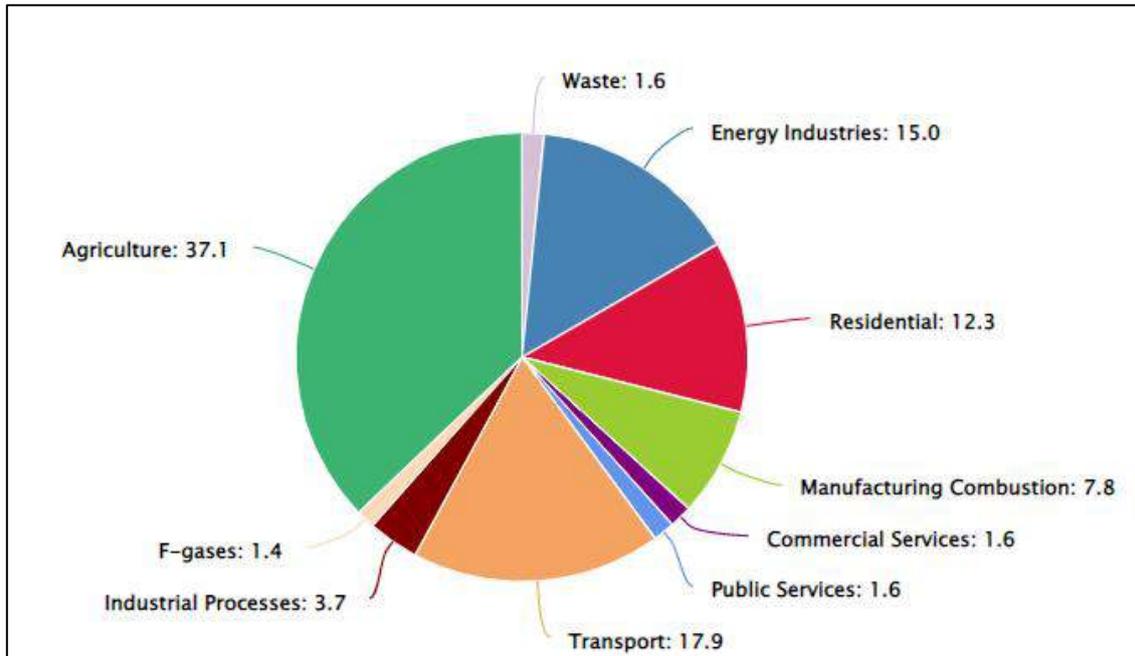


Figure 8-1: Ireland's Greenhouse Gas Emissions by Sector for 2020 (Source: EPA, 2021)

8.2 Study Methodology

Taking into account Ambient Air Quality Standards, the baseline air quality of the Site was examined using EPA monitoring data. Air quality impacts from the Proposed Development were then determined by a qualitative assessment of the nature and scale of dust generating activities associated with the construction phase of the project in accordance with relevant guidance (Transport Infrastructure Ireland (TII) 2011 Appendix 8; Institute of Air Quality Management (IAQM) 2014).

Operational Phase traffic impact assessment involved air dispersion modelling using the UK Design Manual for Roads and Bridges Screening Model (DMRB, UK Highways Agency 2007) (Version 1.03c), the NO_x to NO₂ Conversion Spreadsheet (UK Department for Environment, Food and Rural Affairs, 2017), and following all relevant guidance (TII, 2011; HA, 2007; EPA; UK DEFRA; IAQM).

A desktop study involving various national and international documents on climate change and analysis of synoptic meteorological data from the nearest Met Eireann station was also carried out in order to compile this chapter. Attention will be focused on Ireland's obligations under the Kyoto Protocol (including the Doha Amendment) and the Paris Agreement in the context of the overall climatic impact of the presence and absence of the Proposed Development.

8.3 The Existing and Receiving Environment (Baseline Situation)

The Site of the Proposed Development is located on lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5. The site is bound to the north, east and south by St Anne's Park and to the west by residential development at The Meadows, Sybil Hill House (a Protected Structure) and St Paul's College. Vehicular access to the site is from Sybil Hill Road. Raheny is a northern suburb of Dublin, midway between Dublin City Centre and Howth. It is administered by Dublin City Council.

8.3.1 Air Quality

According to the 2012 Regulations (S.I. No. 326 of 2012) the proposed Site falls into 'Zone A' of Ireland which is described by the EPA as 'Dublin Conurbation'. The assessment carried out for the purposes of this Chapter confirmed that existing ambient air quality in the vicinity of the Site is characteristic of a suburban location with the primary source of air emissions such as particulate matter, NO₂, and hydrocarbons being traffic and domestic fuel burning.

In conjunction with individual local authorities, the EPA undertakes ambient air quality monitoring at specific locations throughout the country in the urban and rural environment; an Air Quality Report based on data from 30 monitoring stations and a number of mobile air quality units is developed on an annual basis. The EPA's most recent publication 'Air Quality in Ireland, 2020' reports the quality of the air in Ireland based on the data from the National Ambient Air Quality Monitoring Network throughout the year 2020.

When assessing air quality, the EPA focuses on two main pollutants: particulate matter and nitrogen oxides. Measured concentrations of NO₂ for the years 2019 and 2020 are presented in Table 8-2 for Zone A monitoring stations. These results show that current levels of NO₂ are well below the annual mean and 1-hour maximum limit values. In the year 2019, annual mean concentrations of NO₂ ranged from 15 - 49 ug/m³ across all Zone A stations, with no exceedance of the maximum hourly limit (EPA, 2020). In the year 2020, annual mean concentrations of NO₂ ranged from 11 - 30 ug/m³ across all Zone A stations, with no exceedance of the maximum hourly limit (EPA, 2021).

The Dublin Port monitoring station is the closest station to the Site (ca. 2.5km) which continuously monitors for concentrations of nitrogen oxides (NO₂). Concentrations of NO₂ are also well below the threshold limits contained within the regulations at Dublin Port monitoring station, with an annual mean of 23 ug/m³ measured in 2020 (EPA, 2021). Despite its close proximity, it is not considered that NO₂ measurements taken at Dublin Port would accurately represent ambient air conditions at the subject Site due to the suburban location of the Proposed Development. The Dublin Port monitoring station is located in an urban area with high traffic, transport, and combustion emissions.

The closest suburban background monitoring station to the Site which continuously monitors for concentrations of nitrogen oxides (NO₂) is located in Swords (ca. 9km to the north). Concentrations of NO₂ are also well below the threshold limits contained within the regulations at Swords monitoring station, with an annual mean of 15 ug/m³ and 11 ug/m³ measured in 2019 and 2020, respectively (EPA, 2020; EPA, 2021).

During 2020, the restriction of movement in Ireland due to the COVID-19 Pandemic had an impact on air quality nationally with a large-scale reduction in vehicular traffic. It is noted that the decrease in NO₂ levels during that year is a direct result of the restrictions placed on movements and construction due to COVID-19.

Based on the EPA monitoring data and taking account of the Site's environs and surrounding land-use, along with changes in vehicular and construction activity, a conservative estimate of current background NO₂ concentrations in the vicinity of the Site is 18 ug/m³.

Table 8-2: Concentrations of NO₂ at Zone A Monitoring Stations

Station	Objective	Concentration (µg/m ³)		Limit or Threshold Value (ug/m ³)	Number of values >200µg/m ³
		2019	2020		
Winetavern St	Annual Mean NO ₂	28	15	40	N/A
	Hourly Max NO ₂	142	121.5	200	0
Davitt Road	Annual Mean NO ₂	24	14	40	N/A
	Hourly Max NO ₂	127	108.3	200	0
DAA	Annual Mean NO ₂	-	23	40	N/A
	Hourly Max NO ₂	-	88.8	200	0
St. Johns Road	Annual Mean NO ₂	43	30	40	N/A
	Hourly Max NO ₂	156	130.1	200	0
Rathmines	Annual Mean NO ₂	22	13	40	N/A
	Hourly Max NO ₂	183	170	200	0
Dun Laoghaire	Annual Mean NO ₂	15	14	40	N/A
	Hourly Max NO ₂	104	92.1	200	0
Ballyfermot	Annual Mean NO ₂	20	12	40	N/A
	Hourly Max NO ₂	124	107.7	200	0

Station	Objective	Concentration ($\mu\text{g}/\text{m}^3$)		Limit or Threshold Value ($\mu\text{g}/\text{m}^3$)	Number of values $>200\mu\text{g}/\text{m}^3$
		2019	2020		
Blanchardstown	Annual Mean NO_2	31	12	40	N/A
	Hourly Max NO_2	163	164.6	200	0
Swords	Annual Mean NO_2	15	11	40	N/A
	Hourly Max NO_2	108	83.7	200	0
Dublin Port	Annual Mean NO_2	-	23	40	N/A
	Hourly Max NO_2	-	117.3	200	0
Pearse St	Annual Mean NO_2	49	27	40	N/A
	Hourly Max NO_2	151	142.3	200	0
Tallaght	Annual Mean NO_2	-	14	40	N/A
	Hourly Max NO_2	-	100.8	200	0
Ringsend	Annual Mean NO_2	24	18	40	N/A
	Hourly Max NO_2	109	123.8	200	0

Measured concentrations of PM_{10} for the years 2019 and 2020 are presented in Table 8-3 for Zone A monitoring stations. As is evident from these results, current levels of PM_{10} are well below the annual mean limit value. In the year 2019, annual mean concentrations of PM_{10} ranged from 11 – 19 $\mu\text{g}/\text{m}^3$ across all Zone A stations, with no exceedance of short-term limit values (EPA, 2020). In the year 2020, annual mean concentrations of PM_{10} ranged from 10 – 20 $\mu\text{g}/\text{m}^3$ across all Zone A stations, with no exceedance of short-term limit values (EPA, 2021).

The suburban background monitoring site of St. Anne's Park is located less than 1km from the Site of the Proposed Development and therefore is highly representative of background concentrations in the vicinity of the Proposed Development. This station continuously monitors for concentrations of PM_{10} . Concentrations of PM_{10} at St. Annes Park monitoring station are well below their respective limit values in 2019 and 2020, with an annual mean of 12 $\mu\text{g}/\text{m}^3$

and 11 $\mu\text{g}/\text{m}^3$, respectively, and with no exceedances of the PM_{10} daily limit for the protection of human health (EPA, 2020; EPA, 2021).

Based on the EPA data, a conservative estimate of the current background PM_{10} concentration in the region of the Proposed Development is 12 $\mu\text{g}/\text{m}^3$.

Table 8-3: Concentrations of PM_{10} at Zone A Monitoring Stations

Station	Objective	Concentration ($\mu\text{g}/\text{m}^3$)		Limit or Threshold Value
		2019	2020	
Winetavern St	Annual Mean PM_{10}	15	13	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	9	0	35 days
Rathmines	Annual Mean PM_{10}	15	11	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	9	2	35 days
Phoenix Park	Annual Mean PM_{10}	11	10	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	2	0	35 days
Blanchardstown	Annual Mean PM_{10}	19	15	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	11	2	35 days
Dun Laoghaire	Annual Mean PM_{10}	12	12	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	2	0	35 days
Ballyfermot	Annual Mean PM_{10}	14	12	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	7	2	35 days
Tallaght	Annual Mean PM_{10}	12	10	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	3	0	35 days
Ringsend	Annual Mean PM_{10}	19	17	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	12	8	35 days
St. John's Road	Annual Mean PM_{10}	14	13	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	5	0	35 days
St Annes Park	Annual Mean PM_{10}	12	11	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	1	0	35 days
Dublin Airport	Annual Mean PM_{10}	-	13	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	-	0	35 days

Station	Objective	Concentration ($\mu\text{g}/\text{m}^3$)		Limit or Threshold Value
		2019	2020	
Davitt Road	Annual Mean PM_{10}	19	15	$40 \mu\text{g}/\text{m}^3$
	Days $>50\mu\text{g}/\text{m}^3$	15	4	35 days
Dublin Port	Annual Mean PM_{10}	-	20	$40 \mu\text{g}/\text{m}^3$
	Days $>50\mu\text{g}/\text{m}^3$	-	7	35 days
Finglas	Annual Mean PM_{10}	13	12	$40 \mu\text{g}/\text{m}^3$
	Days $>50\mu\text{g}/\text{m}^3$	2	0	35 days
Marino	Annual Mean PM_{10}	14	13	$40 \mu\text{g}/\text{m}^3$
	Days $>50\mu\text{g}/\text{m}^3$	4	0	35 days

8.3.2 Macroclimate

Ireland has a typical maritime climate, largely due to its proximity to the Atlantic Ocean and the presence of the Gulf Stream. Due to the moderating effects of the Gulf Stream, Ireland does not suffer the temperature extremes that are experienced by many other countries at a similar latitude. Mean annual temperatures generally range between 9°C and 10°C . Winters tend to be cool and windy while summers are mostly mild and less windy. The prevailing wind direction is between the south and west with average annual wind speeds ranging between 6 knots in parts of south Leinster to over 15 knots in the extreme north. Rainfall in Ireland occurs throughout the year with reasonable frequency. The highest rainfall occurs in the western half of the country and on high ground, and generally decreases towards the northeast. As the prevailing winds are from the west-southwest, the west of Ireland experiences the largest number of wet days. The area of least precipitation is along the eastern seaboard of the country.

8.3.3 Microclimate

The synoptic meteorological station at Dublin Airport is located approximately 6km northwest of the Proposed Development; and for the purposes of this chapter, weather data collected here may be considered similar to that which is experienced in the area of the subject Site.

The weather in the area of the subject Site is generally dominated by cool oceanic air masses, with cool winters, mild humid summers, and a lack of temperature extremes. Based on meteorological data at Dublin Airport over the last 3 years, the mean January temperature is 5.3°C , while the mean July temperature is 15.4°C . The prevailing wind direction is from a quadrant centred on the southwest. These are moderately warm winds from the Atlantic and they habitually bring rain. The expected annual rainfall for the eastern half of the country ranges between 750 and 1000mm. Easterly winds are less frequent, weaker, and tend to bring cooler weather from the northeast in spring and warmer weather from the southeast in summer.

8.3.3.1 Rainfall

Rainfall is a key indicator of changes in climate, as measurements of rainfall are fundamental to assessing the effects of climate change on the water cycle and water balance. Table 8-4 illustrates the monthly and annual rainfall data collected over a 3-year period (2018-2020) at Dublin Airport Weather Station. The annual rates of precipitation ranged from 709.4mm in 2018 to 886.1mm in 2019 with distribution of the highest monthly rainfall values falling mainly in the autumn and winter months. This is broadly within the expected range of the eastern half of the country.

Table 8-4: Monthly Rainfall Values (mm) for Dublin Airport Weather Station from January 2018 to December 2021 (Source: Met Eireann)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2021	115.1	55.0	32.1	10.8	83.5	12.6	72.9	65.3	42.0	78.8	11.7	85.5	666.6
2020	36.0	130.4	31.8	12.8	9.3	69.6	98.9	87.3	60.9	80.6	48.1	83.1	748.8
2019	26.8	30.5	92.5	74.6	33.4	82.9	41.0	91.9	104.6	77.2	173.0	57.7	886.1
LTA⁶	62.6	48.8	52.6	54.1	59.5	66.7	56.2	73.3	59.5	79.0	72.9	72.7	757.9

8.3.3.2 Wind

Wind at a particular location can be influenced by a number of factors, such as obstructions by trees or buildings, the nature of the terrain, and deflection by nearby mountains or hills. Wind blows most frequently from the south and west for open sites while winds from the northeast and north occur less often. The analysis of hourly weather data from Dublin Airport synoptic weather station over a period of 5 years suggests that the predominant wind direction blows from the southwest, with windspeeds of between 7 and 10 knots occurring most frequently.

Figure 8-2 provides a wind speed frequency distribution which represents wind speed classes and the frequency at which they occur (% of time) at Dublin Airport weather station over a period of 5 years. Wind speeds of 8 knots have the highest frequency, occurring approximately 8.6% of the time.

⁶ The 'LTA' is average for the climatological long-term-average (LTA) reference period 1981-2010

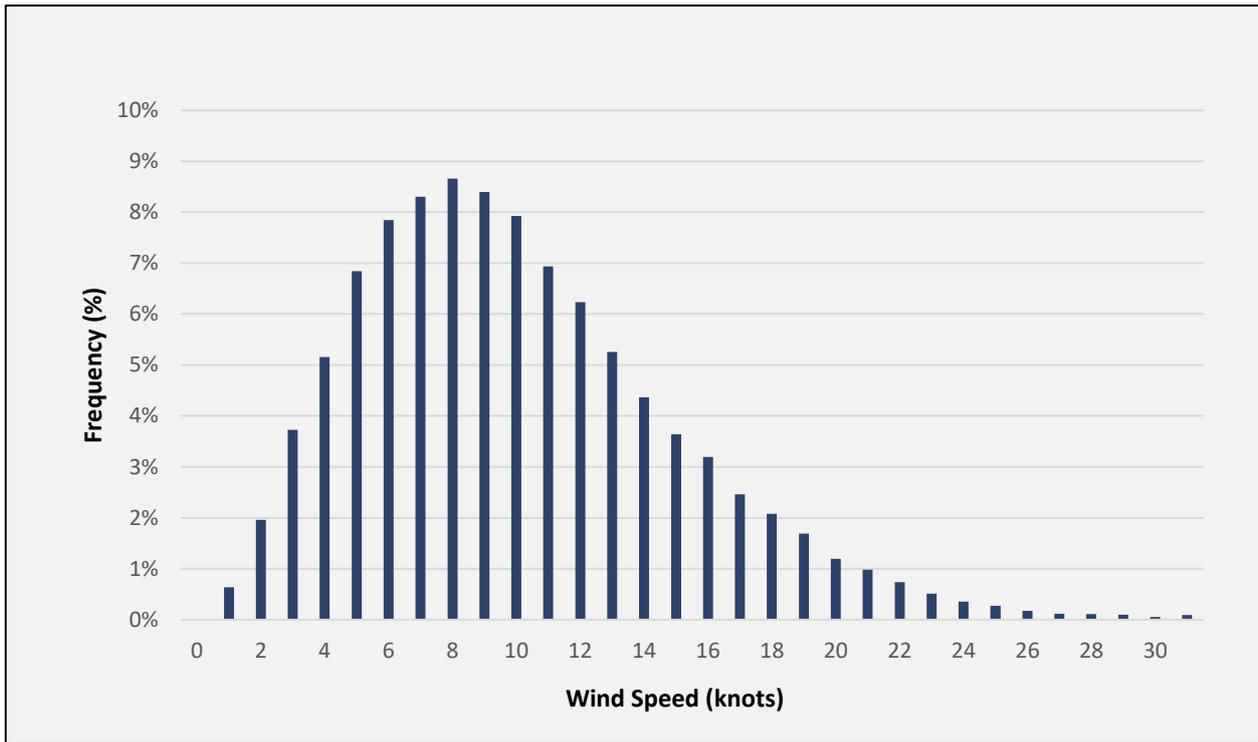


Figure 8-2: Wind Speed Frequency Distribution at Dublin Airport Synoptic Weather Station over 5 years (2016-2020)

Figure 8-3 provides a wind rose of the predominant wind directions and associated wind speeds at Dublin Airport. As is visible from Figure 8-3, the prevailing wind is from a south-westerly direction with an annual incidence of 33% for winds between 200 and 250 degrees. The most frequent wind speed associated with this wind direction is between 11 and 16 knots which is considered a ‘moderate breeze’ in terms of the Beaufort scale, this wind direction and wind speed occurs in combination approximately 11.39% of the time. The overall most common windspeed is between 7 and 10 knots, occurring in 33.28% of incidences, and wind speeds of between 11 and 16 knots occurring in 29.63% of incidences.

The lowest frequency is for winds blowing from the northern quadrant at approximately 2.81% of the time. The incidence of wind between 1 and 6 knots is about 26.16% of the year with wind speeds of above 17 knots (8.7 m/s) occurring in just 10.92% of incidences. The influence of topography can be seen in the low frequency of winds from a southerly direction at Dublin Airport, which occur at 4.24% of the year; this is due to the sheltering effect of the mountains to the south. This windrose is broadly representative of the prevailing conditions experienced at the subject Site.

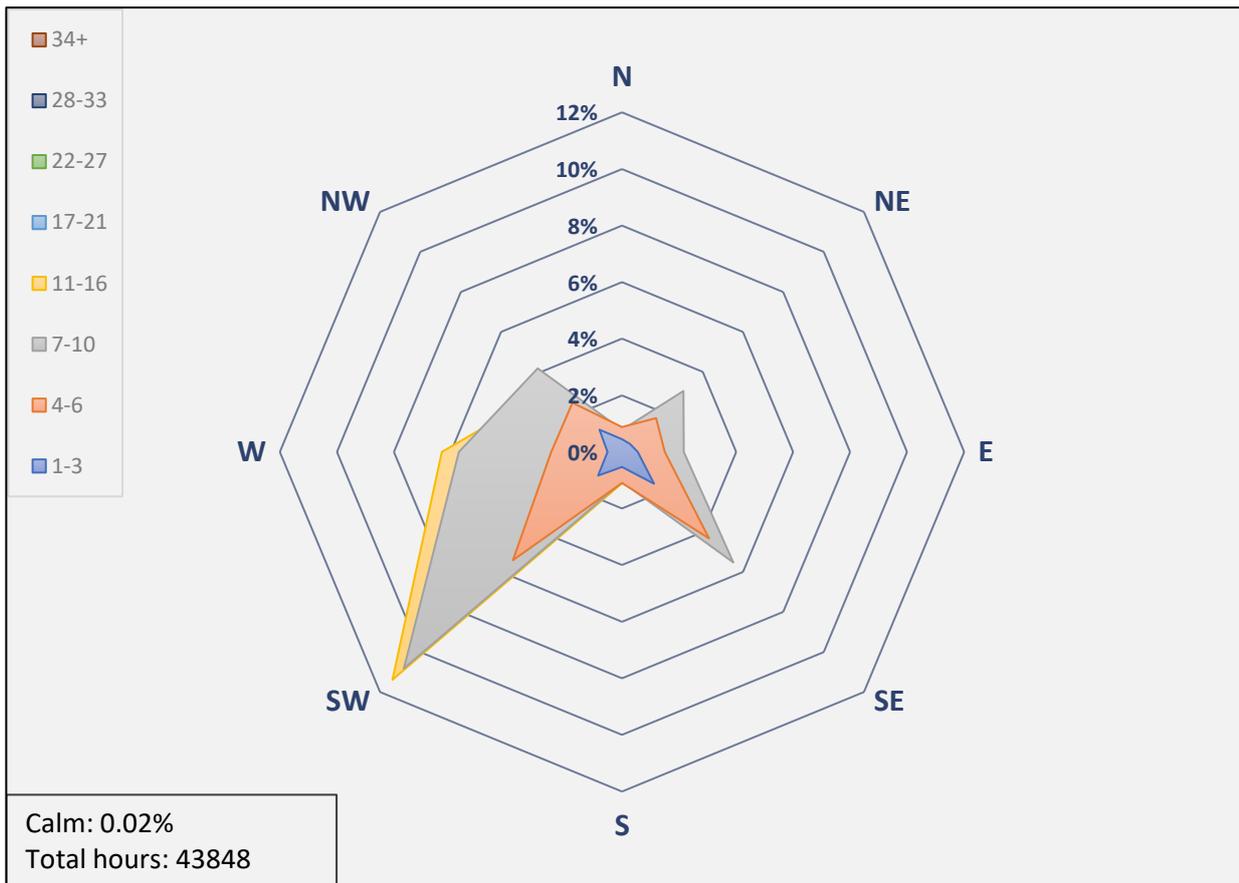


Figure 8-3: 5-year Windrose at Dublin Airport Synoptic Weather Station 2016-2020
 (Developed using Met Eireann Hourly Data)

8.4 Characteristics of the Proposed Development

The Proposed Development consists of the construction of a residential and nursing home development set out in 7 no. blocks, ranging in height from 4-7 storeys to accommodate 580 no. apartments, residential tenant amenity spaces, a crèche and a 100-bed nursing home. The site will accommodate car parking spaces, bicycle parking spaces, storage, services and plant areas at both basement and podium level.

Landscaping will include extensive communal amenity areas, and a significant public open space provision on the east and south of the site. The proposed application includes all site landscaping works, green roofs, substations, boundary treatments, lighting, servicing, signage, surface water attenuation facilities and associated and ancillary works, including site development works and services above and below ground. For a full description of the Proposed Development please refer to the Statutory Notices.

8.5 Potential Impact of the Proposed Development

8.5.1 Potential Impacts on Air Quality

8.5.1.1 Construction Phase

The Proposed Development is to be constructed in two stages which will include, in broad terms, the following:

- Stage I: Site demolition works, site clearance and preparation work for the construction. A site compound including offices and welfare facilities will be set up by the Main Contractor.
- Stage II: Site development and construction. The development includes all associated site works and infrastructure which includes roads, utilities, foul and surface water drainage.

The Construction Phase is intended to be an 18-month programme. The operational hours for the site will be 08:00 to 17:00 Mondays to Fridays and 08:00 to 14:00 Saturdays. No work is permitted on Sundays or public holidays. Deviation from these hours will only be allowed in exceptional circumstance with prior written approval from the planning authority.

There is potential for construction related air emissions to impact on local air quality as a result of the Proposed Development. Potential impacts are expected to be short-term and of a temporary nature. The main air quality impacts that may arise during construction activities are:

- Dust deposition;
- Elevated particulate matter concentrations (PM_{10} and $PM_{2.5}$) as a result of dust generating activities on Site; and
- An increase in concentrations of airborne particles, volatile organic compounds, nitrogen oxides, and sulphur oxides due to exhaust emissions from diesel powered vehicles and equipment on Site (non-road mobile machinery) and vehicles accessing the Site.

The greatest potential impact on air quality during this phase is from construction dust emissions and the potential for nuisance dust. The dust emissions from a construction site that may result in air quality impacts generally depend on:

- Site activities and duration;
- The size of the site;
- The meteorological conditions;
- The proximity of receptors to the activities;
- The adequacy of applied mitigation measures; and

- The sensitivity of receptors to dust.

The primary sources of dust identified include soil excavation works, demolition, bulk material transportation, loading and unloading, stockpiling materials, cutting and filling, and vehicular movements (HGVs and on-site machinery).

According to Transport Infrastructure Ireland guidelines (TII, 2011), it is difficult to accurately quantify dust emissions arising from construction activities. Therefore, it is not possible to easily predict changes to dust soiling rates or PM₁₀ concentrations. TII recommend a semi-quantitative approach to determine the likelihood of significant impact in this instance. This should also be combined with an assessment of the proposed mitigation measures. The following table outlines the distance criteria which is recommended for use in assisting a semi-quantitative assessment:

Table 8-5: Assessment Criteria for the Impact of Dust Emissions from Construction Activities, with Standard Mitigation in Place

Source		Potential Distance for Significant Effects (Distance from source)		
Scale	Description	Soiling	PM10	Vegetation effects
Major	Large construction sites, with high use of haul routes	100m	25m	25m
Moderate	Moderate sized construction sites, with moderate use of haul routes	50m	15m	15m
Minor	Minor construction sites, with limited use of haul routes	25m	10m	10m

In order to account for a worst-case scenario, the Proposed Development can be considered major in scale due to the size of the Site and the duration of construction activities. Therefore, it can be assumed that there is potential for significant dust soiling 100m from the Site.

Sensitive receptors within 100m of the Proposed Development have been identified as a school and a residential housing estate which are located to the west of the Site.

According to IAQM Guidance (2016), the primary factor influencing the Pathway is the distance between the sensitive receptor and the dust sources. However, other factors can cause a higher or a lower category to be assigned than would be the case based on distance alone. These factors include:

- Orientation of receptors relative to the prevailing wind direction; and
- Topography, terrain and physical features.

Meteorological conditions greatly affect the level of dust emissions and subsequent deposition downwind of the source; the most predominant being rainfall and wind speed. Adverse impacts can occur in any direction from a site; however, they are more likely to occur downwind of the prevailing wind direction and/or close to the site. Relatively high levels of moisture in the surrounding air, soils, and precipitation helps to suppress dust due to the cohesive properties of water between dust particles. The least favourable meteorological conditions for dust generation would typically be warm days with strong winds and low precipitation. Due to the variability of weather, it is impossible to predict the conditions that will occur during the Construction Phase of the development. However, wind direction is most likely to prevail from the southwest.

Table 8-6 outlines the hourly percentage distribution of wind speed and direction at Dublin Airport synoptic weather station over a 5-year period (2016-2020). This data is consistent with Figure 8-3 of this chapter and shows that the most frequent wind direction prevails from the southwest (33.89% frequency). The corresponding most frequent wind speed is between 7 and 10 knots which is considered a 'gentle breeze' in terms of the Beaufort scale; this wind direction and wind speed occurs in combination approximately 12.28% of the time.

Table 8-6: Percentage Distribution of Wind Speeds and Direction at Dublin Airport (2016-2020)

Wind speed (Knots)		<1	1 - 3	4 - 6	7 - 10	11-16	17-21	22-27	28-33	34+	% Dry Days
Wind Direction	Degrees										
North	350 - 10	0.03	0.54	0.91	0.61	0.61	0.11	0.01	0.00	0.00	40%
North-east	20 - 70		0.54	2.15	3.89	2.78	0.98	0.05	0.00	0.00	
East	80 - 100		0.94	1.92	2.22	1.2	0.23	0.00	0.00	0.00	
South-east	110 - 150		1.48	3.01	4.87	2.31	0.54	0.06	0.00	0.00	
South	170 - 190		0.64	0.98	1.35	1.33	0.36	0.07	0.00	0.00	
South-west	200 - 250		0.98	5.89	12.28	12.14	2.29	0.32	0.00	0.00	
West	260 - 280		0.59	2.69	5.57	5.73	1.79	0.3	0.00	0.00	
North-west	290 - 340		1.13	2.37	4.38	3.61	1.09	0.15	0.00	0.00	

Dry days with moderate to high windspeeds (above 5m/s (7-10 knots)) are the conditions which are most likely to result in fugitive dust emissions. Sensitive receptors within 100m of the Proposed Development have been identified as a school (St. Paul's College) and a residential housing estate (The Meadows) which are located to the west of the Site. Receptors located to the west of the Site would require prevailing winds from the east to be potentially impacted by fugitive dust emissions. At these receptors, the frequency of winds (>5m/s) occurring from the direction of the dust source on dry days is 2.6%. Therefore, appropriate conditions for fugitive dust emissions at these receptors are highly infrequent and it is expected

that adequate mitigation measures, as outlined in Section 8.6.1, will prevent nuisance dust from resulting in any adverse impacts. Furthermore, the trees and hedgerows which are currently present on the boundary of the Proposed Development will act as a natural buffer for dust deposition. Therefore, adverse impacts from dust suspension and/or deposition are not expected to occur, however appropriate mitigation measures will be recommended to further minimise the risk of such impacts occurring.

Construction vehicles and machinery during this phase will temporarily and intermittently generate exhaust fumes and consequently potential emissions of volatile organic compounds, nitrogen oxides, sulphur oxides, and particulate matter (dust). Dust emissions associated with vehicular movements are largely due to the resuspension of particulate materials from ground disturbance. According to the IAQM (2014), experience from the assessment of exhaust emissions from on-site machinery and Site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed. Air pollutants may increase marginally due to construction-related traffic and machinery from the Proposed Development. However, any such increase is not considered significant and will be well within relevant ambient air quality standards. According to TII (2011), the significance of impacts due to vehicle emissions during the Construction Phase will be dependent on the number of additional vehicle movements, the proportion of HGVs and the proximity of sensitive receptors to Site access routes. If construction traffic would lead to a significant change (> 10%) in Annual Average Daily Traffic (AADT) flows near to sensitive receptors, then concentrations of nitrogen dioxide, PM₁₀ and PM_{2.5} should be predicted in line with the methodology as outlined within TII guidance. Construction traffic is not expected to result in a significant change (> 10%) in AADT flows near to sensitive receptors. Therefore, a detailed air quality assessment is not required.

8.5.1.2 Operational Phase

The greatest potential effect on air quality during the Operational Phase of the Proposed Development is from traffic-related air emissions.

Operational traffic will use regional and local roads to access the facility with potential increases of traffic flow on some roads and subsequent associated emissions of VOCs, nitrogen oxides, sulphur dioxides and increased particulate matter concentrations.

In terms of associated impacts on air quality, Table 8-7 outlines the criteria that are prerequisite for an air quality assessment:

Table 8-7: Indicative Criteria for Requiring an Air Quality Assessment (Source: IAQM, 2017)

Potential Change resulting from Proposed Development	Indicative Criteria to Proceed to an Air Quality Assessment
Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors	A change of LDV flows of more than 1000 Annual Average Daily Traffic (AADT)
Cause a significant change in Heavy Duty Vehicle (HGV) flows on local roads with relevant receptors	A change of HGV flows of more than 100 Annual Average Daily Traffic (AADT)
Realign roads, i.e., changing the proximity of receptors to traffic lanes	Where the change is 5m or more
Cause a change in Daily Average Speed (DAS)	Where the DAS will change by 10 km/h or more
Cause a change in peak hour speed	Where the peak hour speed will change by 20km/h or more.

The UK Highways Agency Design Manual for Roads and Bridges (DMRB) air quality guidance (LA 105) provides a framework for assessing, mitigating, and reporting the effects of road schemes on air quality; however, this can be adapted to any development which results in a change in traffic.

The criteria as set out in Table 8-8 have been used to determine the project's risk potential to the receiving environment, and whether a simple or detailed air quality assessment is required:

Table 8-8: Receiving Environment Sensitivity (Source: DMRB LA 105)

Sensitivity	Features of receiving environment
High	<ol style="list-style-type: none"> 1) Large number of receptors (human and / or ecological) within 50m of roads triggering traffic screening criteria; 2) Baseline monitoring data indicates concentrations above the AQS Objective / EU limit value; 3) Monitoring indicates exceedances of short term AQS Objectives / EU limit value; 4) Projecting forward monitored concentrations to the opening year, indicates exceedances of AQS Objectives / EU limit value; 5) AQMAs or reported EU limit value exceedances within project's study area.
Medium	<ol style="list-style-type: none"> 1) Receptors (human or ecological) within 50m of roads triggering traffic change criteria; 2) Baseline monitoring data illustrates annual mean NO₂ concentrations >36µg/m³; 3) Projections indicate annual mean NO₂ concentrations>36µg/m³ in opening year; 4) AQMAs or EU limit value exceedances within project's study area.
Low	<ol style="list-style-type: none"> 1) Few receptors located close to roads triggering traffic change criteria; 2) Baseline monitoring data illustrates concentrations in base year below an annual mean of 36µg/m³; 3) No AQMAs or EU limit value exceedances within project's study area.

As outlined in the following sections, there are a number of high-sensitivity receptors located in close proximity to the affected road network. However, baseline pollutant concentrations are well below an annual mean of 36 µg/m³ and there are no exceedances of EU limit values within the study area. Therefore, in accordance with Table 8-8, it is considered that the receiving environment of the Proposed Development is of a 'Low Sensitivity' and the inclusion of the Proposed Development can be considered low risk. Therefore, in line with DMRB LA 105 guidance, it has been determined that simple air quality assessment is required in this case.

8.5.1.2.1 UK Design Manual for Roads and Bridges Screening Model (V. 1.03c 2007)

The impact of the Operational Phase of the Proposed Development has been assessed by use of the UK DMRB screening model (Version 1.03c 2007). The DMRB screening model provides a simple and straightforward means of predicting pollutant concentrations associated with road traffic emissions from the Proposed Development. According to Transport Infrastructure Ireland Guidelines (TII, 2011), this method is a suitable approach in circumstances where the predicted environmental concentrations (i.e., ambient background + predicted concentration) lie sufficiently below the air quality standards (<90% of the standard).

Where predicted concentrations approach or exceed the air quality standards/limit values, a detailed air quality assessment must be carried out.

The DMRB modelling tool requires the following inputs to complete the assessment: road types, receptor locations, annual average daily traffic movements (AADT), percentage heavy goods vehicles (%HGV), annual traffic speeds and background pollutant concentrations. This input data is utilised by the model in predicting the Proposed Development road traffic contribution to ambient ground level concentrations at the worst-case sensitive receptor. The DMRB modelling tool predicts annual mean concentrations of NO_x and PM₁₀. The road NO_x concentration is then converted to NO₂ using the latest-available version of UK Department for Environment, Food and Rural Affairs (DEFRA) NO_x to NO₂ conversion spreadsheet (version 8.1). Concentrations of carbon monoxide (CO) and benzene (Bz) are consistently and significantly below their air quality limit values, even in urban centres, therefore modelling of these pollutants is no longer necessary (EPA Annual Air Quality Reports).

As the tool does not account for electric or hybrid vehicle use, vehicle emissions applied in this study are likely to overestimate the actual vehicle emissions experienced from the Proposed Development. The worst-case contributions predicted by the tool are added to the existing background concentration to provide a worst-case predicted ambient concentration. The compliance of the Proposed Development with the relevant ambient air quality standards is subsequently assessed by comparison with the worst-case ambient concentrations.

8.5.1.2.1.1 Sensitive Receptors

TII (2011) define sensitive receptor locations as: residential housing, schools, hospitals, places of worship, sports centres, and shopping areas, i.e., locations where members of the public are likely to be regularly present. According to the DMRB LA 105 guidance, sensitive receptors will be chosen within 200m of the Affected Road Network (ARN) and include residential properties, schools, and hospitals for the assessment of annual mean air quality thresholds. Where there is a risk of the short-term air quality thresholds being exceeded, then sensitive receptor locations including gardens and playing fields will be assessed. In the current assessment, a number of high-sensitivity receptors such as residential properties, a school, and a medical centre were identified within 200m of the ARN.

According to the DMRB LA 105 guidance, it is not necessary to model all receptors within 200m or an excessive number of receptors in the same area to determine whether there is likely to be any exceedances in the do nothing or do something scenarios.

For the purpose of determining local air quality impacts, seven (7 No.) receptors were included in this modelling assessment, and these have been identified in the following Table 8-9. The receptors modelled will represent the worst-case locations in the vicinity of the Proposed Development and were chosen based on proximity (within 200m) to the road links affected by the Proposed Development:

Table 8-9: Sensitive Receptors

Name	Type	X	Y
R1	Residential	686554	5917852
R2	Residential	686564	5917722
R3	Residential	686694	5917691
R4	Nursing Home	686603	5917558
R5	School	686700	5917405
R6	Medical Centre	686661	5917041
R7	Residential	686640	5916411

Designated sites of ecological conservation importance within 200m of the ARN are required to be included in the air quality assessment. This includes special protection areas, special areas of conservation, natural heritage areas, and nature reserves. Only sites that are sensitive to nitrogen deposition should be included in the assessment, it is not necessary to include sites such as those which have been designated as a geological feature or water course. No Sites of ecological conservation importance have been identified within 200m of the ARN; therefore, this analysis has been excluded in the current assessment.

8.5.1.2.1.2 Traffic Data

The traffic data used in this assessment has been provided by Waterman Moylan Engineering Consultants and is shown in the following Table 8-10, with the percentage of HGV included below the AADT.

Table 8-10: Traffic Data Applied to the DMRB Model

Link Number	Road Name	Base Year (2021)	Opening Year (2025)		Design Year (2040)		Speed (Km/h)
			Do Nothing	Do Something	Do Nothing	Do Something	
		AADT	AADT	AADT	AADT	AADT	
1	Brookwood Ave	12,430 (1%HGV)	13,250 (1%HGV)	13,307 (1%HGV)	15,040 (1%HGV)	15,097 (1%HGV)	50
2	R105 Howth Road Eastern Arm	16,645 (3%HGV)	17,744 (3%HGV)	17,800 (3%HGV)	20,141 (3%HGV)	20,197 (3%HGV)	60
3	R808 Sybil Hill Road	7,822 (1%HGV)	8,338 (1%HGV)	8,394 (1%HGV)	9,464 (1%HGV)	9,521 (1%HGV)	50
4	R105 Howth Road Western Arm	15,150 (3%HGV)	16,150 (3%HGV)	16,207 (3%HGV)	18,332 (3%HGV)	18,388 (3%HGV)	60

Link Number	Road Name	Base Year (2021)	Opening Year (2025)		Design Year (2040)		Speed (Km/h)
			Do Nothing	Do Something	Do Nothing	Do Something	
		AADT	AADT	AADT	AADT	AADT	
5	R808 Sybil Hill Road Northern Arm	7,491 (2%HGV)	7,986 (2%HGV)	8,270 (2%HGV)	9,064 (2%HGV)	9,349 (2%HGV)	50
6	St. Paul's Access Road	359 (1%HGV)	365 (1%HGV)	1,092 (1%HGV)	414 (1%HGV)	1,141 (1%HGV)	30
7	R808 Sybil Hill Road Southern Arm	7,822 (2%HGV)	7,780 (2%HGV)	8,064 (2%HGV)	8,831 (2%HGV)	9,115 (2%HGV)	50
8	R808 Sybil Hill Road Northern Arm	7,299 (1%HGV)	7,604 (1%HGV)	7,888 (1%HGV)	8,631 (1%HGV)	8,915 (1%HGV)	50
9	R808 Sybil Hill Road Southern Arm	359 (2%HGV)	1,084 (2%HGV)	1,811 (2%HGV)	414 (2%HGV)	1,141 (2%HGV)	50
10	Vernon Avenue	4,408 (2%HGV)	4,699 (2%HGV)	4,983 (2%HGV)	5,333 (2%HGV)	5,618 (2%HGV)	50
11	R808 Sybil Hill Road	6,307 (4%HGV)	6,723 (4%HGV)	6,879 (4%HGV)	7,631 (4%HGV)	7,787 (4%HGV)	50
12	Vernon Avenue	5,567 (1%HGV)	5,849 (1%HGV)	6,005 (1%HGV)	6,464 (1%HGV)	6,620 (1%HGV)	50
13	Sea Field Road West	3,242 (1%HGV)	588 (1%HGV)	744 (1%HGV)	668 (1%HGV)	823 (1%HGV)	50
14	Vernon Avenue	4,101 (2%HGV)	4,371 (2%HGV)	4,449 (2%HGV)	4,962 (2%HGV)	5,040 (2%HGV)	50
15	R807 Clontarf Road Western Arm	17,377 (4%HGV)	18,524 (4%HGV)	18,602 (4%HGV)	21,027 (4%HGV)	21,104 (4%HGV)	50

8.5.1.2.1.3 Pollutants and Background Concentrations

The DMRB modelling tool predicts annual mean concentrations of NO_x and PM₁₀. The road NO_x concentration is then converted to NO₂ using the latest published version of DEFRA's NO_x to NO₂ conversion spreadsheet (version 8.1). Concentrations of carbon monoxide (CO), and benzene (Bz) are consistently and significantly below their air quality limit values, even in urban centres, therefore modelling of these pollutants is no longer necessary (EPA Annual Air

Quality Reports). According to the DMRB LA 105 guidance, it is only necessary to model PM₁₀ for the base year to demonstrate that there is no impact on achievements of the PM₁₀ air quality thresholds as a result of the project. Where air quality monitoring indicates exceedances of the PM₁₀ air quality thresholds in the base year, PM₁₀ should then be included in the model for both the 'do nothing' and 'do something' scenarios. As Ireland currently meets its legal requirements for the achievement of the PM_{2.5} air quality thresholds, there is no requirement to model this parameter. Additionally, the modelling of PM₁₀ can be used to demonstrate that the project does not impact on the PM_{2.5} air quality threshold.

Annual mean of NO₂ and PM₁₀ for the years 2019-2020 have been obtained from EPA monitoring data at 'Zone A' stations. For both parameters, annual limits are within the threshold limits contained within the regulations and have decreased in 2020 compared to previous years due to the COVID-19 pandemic.

Background concentrations for the Opening Year (2025) and Design Year (2040) have been predicted for the air quality assessment. Baseline year (2021) background concentrations have been used in combination with correction factors to estimate annual average NO₂ concentrations in future years. These factors have been adapted from both TII (2011) and DEFRA roadside NO₂ projection factors.

Adjustments to the verified modelled NO₂ concentrations are required to be made in order to account for future roadside NO₂ concentrations. An additional scenario known as the projected base year is to be included in the air quality modelling to enable a gap analysis to be completed. The gap analysis is the application of adjustment factors which take into consideration the assumed roadside rates of reduction in NO_x and NO₂ by DEFRA's modelling tools compared to observed roadside monitoring trend i.e., the gap between the predicted reductions and those observed (DMRB LA 105 guidance). This methodology has been applied to the current assessment in order to predict future NO₂ concentrations as a result of the Proposed Development and ensure that these concentrations are not under-estimated.

8.5.1.2.1.4 Determining the Impact

The TII guidance document 'Guidelines for the Treatment of Air Quality during the Planning and Construction of Road Schemes (2011)' outlines a clear methodology for determining the magnitude and significance of air quality impacts associated with road schemes; however, this remains applicable to any project which results in a change to traffic volumes. The TII significance criteria have been applied to the Proposed Development and adapted as necessary within the following tables (8-11 to 8-14).

Tables 8-11 to 8-14 have been designed to assist in describing the air quality impacts at each receptor. They are applicable to the pollutants which are relevant to the Proposed Development and the standards or limit values against which they are being assessed (TII, 2011). The criteria focus on NO₂ and PM₁₀ as these pollutants are most likely to exceed the annual mean limit values (40 µg/m³).

The definition of 'impact magnitude' is exclusively related to the degree of change in pollutant concentrations, expressed as micrograms per cubic metre (µg/m³). 'Impact description' takes account of the impact magnitude and of the absolute concentrations and how they are linked to the air quality standards or limit values. The descriptors for the magnitude of change due to the Proposed Development are set out in Table 8-11:

*Table 8-11: Definition of Impact Magnitude for Changes in Ambient Pollutant Concentrations
 (Source: Adapted from TII, 2011)*

Magnitude of Change	Annual Mean NO ₂ /PM ₁₀	No. days with PM ₁₀ concentration greater than 50 µg/m ³
Large	Increase/decrease ≥4 µg/m ³	Increase/decrease >4 days
Medium	Increase/decrease 2 - <4 µg/m ³	Increase/decrease 3 or 4 days
Small	Increase/decrease 0.4 - <2 µg/m ³	Increase/decrease 1 or 2 days
Imperceptible	Increase/decrease <0.4 µg/m ³	Increase/decrease <1 day

The subsequent impact descriptors are set out in Table 8-12 and Table 8-13:

Table 8-12: Air Quality Impact Descriptors for Changes to Annual Mean NO₂ and PM₁₀ Concentrations at Receptor (Source: Adapted from TII, 2011)

Absolute Concentration in Relation to Objective/Limit Value	Change in Concentration ⁷		
	Small	Medium	Large
Increase with Scheme			
Above Objective/Limit Value with Scheme ($\geq 40 \mu\text{g}/\text{m}^3$ of NO₂ or PM₁₀)	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective/Limit Value with Scheme ($36 < 40 \mu\text{g}/\text{m}^3$ of NO₂ or PM₁₀)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value with Scheme ($30 < 36 \mu\text{g}/\text{m}^3$ of NO₂ or PM₁₀)	Negligible	Slight Adverse	Slight Adverse
Well Below Objective/Limit Value with Scheme ($< 30 \mu\text{g}/\text{m}^3$ of NO₂ or PM₁₀)	Negligible	Negligible	Slight Adverse
Decrease with Scheme			
Above Objective/Limit Value with Scheme ($\geq 40 \mu\text{g}/\text{m}^3$ of NO₂ or PM₁₀)	Slight Beneficial	Moderate Beneficial	Substantial Beneficial
Just Below Objective/Limit Value with Scheme ($36 < 40 \mu\text{g}/\text{m}^3$ of NO₂ or PM₁₀)	Slight Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value with Scheme ($30 < 36 \mu\text{g}/\text{m}^3$ of NO₂ or PM₁₀)	Negligible	Slight Beneficial	Slight Beneficial
Well Below Objective/Limit Value with Scheme ($< 30 \mu\text{g}/\text{m}^3$ of NO₂ or PM₁₀)	Negligible	Negligible	Slight Beneficial

⁷ Where the Impact Magnitude is Imperceptible, then the Impact Description is Negligible.

Table 8-13: Air Quality Impact Descriptors for Changes to Number of Days with PM10 Concentration Greater than 50 µg/m³ at a Receptor (Source: TII, 2011)

Absolute Concentration in Relation to Objective/Limit Value	Change in Concentration ⁸		
	Small	Medium	Large
Increase with Scheme			
Above Objective/Limit Value with Scheme (≥35 days)	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective/Limit Value with Scheme (32-<35 days)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value with Scheme (26-<32 days)	Negligible	Slight Adverse	Slight Adverse
Well Below Objective/Limit Value with Scheme (<26 days)	Negligible	Negligible	Slight Adverse
Decrease with Scheme			
Above Objective/Limit Value with Scheme (≥35 days)	Slight Beneficial	Moderate Beneficial	Substantial Beneficial
Just Below Objective/Limit Value with Scheme (32-<35 days)	Slight Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value with Scheme (26-<32 days)	Negligible	Slight Beneficial	Slight Beneficial
Well Below Objective/Limit Value with Scheme (<26 days)	Negligible	Negligible	Slight Beneficial

In terms of 'significance of effects', professional judgment has been applied in making this determination. The TII Guidance (2011) outlines that the overall air quality impact of the Proposed Development should be described as either 'insignificant', 'minor', 'moderate', or 'major'; and a number of factors, as listed in Table 8-14, are set out which should be taken into account:

⁸ Where the Impact Magnitude is Imperceptible, then the Impact Description is Negligible.

Table 8-14: Factors to Consider when Determining Air Quality Significance (Source: Adapted from TII, 2011)

Factors
Number of people affected by increases and/or decreases in concentrations and a judgement on the overall balance.
The number of people exposed to levels above the objective or limit value, where new exposure is being introduced.
The magnitude of the changes and the descriptions of the impacts at the receptors i.e., using the findings based on Boxes Tables 8-11 to 8-13.
Whether or not an exceedance of a standard or limit value is predicted to arise in the study area where none existed before, or an exceedance area is substantially increased.
Whether or not the study area exceeds a standard or limit value and this exceedance is removed, or the exceedance area is reduced.
Uncertainty, including the extent to which worst-case assumptions have been made
The extent to which a standard or limit value is exceeded, e.g., an annual mean NO ₂ of 41 µg/m ³ should attract less significance than an annual mean of 51 µg/m ³

8.5.1.2.1.5 Modelling Results

The impact of the Proposed Development has been determined by modelling traffic-related air emissions resulting from the presence or absence of Proposed Development.

Concentrations of NO₂ and PM₁₀ were modelled for the baseline year of 2021. As is evident from Table 8-15, the model has indicated that concentrations for all pollutants were in compliance with the annual limit of 40 µg/m³. Therefore, in line with DMRB LA 105 guidance, further modelling of PM₁₀ for the Opening and Design Years is not required. The highest concentration of PM₁₀ experienced at receptors was 1.54 µg/m³. When this is assessed in combination with the 2021 background concentration of 12 µg/m³, an overall impact of 33.9% of the annual limit is experienced at the worst-case receptor.

The impact of NO₂ was predicted for the Opening and Design Years at the nearest receptors to the affected road network (ARN). The degree of impact has been determined based on both the absolute and relative impact of the Proposed Development. A 'Do-Nothing Scenario', which assumes that the Proposed Development does not exist in future years, has also been assessed within the model and results have been compared in order to determine the degree of impact.

Table 8-15: Baseline NO₂ and PM₁₀ Concentrations (2021)

Receptor	Receptor Type	Parameter	Background Concentration (µg/m ³)	ARN Contribution
R1	Residential	PM ₁₀	12	0.72
		NO ₂	18	4.69
R2	Residential	PM ₁₀	12	1.54
		NO ₂	18	9.09
R3	Residential	PM ₁₀	12	0.55
		NO ₂	18	4.29
R4	Nursing Home	PM ₁₀	12	0.29
		NO ₂	18	2.8
R5	School	PM ₁₀	12	0.26
		NO ₂	18	2.6
R6	Medical Centre	PM ₁₀	12	0.4
		NO ₂	18	3.22
R7	Residential	PM ₁₀	12	0.48
		NO ₂	18	3.63

The impact of the Proposed Development on annual mean NO₂ concentrations in the Opening Year (2025) and Design Year (2040) have been assessed relative to the 'Do Nothing' levels. The results shown in Table 8-16 and 8-17 determine that there may be some 'imperceptible' increases and decreases in concentrations of NO₂ at worst-case receptors assessed when compared with 'Do Nothing' levels. When results are compared to baseline levels (2021), all results are considered 'Imperceptible', with the highest predicted increase (0.35 µg/m³) between baseline and the Design Year 'Do Something' measured at R2.

Having regard to the assessment criteria set out in Determining the Impact Section 8.5.1.2.1.4, and the modelling results outlined in Table 8-16 and Table 8-17, the impact of the Proposed Development on NO₂ concentrations in the locality is likely to be 'long-term', 'negative' and 'imperceptible'. The overall impact of the Proposed Development is insignificant in terms of ambient air quality standards.

Table 8-16: Predicted Annual Mean Concentrations of NO₂ (Opening Year 2025)

Receptor	Parameter	Background (µg/m ³)	Opening Year 2025				
			Do Nothing	Do Something	Proposed Development Contribution	Magnitude	Impact description
R1	NO ₂	14.4	19.08	19.09	0.01	Imperceptible	Negligible Increase
R2	NO ₂		23.37	23.39	0.02	Imperceptible	Negligible Increase
R3	NO ₂		18.58	18.59	0.01	Imperceptible	Negligible Increase
R4	NO ₂		17.07	17.13	0.06	Imperceptible	Negligible Increase
R5	NO ₂		16.84	15.83	-1.01	Small	Negligible Decrease
R6	NO ₂		18.07	17.79	-0.28	Imperceptible	Negligible Decrease
R7	NO ₂		17.65	17.72	0.07	Imperceptible	Negligible Increase

Table 8-17: Predicted Annual Mean Concentrations of NO₂ (Design Year 2040)

Receptor	Parameter	Background (µg/m ³)	Design Year 2040				
			Do Nothing	Do Something	Proposed Development Contribution	Magnitude	Impact description
R1	NO ₂	8.7	13.7	13.7	0.00	Imperceptible	Negligible Decrease
R2	NO ₂		18.12	18.14	0.02	Imperceptible	Negligible Increase
R3	NO ₂		12.99	12.99	0.00	Imperceptible	Negligible Decrease
R4	NO ₂		11.48	11.54	0.06	Imperceptible	Negligible Increase
R5	NO ₂		11.25	11.32	0.07	Imperceptible	Negligible Increase
R6	NO ₂		12.01	12.18	0.17	Imperceptible	Negligible Increase
R7	NO ₂		12.12	12.18	0.06	Imperceptible	Negligible Increase

In identifying sensitive receptors, consideration has been given to the averaging periods of the air quality standards. The receptors that have been subject to assessment in this study are areas where the public might reasonably be expected to be present for an hour or more. In this case, the short-term standard of the 1-hour mean for NO₂ has been considered. Analysis

has shown that statistically, on the basis of a dataset presented by DEFRA (2008), the chance of measuring an hourly NO₂ objective exceedance whilst reporting an annual mean NO₂ of less than 60 µg/m³ is very low. Therefore, having regard to the results outlined in Table 8-16 and Table 8-17, it is considered that the hourly limit criteria for NO₂ concentrations is highly unlikely to be exceeded at any receptors in the vicinity of the ARN as a result of the Proposed Development.

8.5.2 Potential Impacts on Climate

8.5.2.1 Construction Phase

Combustion emissions from onsite machinery and traffic derived pollutants of CO₂ and N₂O will be emitted during the construction phase of the development. However, due to the size and duration of the construction phase, and the mitigation measures proposed, the effect on national GHG emissions will be insignificant in terms of Ireland's obligations under the Kyoto Protocol and Paris Agreement and therefore will have no considerable impact on climate. Overall, climatic impacts are considered to be short-term and imperceptible.

8.5.2.2 Operational Phase

8.5.2.2.1 Microclimate

A Wind Microclimate Modelling study was performed by B-Fluid Ltd on behalf of Raheny 3 Limited Partnership for the Proposed Development. This study was carried out to identify the possible wind patterns around the area proposed, under mean and peak wind conditions typically occurring in Dublin, and also to assess the impact of wind on pedestrian level comfort.

A wind microclimate assessment is performed through advanced Computational Fluid Dynamics (CFD) which is a numerical method used to simulate wind conditions and its impact on the development and to identify areas of concern in terms of downwash/funnelling/downdraft/critical flow accelerations that may likely occur. The Advanced CFD numerical algorithms applied are solved using high performance computing cluster.

The results of this wind microclimate assessment have been utilised by Raheny 3 Limited Partnership to configure the optimal layout for the Proposed Development for the aim of achieving a high-quality environment for the scope of use intended for each area/building (i.e., comfortable, and pleasant for potential pedestrians) and not to introduce any critical wind impact on the surrounding areas and on the existing buildings.

The wind profile around the existing development environment was built using the annual average meteorology data collected at Dublin Airport Weather Station. In particular, the local wind climate was determined from historical meteorological data recorded 10m above ground level at Dublin Airport.

The Proposed Development has been designed in order to produce a high-quality environment that is attractive and comfortable for pedestrians of all categories. To achieve this objective, throughout the design process, the impact of wind has been considered and analysed, in the areas where critical patterns were found, the appropriate mitigation measures were introduced.

As a result of the final proposed and mitigated design, wind flow speeds at ground floor are shown to be within tenable conditions. The Proposed Development does not impact or give

rise to negative or critical wind speed profiles at the nearby adjacent roads, or nearby buildings. Moreover, in terms of distress, no critical conditions were found for “Frail persons or cyclists” and for members of the “General Public” in the surroundings of the development.

Therefore, the CFD study carried out has shown that under the assumed wind conditions typically occurring within Dublin for the past 30 years, the development is designed to be a high-quality environment for the scope of use intended for each area/building (i.e., comfortable and pleasant for potential pedestrians). A full copy of this report can be found in Appendix K.

8.5.2.2.2 Flood Risk

There is growing scientific consensus that the warming of the climate is expected to increase the risk of floods. Rising sea levels and more frequent and severe coastal storms will increase the risk of coastal and estuarial flooding as well as coastal erosion. According to the Planning System and Flood Risk Management (DECLG & OPW, 2009), where the floodplain or coastal plain is well defined, climate change is expected to change the probability of flooding and the depth for a particular event with little change in spatial extent. Only where extensive areas of land rise gently from the river or the sea is climate change expected to significantly increase the area affected by flooding.

There is a great deal of uncertainty in relation to the potential effects of climate change; therefore, a precautionary approach should be adopted, where necessary, to reflect uncertainties in flooding datasets and the ability to predict the future climate. Development should be designed with careful consideration to possible future changes in flood risk, including the effects of climate change so that future occupants are not subject to unacceptable risk (OPW, 2009).

A Flood Risk Assessment (FRA) was undertaken by Waterman Moylan on behalf of Raheny 3 Limited Partnership for the Proposed Development. This assessment identifies the risk of flooding at the Site from various sources and sets out possible mitigation measures against the potential risks of flooding. Sources of possible flooding include coastal, fluvial, pluvial (direct heavy rain), groundwater and human/mechanical errors. This report provides an assessment of the subject Site for flood risk purposes only.

The subject lands have been analysed for risks from tidal flooding from the Irish Sea, fluvial flooding from the Naniken River and the Santry River, pluvial flooding, ground water, and failures of mechanical systems. The following table presents the various residual flood risks involved:

Table 8-18: Residual Flood Risks (Source: Flood Risk Assessment)

Source	Pathway	Receptor	Likelihood	Consequence	Risk	Mitigation Measure	Residual Risk
Tidal	Dublin Bay, west of North Bull Island	Proposed Development	Extremely low	None	Negligible	None	Extremely low
Fluvial	Naniken and Santry Rivers	Proposed Development	Extremely low	None	Negligible	None	Extremely low
Pluvial	Private & Public Drainage Network	Proposed Development, downstream properties and roads	Ranges from low to high	High	Ranges from moderate to extremely high	Appropriate drainage, SuDS and attenuation design, setting of floor levels, overland flood routing	Low
Ground Water	Ground	Underground services, ground and basement levels of buildings	Low	Moderate	Low	Appropriate setting of floor levels, flood routing, damp proof membranes	Low
Human/Mechanical Error	Drainage network	Proposed Development	High	Moderate	High	Setting of floor levels, overland flood routing, regular inspection of SW network	Low

As indicated in Table 8-18, the various sources of flooding have been reviewed, and the risk of flooding from each source has been assessed. Where necessary, mitigation measures have been proposed. As a result of the proposed mitigation measures, the residual risk of flooding from any source is low. The full FRA Report can be found in Appendix L.

8.5.2.2.3 GHG Emissions

8.5.2.2.3.1 Traffic

Increased LDV and HGV traffic flow as a result of the Proposed Development is likely to contribute to increases in GHG emissions such as CO₂ and N₂O. However, these contributions are likely to be marginal in terms of overall national GHG emission estimates and Ireland's obligations under the Kyoto Protocol and the Paris Agreement, and therefore unlikely to have an adverse effect on climate. Furthermore, it is widely anticipated that CO₂ emissions for the passenger car fleet will reduce substantially in future years due to the increasing prevalence of electric or hybrid vehicle use.

8.5.2.2.3.2 Building Energy

An Energy Analysis Report has been prepared by IN2 Engineering Design Partnership on behalf of Raheny 3 Limited Partnership for the Proposed Development (August 2022). This report outlines the current building regulations framework and the requirement to achieve Nearly Zero-Energy Buildings (NZEB) standard for all new developments. The report describes how the NZEB standard is demonstrated using SEAI approved Dwelling Energy Assessment Procedure (DEAP) software.

Building energy has been long understood as contributing a major component of GHG emissions which was acknowledged within the 2030 Communication published by the European Commission (2014) which stated that “the majority of the energy-saving potential (for the EU) is in the building sector. The EU Energy Performance of Buildings Directive set out the target that all new developments should be Nearly Zero-Energy Buildings (NZEB) by the end of 2020.

For new dwellings in Ireland, NZEB has been defined as being (primarily) associated with demonstrating the following characteristics are achieved:

- Primary Energy / Carbon Emissions: 70% reduction against Part L 2005
- Renewable Energy: 20% of this Primary Energy required.

Energy analysis has been undertaken to demonstrate compliance to Building Regulations Technical Guidance Document (TGD) Part L 2019. The Energy Analysis Report outlines the requirements to ensure compliance, outlining the overarching EU Directive for NZEB. The DEAP Software was used to undertake energy analysis for Part L and BER for the development. This report details the assumptions made in terms of Building Construction, Mechanical and Electrical Systems and Renewable Technologies and subsequently confirms compliance of the Proposed Development in terms of Primary Energy, Carbon Emissions, and Renewable Energy Ratio. The analysis has determined that through a number of energy and servicing strategies, an A2/A3 BER should be attainable (IN2 Engineering Design Partnership, August 2022).

8.5.3 Potential Cumulative Impacts

Cumulative Impacts can be defined as “*impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project*”. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

Cumulative air quality impacts have the potential to arise locally when construction activities associated with the Proposed Development take place at the same time as other developments in a specific location. The cumulative effects on the air quality and climate of the current Proposed Development and other planned or existing developments have been considered, in particular through the generation of air pollutants and GHG emissions.

All planning applications which have been granted permission and are already developed have been incorporated into the baseline assessment of this application. A planning search has revealed that there have been a number of planning applications in the vicinity of the Proposed Development Site which have been granted permission, that could potentially be constructed at the same time as the Proposed Development. Table 8-19 details the planning applications in the surrounding area.

Table 8-19: Recent applications granted permission in the vicinity of the Proposed Development

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment
<p>2857/18</p> <p>Decision: Grant Permission. Decision Date: 19/12/2018</p>	<p>MKN Developments Limited</p>	<p>Amendments to the permitted development (Reg. Ref. 4242/15; ABP Ref. PL29N.246250 and as amended by Reg. Ref. 2977/17, ABP Ref. PL29N.249043) at this 0.53 hectares site at Sybil Hill Road, Raheny Dublin 5. The site is bounded by St. Pauls School to the south, Sybil Hill Road to the west, The Meadows residential development to the east and north and the Kare Social Services Centre to the north. The site formerly incorporated No. 1, 1A and 1B Sybil Hill Road (and lands to the rear of same).</p> <p>The proposed amendments consist of:</p> <ul style="list-style-type: none"> - The provision of an additional penthouse unit to Block A at 5th floor level and the extension of the 4th floor level to provide for 2 no. additional units (1 no. 3 bed unit and 1 no. 4 bed unit) to Block A increasing the unit number from 49 no. to 51 no. in Block A and from 76 no. to 78 no. overall (71 no. apartments and 7 no. houses); - The proposed additional units will result in a part increase in height of Block A at the southwestern corner fronting Sybil Hill Road from 16.1m to 19.25m; - The proposed extension to the 4th floor level to provide for 1 no. 3 bed units will be set back c. 5.6m from the western boundary along Sybil Hill Road with the penthouse unit at the new 5th floor level being set back c.2.5m from the western boundary with Sybil Hill Road. - Amendments to communal open space at 4th floor level to accommodate the additional residential units; - Minor elevational changes to Block A including the provision of private roof terraces at 4th and 5th floor level; - SUDs drainage and all ancillary and associated site development and landscaping works. 	<p>The Planning Authority (DCC) granted permission for the development subject to 11 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, traffic management and waste management. Specific conditions have been set by the Drainage Division regarding surface and foul water sewers and SuDS measures, which must be strictly adhered to. Therefore, there are no cumulative impacts anticipated with this development.</p>
<p>3167/19</p> <p>Decision: Grant Permission. Decision Date: 09/09/2019</p>	<p>Sean Carroll Garages Ltd.</p>	<p>Planning permission for development approved under Dublin City Council Reg. Ref. 4353/16 at the existing petrol filling station consisting of revisions to existing shop and forecourt including: (i) Change of use and internal alterations to ground floor to provide additional retail floorspace of 8 sq.m and ancillary facility for sales of hot food for consumption off the premises, (ii) New ground floor window and pay hatch to front elevation, (iii) Revisions to car parking layout, and (iv) all associated site, drainage and boundary development works.</p>	<p>The Planning Authority (DCC) granted permission for the development subject to 8 no. condition(s). The conditions relate to the sale of hot food, visual amenity, noise control, and traffic safety. Therefore, there are no cumulative impacts anticipated with this development.</p>
<p>3047/21</p> <p>Decision: Grant Permission.</p>	<p>The Board of Management of Greenlanes</p>	<p>Planning permission for the construction of a single storey extension to the rear of the existing school at the northwestern side of the site and including all associated site works.</p>	<p>The Planning Authority (DCC) granted permission for the development</p>

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment
<p>Decision Date: 01 Oct 2021</p>	<p>National School</p>		<p>subject to 8 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, transport and parking. Conditions have been set by the Drainage Division regarding surface and foul water sewers and SuDS measures, which must be strictly adhered to. Therefore, there are no cumulative impacts anticipated with this development.</p>
<p>2998/20 Decision: Grant Permission. Decision Date: 19 Oct 2020</p>	<p>St. Paul's College, Raheny</p>	<p>The development will consist of the following: construction of (i) a pergola structure consisting of a timber frame with retractable awning system above; (ii) sand and cement rendered block walls (0.8 m in height) with precast concrete capping to surround the proposed pergola structure; (iii) raised planted bedding along the block walls; and (iv) all site works necessary to facilitate the development. The proposed structure is located within the internal courtyard area at St. Paul's College.</p>	<p>The Planning Authority (DCC) granted permission for the development subject to 6 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, transport and drainage. Therefore, there are no cumulative impacts anticipated with this development.</p>
<p>3803/21 Decision: Grant Permission. Decision Date: 17 Feb 2022</p>	<p>The Society of Jesus</p>	<p>PROTECTED STRUCTURE: Permission for development at this site, which contains a Protected Structure known as Manresa House. The proposed development will consist of:</p> <ol style="list-style-type: none"> 1) a new single storey, flat-roofed building located to the northeast of the protected structure, to provide for new reception, dining, cooking and associated ancillary spaces, with rooflights, solar panels and part sedum roof; 2) a new single-storey, flat-roofed open loggia structure forming a covered route from the existing Retreat Building to the proposed new building; 3) associated hard landscaping, including new terrace and external steps, 2no. disabled parking bays, and extensive planting works to the courtyard; 4) landscaping works, including the provision of 36 no. car-parking spaces, new planting to the west lawn and the formation of a new stormwater attenuation pond; and 5) the removal of an existing single-storey, pitched roof timber structure. 	<p>The Planning Authority (DCC) granted permission for the development subject to 12 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, surface water drainage and SuDS, transport, parking and maintaining the integrity of the protected structure. Therefore, there are no cumulative impacts anticipated with this development.</p>

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment
<p>2038/18 Decision: Grant Permission. Decision Date: 08 Jan 2019</p>	<p>MKN Property Group</p>	<p>PROTECTED STRUCTURE: Permission for a residential development of 72 no. units across 4 no. blocks with a single level basement, consisting of the change of use of the existing Verville Retreat building from nursing home use to residential use and the change of use of the existing former outbuilding to residential use. The overall development will comprise of the following: Block A: construction of a 4 storey building (3 storeys with a setback fourth storey) comprising 14 no. apartments (12 no. 2 bedroom units and 2 no. 3 bedroom units) with balconies/terraces to the north and south elevations; Block B: The change of use of the existing 4 storey Verville Retreat building from nursing home use to residential use comprising 9 no. apartments (3 no. 1 bedroom units and 6 no. 2 bedroom units). Demolition of later additions and extensions to the existing Verville Retreat building as well as associated modifications to elevations and internal modifications/reconfiguration of the refurbishments to the existing building in order to accommodate the provision of the new apartment units and the construction of a new external stair core at the buildings eastern elevation; Block C: Construction of a 4 storey building (3 storeys with a setback fourth storey) comprising 48 no. apartments (1 no. studio apartment, 20 no. 1 bedroom units, 21 no. 2 bedroom apartments and 6 no. 3 bedroom apartments) with balconies/terraces to all elevations and roof garden; Block D: The conversion of the existing single storey outbuilding into 1 no. single storey, 2 bedroom mews dwelling with associated internal and external modifications to accommodate the proposed change of use; A basement level comprising a total of 69 no car parking spaces, 80 no. bicycle parking spaces, ancillary plant room and refuse storage areas; Revisions and improvements to the existing vehicular entrance to Vernon Avenue; Demolition of the existing single storey block to the north of Verville Retreat; landscaping (including communal and private open space); Boundary treatment; and, all associated engineering and site development works necessary to facilitate the development.</p>	<p>The Planning Authority (DCC) granted Retention Permission under planning ref. no. 3081/20 on 28 Oct 2020. The development is subject to the conditions of the original planning grant, with additional conditions relating to drainage. Therefore, there are no cumulative impacts anticipated with this development.</p>
<p>4656/18 Decision: Grant Permission. Decision Date: 27 Mar 2019</p>	<p>Clontarf Hospital</p>	<p>Permission for development at Castle Avenue, Clontarf, Dublin 3. The development will consist of the removal of the existing maintenance portacabins and demolition of the existing hard standing area, removal of 4 young trees which will be replaced in the area to suit the development, removal of 3 car spaces and the construction of a single storey maintenance building including, workshop, office, store and bin store and associated site works adjacent to the existing services yard.</p>	<p>The Planning Authority (DCC) granted permission for the development subject to 12 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, surface water drainage and SuDS, public infrastructure, public health and safety, amenity, ecology and</p>

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment
			sustainable development. Therefore, there are no cumulative impacts anticipated with this development.

The cumulative effects on the air quality and climate of the current Proposed Development and other permitted or existing developments have been considered, in particular through the generation of air pollutants and GHG emissions. The potential impacts on air quality and climate are assessed in Section 8.1.5 and it is considered that there are no other potential significant cumulative impacts associated with the Proposed Development and considered offsite permitted developments.

In terms of dust, no significant impacts are predicted; good construction practice, which incorporates the implementation of the identified mitigation measures, will be employed at the Proposed Development site. Due to the implementation of good construction practices at the Site of the Proposed Development and these offsite permitted developments, it is not anticipated that significant cumulative impacts will occur.

Assessment of operational stage impacts on air quality involved traffic data which is inclusive of traffic associated with other existing and permitted developments on the road networks surrounding the Site both in current and future years. Therefore, cumulative impacts have been assessed in this regard and the impact on ambient air quality has been determined as insignificant.

8.5.4 ‘Do Nothing’ Impact

The Do-Nothing impact has been assessed in terms of air quality in this chapter. It has been determined that there is an overall negligible increase in relevant pollutants as a result of the Proposed Development in both the Opening and Design Years when compared to the Do-Nothing scenario. Greenhouse gas emissions as a result of the Proposed Development are also likely to be marginal in terms of overall national GHG emission estimates and Ireland’s obligations under the Kyoto Protocol when compared to a Do-Nothing scenario.

8.6 Avoidance, Remedial & Mitigation Measures

8.6.1 Air Quality

8.6.1.1 Construction Phase

It is not expected that adverse air quality impacts are likely to occur at sensitive receptors as a result of the Proposed Development. However, appropriate mitigation measures, as outlined within the Construction, Environmental Management Plan (CEMP), will be employed as necessary to further prevent such impacts occurring:

- The roads in the vicinity of the site are all surfaced and no dust is anticipated arising from unsealed surfaces outside the site;

- A regime of 'wet' road sweeping can be set up to ensure the roads around the immediate Site are as clean and free from dirt / dust arising from the site, as is reasonably practicable. This cleaning will be carried out by approved mechanical sweepers;
- Footpaths immediately around the site can be cleaned by hand regularly, with damping as necessary;
- Vehicle waiting areas or hard standings can be regularly inspected and kept clean by brushing or vacuum sweeping and will be regularly sprayed to keep moist, if necessary;
- Vehicle and wheel washing facilities can be provided at Site exit(s) where practicable. If necessary, vehicles can be washed down before exiting the Site;
- Netting can be provided to enclose scaffolding in order to mitigate escape of air borne dust from the existing and new buildings;
- Vehicles and equipment will not emit black smoke from exhaust system, except during ignition at start up;
- Engines and exhaust systems will be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation;
- Servicing of vehicles and plant will be carried out regularly, rather than just following breakdowns;
- Internal combustion plant will not be left running unnecessarily;
- Where possible, fixed plant such as generators should be located away from residential areas;
- The number of handling operations for materials will be kept to a minimum in order to ensure that dusty material is not moved or handled unnecessarily;
- The transport of dusty materials and aggregates should be carried out using covered / sheeted lorries;
- Material handling areas should be clean, tidy and free from dust;
- Vehicle loading should be dampened down and drop heights for material to be kept to a minimum;
- Drop heights for chutes / skips should be kept to a minimum;

- Dust dispersal over the Site boundary should be minimised using static sprinklers or other watering methods as necessary;
- Stockpiles of materials will be kept to a minimum and they will be kept away from sensitive receptors such as residential areas etc;
- Stockpiles where necessary, will be sheeted or watered down;
- Methods and equipment will be in place for immediate clean-up of spillages of dusty material;
- No burning of materials will be permitted on Site;
- Earthworks excavations will be kept damp where necessary and where reasonably practicable;
- Cutting on site will be avoided where possible by using pre-fabrication methods;
- Equipment and techniques for cutting / grinding / drilling / sawing / sanding etc., which minimise dust emissions and which have the best available dust suppression measures, should be employed;
- Where scabbling is to be employed, tools should be fitted with dust bags, residual dust will be vacuumed up rather than swept away, and areas to be scabbled should be screened off;
- Wet processes will be used to clean building facades, if possible. If dry grit blasting is unavoidable then ensure areas of work are sealed off and dust extraction systems used;
- Pre-mixed plasters and masonry compounds should be used to minimise dust arising from on-site mixing;
- Prior to commencement, the Main Contractor will identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions. Furthermore, the Main Contractor will prepare environmental risk assessments for all dust generating processes, which are envisaged;
- The Main Contractor will allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.

8.6.1.2 Operational Phase

It has been determined that the Operational Phase air quality impact is negligible and therefore no site-specific mitigation measures are proposed.

8.6.2 Climate

As negative climatic impacts associated with the Construction and Operational Phases of the Proposed Development are negligible, no mitigation measures are proposed. Best practice measures will be implemented to minimise exhaust emissions from construction and operational vehicles and machinery by avoidance of engines running unnecessarily, as idle engines will not be permitted for excessive periods. Furthermore, all proposals for development will seek to achieve the greatest standards of sustainable construction and design and will have regard to sustainable building design criteria.

8.6.3 “Worst Case” Scenario

A worst-case scenario has been applied to the Construction Phase air quality assessment in terms of the scale of the source and potential dust nuisances. It is expected that adequate mitigation measures, as outlined in Section 8.6.1.1, will assist in preventing nuisance dust from resulting in any significant effects. In the event of a failure of such measures, it is not considered that significant dust related effects will occur.

A worst-case scenario has been applied to the Operational Phase air quality assessment in terms of traffic volumes experienced on the surrounding road network. Associated impacts have been determined as insignificant in this case.

8.7 Residual Impacts

Residual Impacts are defined as *‘effects that are predicted to remain after all assessments and mitigation measures’*. They are the remaining ‘environmental costs’ of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

The Proposed Development is likely to result in a long-term increase in traffic on the roads surrounding the Proposed Development Site; however, this increase in traffic has been determined to have negligible impacts in terms of local air quality. Furthermore, the increase in traffic has been determined as marginal with regard to climatic impacts. Therefore, no significant residual impacts are anticipated from the proposed scheme in the context of air quality and climate after the application.

8.8 Monitoring

The monitoring of construction dust during the Construction Phase of the Proposed Development is recommended to ensure that impacts are not experienced beyond the Site boundary. Monitoring of dust can be carried out by using the Bergerhoff Method. This involves placing Bergerhoff Dust Deposit Gauges at strategic locations along the Site boundaries for a period of 30 +/- 2 days. The selection of sampling point locations should be carried out in consideration of the requirements of *VDI 2119* with respect to the location of the samplers relative to buildings and other obstructions, height above ground, and sample collection and analysis procedures. After the exposure period is complete, the Gauges should be removed from the Site; the dust deposits in each Gauge will then be determined gravimetrically and expressed as a dust deposition rate in $\text{mg}/\text{m}^2/\text{day}$ in accordance with the relevant standard.

Due to the negligible impact on air quality and climate from the Operational Phase of the Proposed Development, no specific monitoring is recommended.

8.9 Interactions

Interactions between Air Quality and Climate and other aspects of this Environmental Impact Assessment Report have been considered and are detailed below.

8.9.1 Population and Human Health

Interactions between Air Quality and Population and Human Health have been considered as the Operational Phase has the potential to cause health issues as a result of impacts on air quality from dust nuisances and potential traffic derived pollutants. However, the mitigation measures employed at the Proposed Development will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected. Furthermore, traffic-related pollutants have been assessed and determined as negligible, therefore air quality impacts from the Proposed Development are not expected to have a significant impact on population and human health.

8.9.2 Biodiversity

Designated sites of ecological conservation importance within 200m of the Affected Road Network (ARN) are required to be included in the air quality assessment. This includes special protection areas, special areas of conservation, natural heritage areas, and nature reserves. Only sites that are sensitive to nitrogen deposition should be included in the assessment, it is not necessary to include sites such as those which have been designated as a geological feature or water course. No Sites of ecological conservation importance have been identified within 200m of the ARN; therefore, this analysis has been excluded in the current assessment and significant effects are not expected to occur. Therefore, the impact of the interaction between air quality and climate and biodiversity is insignificant.

8.9.3 Land and Soil

There is the potential for dust from soil spillages on the existing road network around the site to impact air quality, especially during dry conditions. However, dampening down measures with water sprays will be implemented during period of dry weather to reduce dust levels arising from the development works. Therefore, the impact of the interaction between air quality and climate and biodiversity is insignificant.

8.9.4 Traffic

There can be a significant interaction between air quality, climate and traffic. This is due to traffic-related pollutants that may arise. In the current assessment, traffic derived pollutants which may affect Air Quality and Climate have been deemed as negligible. Therefore, the impact of the interaction between air quality and climate is insignificant.

8.10 Difficulties Encountered When Compiling

No difficulties have been encountered while compiling this chapter.

8.11 References

- Air Pollution Act 2012 (S.I. No. 326 of 2012) Irish Statute Book.
- Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) Irish Statute Book.
- Air Quality, Clean Air for Europe Directive (2008/50/EC) EUR-Lex.
- Department of Communications, Climate Action and Environment (DCCAE) (2017) National Mitigation Plan
- Department of Communications, Climate Action and Environment (DCCAE) (2018) National Adaptation Framework
- Department of the Environment, Transport and the Regions, 1995. The Environmental Effects of Dust from Surface Mineral Workings- Volume 2. Technical Report.
- Environmental Protection Agency (2018) Ireland's Final Greenhouse Gas Emissions 1990-2016.
- Environmental Protection Agency (2019) Ireland's Final Greenhouse Gas Emissions 1990-2017.
- Environmental Protection Agency (2019) Irelands National Inventory Report: Greenhouse Gas Emissions 1990-2017.
- Environmental Protection Agency (2019) Irelands Provisional Greenhouse Gas Emissions 1990-2018.
- Environmental Protection Agency (2020) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4).
- Environmental Protection Agency (2020) Air Quality in Ireland 2019 Annual Report on Air Quality in Ireland from the Environmental Protection Agency.
- Environmental Protection Agency (2021) Air Quality in Ireland 2020 Annual Report on Air Quality in Ireland from the Environmental Protection Agency.
- European Commission (2007) 2020 Climate & Energy Package.
- European Commission (2011) A Roadmap for Moving to a Competitive Low Carbon Economy in 2050.
- European Commission (2014) 2030 Climate & Energy Framework.
- German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft.
- Government of Ireland (2015) Climate Action and Low Carbon Development Act.
- Government of Ireland (2019) Climate Action Plan 2019.
- Institute of Air Quality Management (2014) Guidance on the Assessment of Dust from Demolition and Construction.
- Institute of Air Quality Management (2016) Guidance on the Assessment of Mineral Dust Impacts for Planning.
- Institute of Air Quality Management (2017) Land-Use Planning & Development Control: Planning for Air Quality.

Intergovernmental Panel on Climate Change (2006) IPCC Guidelines for National Greenhouse Gas Inventories.

Intergovernmental Panel on Climate Change (2019) Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Met Eireann (2021) Daily Meteorological Data for Dublin Airport Synoptic Weather Station.

Met Eireann (2021) Hourly Meteorological Data for Dublin Airport Synoptic Weather Station.

Met Eireann (2021) Monthly Meteorological Data for Dublin Airport Synoptic Weather Station.

Transport Infrastructure Ireland (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes.

UK Department for Environment, Food and Rural Affairs (2020) NO_x to NO₂ Conversion Spreadsheet (Version 8.1).

UK Department for Environment, Food and Rural Affairs (2008) Analysis of the relationship between annual mean nitrogen dioxide concentration and exceedances of the 1-hour mean AQS Objective.

UK Highways Agency (2019) UK Design Manual for Roads and Bridges (DMRB), Volume 11, Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 LA 105 Air Quality.

United Nations Framework Convention on Climate Change (1998) Kyoto Protocol to the UNFCCC.

United Nations Framework Convention on Climate Change (2012) The Doha Amendment to the Kyoto Protocol.

United Nations Framework Convention on Climate Change (2015) The Paris Agreement.

9 NOISE & VIBRATION

9.1 Introduction

This Chapter of the EIAR identifies, describes and assesses the likely impact of the Proposed Development on lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5 regarding noise.

This Chapter describes and assesses the likely direct and indirect significant effects of the Proposed Development on nearby sensitive receptors, the existing ambient noise environment and the mitigation measures that will be introduced to reduce or eliminate any potential impact

Amplitude Acoustics have been engaged as Acoustic Consultants for the Proposed Development. As part of the post planning preconstruction acoustic design, Amplitude will be undertaking site measurements, an inward noise impact assessment, operational noise assessment and construction noise and vibration assessment. A letter of confirmation is provided by Amplitude Acoustics and can be found in Appendix C. A request for further information (FI) is expected. The assessments detailed above will be conducted once an FI is issued.

9.1.1 Competence

The chapter was prepared by Laura Griffin, Environmental Consultant, Enviroguide Consulting. Laura has a Master of Science (Hons) in Climate Change from Maynooth University and a Bachelor of Arts (Hons) in English and Geography from Maynooth University. Laura has experience working on a number of EIARs and EIA Screening Reports for projects of a similar scale to the Proposed Development.

9.2 Noise

Noise is defined as any sound that has the potential to cause disturbance, discomfort, or psychological stress to a person exposed to it, or any sound that could cause actual physiological harm to a person exposed to it, or physical damage to any structure exposed to it. In summary, noise can be defined as any unwanted sound. Sound levels are expressed in decibels (dB) on a logarithmic scale, where 0dB is nominally the "threshold of hearing" and 120dB is nominally the "threshold of pain" (refer to Figure 9-1).

Background noise is defined as '*the steady existing noise level present without contribution from any intermittent sources. The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T (LAF90, T)*'. According to the EPA Noise Guidance NG4, an area of low background noise is one where the existing background noise levels measured during an environmental noise survey are as follows:

- Average Daytime Background Noise Level ≤ 40 dB LAF90, and;
- Average Evening Background Noise Level ≤ 35 dB LAF90, and;
- Average Night-time Background Noise Level ≤ 30 dB LAF90.

The Proposed Development, though situated in a suburban, is considered to be a non-quiet area as per EPA screening guidelines.

Figure 9-1 depicts typical sounds and their noise levels on a decibel scale.

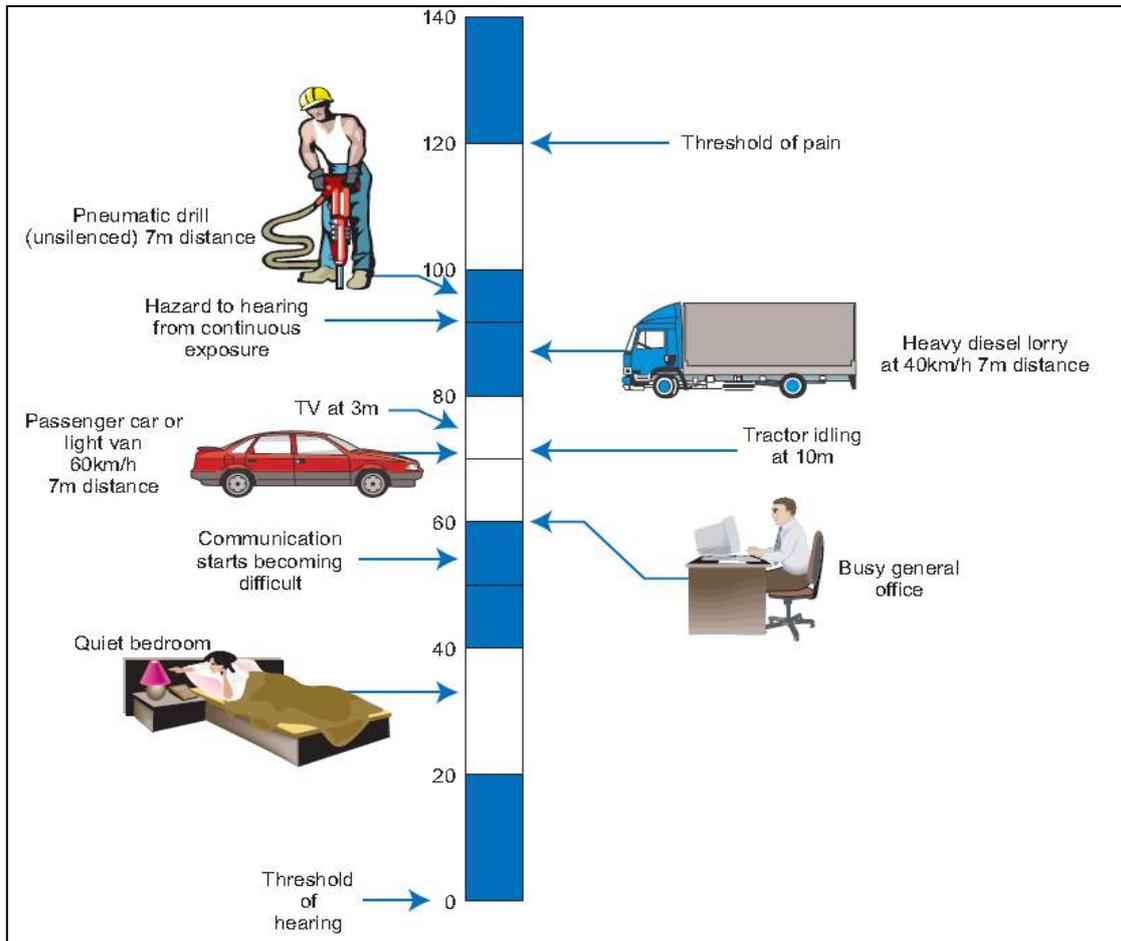


Figure 9-1: Scale and Indicative Noise Levels on the dB(A) Scale (Based on guidance taken from: Design Manual for Roads and Bridges, Volume 11 Consolidated Edition 1993)

Table 9-1: Glossary of Acoustic Terminology

Ambient noise	The totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far.
Background noise	The steady existing noise level present without contribution from any intermittent sources. The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T ($L_{AF90,T}$).
dB	Decibel – The scale in which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the RMS pressure of the sound field and the reference pressure of 20 micro-pascals (20 μ Pa).
dB(A)	An 'A-weighted decibel' – a measure of the overall noise level of sound across the audible frequency range (20 Hz – 20 kHz) with A-frequency weighting (i.e. 'A' weighting) to compensate for varying sensitivity of the human ear to sound at different frequencies.

9.3 Study Methodology

This assessment will examine the likely impacts of sound pressure levels generated by the Proposed Development located on lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5. Noise calculations will be used to predict and assess the likely impact of onsite equipment at offsite noise sensitive receptors.

For the purpose of the assessment, 'sensitive receptors' terminology used describes any persons, locations or otherwise that may be susceptible to changes as a consequence of the Proposed Development.

The primary noise impacts associated with this Proposed Development are likely to be due to:

- Site clearance, including demolition works of the pre-fab building within the grounds;
- Building construction works;
- Trucks entering and exiting the Site.

With respect to the listed noise impacts, the key objective of the Proposed Development is to manage activities to ensure any significant increase in noise emissions are minimised.

The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out in this section of the Chapter.

The assessment has been undertaken using the following methodology:

- An evaluation of the Site and its environs to assess certain changes to noise that are likely to impact the surrounding environs (See Figure 9-2). The study area was chosen based on the identification of sensitive receptors within a close proximity to the Proposed Development.
- Identification of sensitive receptors for a complete list of the sensitive receptors identified as part of this assessment, see Section 9.5.1.
- A review of the most applicable standards and guidelines has been reviewed in order to set a range of acceptable noise and vibration criteria for the Construction Phase of the Proposed Development.
- Predictive calculations relating to potential Construction Phase impacts have been undertaken at the identified noise sensitive locations in Figure 9-3.
- BS 5228 2009 +A1 2014 Code of practice for noise and vibration control on construction and open sites with respect to the controlling noise and vibration impacts.



Figure 9-2: Study Area

Documents consulted during the preparation of this EIAR chapter are listed in the References section. The acoustics section has been compiled taking cognisance of:

- Design Manual for Roads and Bridges Volume 11 Section 3 Part 7 (HD 213/11 – Revision 1) (The Highways Agency et al., 2011);
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise;
- ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures
- ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels;
- ISO 9613-1:1993 Acoustics - Attenuation of sound during propagation outdoors -- Part 1: Calculation of the absorption of sound by the atmosphere;
- ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors -- Part 2: General method of calculation;
- Environmental Protection Agency (2016) Guidance Note for Noise (NG4): Licence Applications, Surveys and Assessments in Relation to Scheduled Activities; and
- Guidelines for the Treatment of Noise & Vibration in National Road Schemes, National Roads Authority, Revision 1, 25th October 2004.

The following noise indices, analysis and observations were reviewed. This noise criteria informs the noise analysis.

- LA_{eq} - The A-weighted, equivalent continuous sound level of the measurement period. Represents an 'energy average' of the sound pressure levels measured.
- LA_{90} – The A-weighted, noise level exceeded for 90% of the measurement period. Calculated by statistical analysis of the measurement data.
- LA_{10} - The A-weighted, noise level exceeded for 10% of the measurement period. Calculated by statistical analysis of the measurement data.
- LAS_{max} - The maximum level with A-weighted frequency response and Slow time constant.

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the quality of effects. See Table 9-2.

Table 9-2: Definition of Quality of Effects

Quality	Definition
Positive Effects	A change which improves the quality of the environment
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

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the significance of impacts. See Table 9-3.

Table 9-3: Definition of Significance of Effects

Significance of Effects	Definition
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	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

In line with the EPA Guidelines (EPA, 2017), the following terms are defined when quantifying duration and frequency of effects. See Table 9-4.

Table 9-4: Definition of Duration of Effects

Quality	Definition
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

9.3.1 Guidance, Policy and Legislation

The guidance, policy and legislation consulted during the preparation of this EIAR were as follows:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA May 2022);
- Dublin Local Authorities including: Dublin City Council (DCC), Fingal County Council (FCC), South Dublin County Council (SDCC) and Dún Laoghaire Rathdown County Council (DLRCC);
- Dublin Agglomeration Third Environmental Noise Action Plan December 2018-2023;
- European Communities (EC) (Environmental Noise) Regulations 2018 (S.I. No. 549/2018);
- EC Noise Emission by Equipment for Use Outdoors (Amendment) Regulations (S.I. No. 241/2006);

9.4 The Existing and Receiving Environment (Baseline Situation)

Raheny 3 Limited Partnership are applying for permission for development on lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5. The site is bound to the north, east and south by St Anne's Park and to the west by residential development at The Meadows, Sybil Hill House (a Protected Structure) and St Paul's College. Vehicular access to the site is from Sybil Hill Road.

9.4.1 Quiet Area Screening

Screening was carried out to identify the potential of the Proposed Development located in or near an area that could be considered a 'Quiet Area' in open country in accordance with the Environmental Protection Agency's publication "Environmental Quality Objectives – Noise in Quiet Areas, 2003.

The criteria used to assess this determination comprised of the following

- At least 3 km from urban areas with a population >1,000 people;
- At least 10 km from any urban areas with a population >5,000 people;
- At least 15 km from any urban areas with a population >10,000 people;
- At least 3 km from any local industry;
- At least 10 km from any major industry centre;
- At least 5 km from any National Primary Route, and;
- At least 7.5 km from any Motorway or Dual Carriageway.

If the Site does not meet the listed criteria, it is considered to be a non-quiet area as per the definition of the Environmental Protection Agency. 'Quiet Areas', according to NG4 (2016). Before relevant noise criterion can be applied, 'Quiet Area Screening' must be performed to identify or rule out the Site as a Quiet Area. Quiet Area screening results can be viewed in Table 9-5.

Table 9-5: Quiet Area Screening of the Development Location

Quiet Area Screening of the Development Location			
Screening Question	Answer (Yes/No)		Screening Results
Is the site >3km away from urban areas with a population >1,000 people?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	The Proposed Development is located within 3km of Raheny which is an area with a population >1,000 people.
Is the site >10km away from urban areas with a population >5,000 people?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	The Proposed Development is located within 10km of Raheny which has a population >5,000 people.
Is the site >15km away from urban areas with a population >10,000 people?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	The Proposed Development is located within 15km of Raheny which has a population of over 18,000 people.
Is the site >3km away from any local industry?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	The Proposed Development is located within 3km of local industry.
Is the site >10km away from any major industry center?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	The Proposed Development is located within 10km of a major industry center.
Is the site >5km away from any national primary route?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	The N1 is located 3.7km to the west of the Proposed Development.
Is the site >7.5km away from any motorway or dual carriageway?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	The M50 is located 3.5km west of the Proposed Development.
QUIET AREA?	No		The Site does not meet these criteria it is not considered to be a quiet area.

According to the EPA Guidance, *NG4*, where an area is determined not to be a 'quiet area', baseline monitoring should be conducted to determine if there is a low background noise. As the Proposed Development is located in an area which does not meet the criteria as per EPA screening guidelines, a low background noise would not be predicted. As such, baseline noise monitoring for the Site is recommended.

9.4.2 Recommended Noise Limits

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the Construction Phase of a project. Dublin City County Council (DCC) does however impose the following limits in respect to construction hours of operation and consider noise limits at their discretion:

- 08:00 to 19:00hrs Monday to Friday, and:
- 08:00 to 14:00hrs Saturdays with no activities permitted on Sundays or Bank Holidays.

Whilst no specific construction noise limits are set by DCC with respect to noise, the Dublin Agglomeration Noise Action Plan 2013 to 2018 refers to the use of BS 5228 2009 +A1 2014 Code of practice for noise and vibration control on construction and open sites with respect to the control of noise and vibration impacts. In this instance, appropriate criteria relating to permissible construction noise levels are taken from BS 5228 – 1:2009+a1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*.

BS 5228 – 1:2009+a1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*. This document suggests an absolute construction noise limits depending on the receiving environment. The documents states:

“Noise from construction and demolition sites should not exceed the level at which conversations in the nearest building would be difficult with windows shut.... Noise levels between 07:00 and 19:00hrs, outside the nearest window of the occupied room closest to the site boundary should not exceed:

- 70dB in rural, suburban and urban areas away from main road traffic and industrial noise;
- 75dB in urban areas near main roads in heavy industrial areas.”

The Proposed Development is located in Raheny, a northern suburb of Dublin, centred between Dublin City Centre and Howth. Nearby areas include Killester, Clontarf, Artane, Kilbarrack, Coolock and Donaghmede. Given the suburban context, a limit value of 70dB LAeq,T for construction is considered to be reasonable.

This limit value is also in agreement with those set by Transport Infrastructure Ireland (TII) for construction projects. The 2004 TII document “*Guidelines for the Treatment of Noise and Vibration in National Road Schemes*” outlines the following construction noise limit values, as outlined in Table 9-6:

Table 9-6: Construction Noise Limits (Source: TII, 2004)

Days and Times	LAeq	LAsmax
Monday to Friday (07:00 to 19:00 hours)	70dB	80dB
Monday to Friday (07:00 to 20:00 hours)	60dB*	75dB*
Saturdays (08:00 to 16:30 hours)	65dB	75dB
Sundays & Bank Holidays (08:00 to 16:30 hours)	60dB*	65dB*

Note * Construction activity at these times, other than that required for emergency works, will normally require the explicit permission of the local authority.

9.4.3 Recommended Vibration Limits

In terms of vibration, British Standard BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration, recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15mm/s at 4Hz increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above. The standard also notes that below 12.5 mm/s PPV the risk of damage tends to zero. It is therefore common, on a cautious basis, to use this lower value. Taking this into consideration, the vibration criteria in Table 9-7 are recommended.

Table 9-7: Recommended Vibration Criteria During Construction Phase

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at the frequency of:		
Less than 15Hz	15 to 40Hz	40Hz and above
12 mm/s	20 mm/s	50 mm/s

9.5 Characteristics of the Proposed Development

The Proposed Development consists of the construction of a residential and nursing home development set out in 7 no. blocks, ranging in height from 4-7 storeys to accommodate 580 no. apartments, residential tenant amenity spaces, a crèche and a 100-bed nursing home. The site will accommodate car parking spaces, bicycle parking spaces, storage, services and plant areas at both basement and podium level.

Landscaping will include extensive communal amenity areas, and a significant public open space provision on the east and south of the site. The proposed application includes all site landscaping works, green roofs, substations, boundary treatments, lighting, servicing, signage, surface water attenuation facilities and associated and ancillary works, including site development works and services above and below ground. For a full description of the Proposed Development please refer to the Statutory Notices.

The Proposed Development is to be constructed in two stages which will include, in broad terms, the following:

- Stage I: Site demolition works, site clearance and preparation work for the construction. A site compound including offices and welfare facilities will be set up by the Main Contractor.
- Stage II: Site development and construction. The development includes all associated site works and infrastructure which includes roads, utilities, foul and surface water drainage.

When considering a development of this nature, the potential noise and vibration impact on the surroundings is considered for each of two distinct stages:

- Construction Phase; and
- Operational Phase.

The Construction Phase will generate the highest potential noise impact due to the works involved, however, the phase is short to medium term and expected to be completed within in the aforementioned Stage I and Stage II over 18 months.

The operational hours for the site will be 08:00 to 17:00 Mondays to Fridays and 08:00 to 14:00 Saturdays. No work is permitted on Sundays or public holidays. Deviation from these hours will only be allowed in exceptional circumstance with prior written approval from the planning authority.

9.6 Potential Impact of the Proposed Development

This section assesses the impact of the Proposed Development on the human environment. The noise-generating activities associated with the Site are as follows:

- Site clearance, including demolition works of the pre-fab building within the grounds;
- Building construction works;
- Trucks entering and exiting the Site – this will comprise of a mixture of Large Good Vehicles (LGVs) and Heavy Good Vehicles (HGVs) for deliveries and earthworks material haulage.

9.6.1 Noise Sensitive Locations

The EPA define noise sensitive locations as '*any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels*'.

In identifying sensitive receptors, consideration has been given residential properties or noise sensitive premises such as schools or hospitals, or recreational spaces within a close proximity of the Proposed Development. Identified noise sensitive locations (NSLs) in relation to the Proposed Development can be viewed in Figure 9-2. NSL 1 is St. Paul's school campus, NSL 2 are residential dwellings which are located within the Meadows' estate (there are approximately 29 houses in the estate) and NSL 3 is the Sacred Heart Residence. This has been assessed and discussed in further detail in Section 9.6.2.1. These NSLs have been chosen based on their proximity to the Site, NSLs which are at a further distance from the Proposed Development are at such distances where noise predictions from onsite plant and equipment fall below the threshold of 70dB(A).



Figure 9-3: Location of Noise Sensitive Locations in relation to Project Site

As shown in Figure 9-3, three NSLs have been identified in relation to the Proposed Development Site. The boundary of the closest NSL to the proposed construction activities is located at a distance of 40m from the activities and is identified as NSL 2 as per Figure 9-3. The closest NSL to the proposed demolition activities is located at a distance of 20m from the activities and is identified as NSL 1 as per Figure 9-3.

9.6.2 Construction Phase

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

9.6.2.1 Noise from Onsite Plant & Equipment

Noise and vibration can arise from vehicular traffic as well as from the operation of fixed or mobile machinery onsite. Onsite activity involves Site clearance and construction. A variety of plant items will be used for the purposes of Site clearance and construction.

Noise prediction calculations have been completed for noise from the use of onsite plant up to 250m from the source. Standard good practice measures for noise from construction sites will be included. There is no legal requirement regarding the distance of measurements from the source, 250m was selected based on the proximity of the Site to sensitive receptors.

Distances beyond 250m were not included as the dB(A)s at these distances are already significantly lower than the 70dB(A) threshold.

According to the inverse square law, for each doubling of distance from a point source, the sound pressure level decreases by approximately 6 dB. Therefore, for each doubling of distance from the source of noise, the sound will be 6dB less intense. The reference levels were calculated and projected for a range of distances from the source to the appropriate receptor using the following formula:

$$L_{\text{Source}} \approx L_{\text{Ref}} - 20 \cdot \text{Log}_{10}(R2/R1)$$

Where:

L_{Source} = Sound Pressure Level at Initial Location

L_{Ref} = Sound Pressure Level at the new Location

R1 = Distance from the noise source to initial location

R2 = Distance from noise source to the new location

The calculations make a number of assumptions such as:

1. There is a straight line between the source and observer.
2. Meteorological conditions are static.
3. There are no natural barriers that affect attenuation of noise other than distance.
4. All plant items are operating from a single source simultaneously and at full capacity.
5. All plant items are operating at the edge of the work area closest to the sensitive receptor.

The inverse square law is the logical first estimate of the sound you would get at a distant point in a reasonably open area. It is noted that the sound intensity from a point source will obey the inverse square law if there are no reflections or reverberation. If there are barriers between the source and the point of measurement, you are likely to get less than what the inverse square law predicts.

Table 9-8 and Table 9-9 set out the equipment associated with the Proposed Development and associated dB(A) levels according to BS 5228-1, and the inverse square law:

Table 9-8: Equipment associated with proposed construction activities

Plant Item	Ref	dB(A) @10m	dB(A) @-40m	dB(A) @100m	dB(A) @150m	dB(A) @200m	dB(A) @250m
Loading Shovel	BS 5228-1	76.5	64.5	56.5	53	50.5	48.5
Excavator	BS 5228-1	75	63	55	51.5	49	47
Mobile Crane	BS 5228-1	70	58	50	46.5	44	42
Generator	BS 5228-1	65	53	45	41.5	39	37
Dozer	BS 5228-1	81	69	61	57.5	55	53

Table 9-9: Equipment associated with proposed demolition activities

Plant Item	Ref	dB(A) @10m	dB(A) @-20m	dB(A) @70m	dB(A) @100m	dB(A) @200m	dB(A) @250m
Breaker	BS 5228-1	90	84	73.1	70	64	62
Crusher	BS 5228-1	86	80	69.1	66	60	58
Excavator	BS 5228-1	75	69	58.1	55	49	47

Table 9-8 and Table 9-9 outline the predicted noise levels at reference distances using *BS 5228-1* recommendations. The predicted noise levels from onsite activities up to 250m from the operational site have been included. The closest NSL to onsite construction activities is NSL 2, these are residential dwellings within the Meadows' estate which are located at distances approximately 40m from the construction activities. The predicted noise levels from all plant items are expected to fall below the noise limit of 70dB(A) at 40m for the Construction Phase; therefore, noise limit criteria will not be exceeded at or beyond this location, and sensitive receptors will not be affected.

The closest NSL to the demolition works are those within the school campus (NSL 1) which are approximately 20-30m from the closest works; and the closest residential dwellings (NSL 2) are some 70m from these works. There is potential for the adopted criteria to be exceeded during demolition works of the prefabs at St. Pauls College. In the event that demolition works are scheduled during normal school terms and during school hours, there is the potential for short-term intermittent significant impacts in the absence of mitigation measures. There is the potential for the adopted criteria to be exceeded during demolition works at the closest residential dwellings, however, there are hedgerows on the intervening lands between the demolition works and the residential dwellings. It is important to recognise that the sound intensity from a point source will obey the inverse square law if there are no reflections or reverberation. If there are barriers between the source and the point of measurement, you are likely to get less than what the inverse square law predicts. Therefore, when taking account of local terrain, predicted noise levels at the closest residential NSL are expected to be lower than what is outlined in Table 9-9. Furthermore, demolition works will take place over a limited

period and will be short in duration. Nevertheless, mitigation measures, as outlined in Section 9.7.1, will be implemented to reduce any potential impacts. NSL 3 the Sacred Heart Residence is located 100m from the proposed demolition works and the adopted criteria is not expected to be exceeded at this NSL.

9.6.3 Operational Phase

During the operational phase of the development, no significant sources of noise or vibration are expected with the development. The primary source of outward noise in the operational context relates to any changes in traffic flows along the local road network and any operational plant noise used to serve the ancillary elements within the apartment buildings, creche and nursing home.

Once the development is completed, the potential noise impacts to the surrounding environment are minimal. The residential aspect of the development is not expected to generate any significant noise sources over and above those which form part of the existing environment at neighbouring residential areas (estate vehicle movements, children playing etc.) and hence no significant impact are expected from this area of the development site.

The main potential noise impact associated with the Proposed Development is considered therefore to relate to the generation of additional traffic to and from the site as a result of the Proposed Development. Potential noise impacts also relate to operational plant serving the apartment buildings such as heat pumps.

Once operational, there are no vibration sources associated with the development site.

9.6.3.1 Noise from Operational Traffic

The traffic data used in this assessment has been provided by Waterman Moylan Engineering Consultants in Volume 2, Chapter 12 'Traffic'. The projected increase in traffic volume to be generated by the Proposed Development for Junction 1, 2, 3, 4 and 5 is as follows (the AM and PM Peak hours identified were 08:00-09:00 and 17:00-18:00 respectfully):

- The traffic volumes for Junction 1 (Sybil Hill Road (R808)/Howth Road (R105) are projected to increase by 2% for both the AM and the PM peak hour;
- Traffic volumes at Junction 2 (Sybil Hill Road (R808)/St. Pauls Access Road) are projected to increase by 8% for the AM peak hour and 9% for the PM peak hour;
- Traffic volumes at Junction 3 (Sybil Hill Road (R808)/Vernon Avenue) are projected to increase by 7% for the AM peak hour and 6% for the PM peak hour;
- Traffic volumes at Junction 4 (Vernon Avenue (R808)/Seafield Road W/Seafield Road E) are projected to increase by 3% for both the AM and PM peak hour;
- Traffic volumes at Junction 5 (Vernon Avenue (R808)/Clontarf Road (R807)) are projected to increase by 1% for both the AM and PM peak hour.
- Traffic volumes at Junction 6 (Sybil Hill Road (R808)/Sybil House Road (Site Access Road)) are projected to increase by 17% for the AM peak hour and 18% for the PM peak hour;

A desk-based assessment was carried out to determine the need for a noise and vibration impact assessment. The Design Manual for Roads and Bridges (DMRB) was used for this assessment, this Standard provides guidance on the assessment of impacts that road projects

may have on levels of noise and vibration. The following threshold from the Design Manual for Roads and Bridges (DMRB) has been imposed to qualify for an assessment of noise from traffic, Volume 11 Section 3 Part 7 (HD 213/11 – Revision 1) (The Highways Agency et al., 2011) states that *“changes in traffic volume on existing roads or new routes may cause either of the threshold values for noise to be exceeded. A change in noise level of 1dB LA10, 18h is equivalent to a 25% increase or a 20% decrease in traffic flow, assuming other factors remain unchanged and a change in noise level of 3dB LA10, 18h is equivalent to a 100% increase or a 50% decrease in traffic flow”*.

No traffic routes are predicted to experience increases of more than 25% in total traffic flows during the Operational Phase and therefore no detailed assessment is required as per the DMRB Guidelines. Refer to Chapter 12 of the EIAR for a detailed traffic assessment report.

The impact of noise from operational traffic will be unnoticeable and will not have a negative impact.

9.6.4 Potential Cumulative Impacts

Cumulative Impacts can be defined as *“impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”*. Effects which are caused by the interaction or combination effects, or by associated or off-site projects, which give rise to larger, more significant effects. Cumulative effects are often indirect, arising from the cumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

The cumulative effects of noise and vibrations from the Proposed Development and other existing developments have been considered, in particular through the generation of nuisance noise. All planning applications which have been granted permission and are already developed have been incorporated into the baseline assessment of this application. A planning search has revealed that there have been a number of planning applications in the vicinity of the Proposed Development Site which have been granted permission, that could potentially be constructed at the same time as the Proposed Development. Table 9-10 details the planning applications in the surrounding area.

Table 9-10: Recent applications in the vicinity of the Proposed Development

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment	Construction Status
<p>2857/18</p> <p>Decision: Grant Permission.</p> <p>Decision Date: 19/12/2018</p>	<p>MKN Developments Limited</p>	<p>Amendments to the permitted development (Reg. Ref. 4242/15; ABP Ref. PL29N.246250 and as amended by Reg. Ref. 2977/17, ABP Ref. PL29N.249043) at this 0.53 hectares site at Sybil Hill Road, Raheny Dublin 5. The site is bounded by St. Pauls School to the south, Sybil Hill Road to the west, The Meadows residential development to the east and north and the Kare Social Services Centre to the north. The site formerly incorporated No. 1, 1A and 1B Sybil Hill Road (and lands to the rear of same). The proposed amendments consist of:</p> <ul style="list-style-type: none"> - The provision of an additional penthouse unit to Block A at 5th floor level and the extension of the 4th floor level to provide for 2 no. additional units (1 no. 3 bed unit and 1 no. 4 bed unit) to Block A increasing the unit number from 49 no. to 51 no. in Block A and from 76 no. to 78 no. overall (71 no. apartments and 7 no. houses); - The proposed additional units will result in a part increase in height of Block A 	<p>The Planning Authority (DCC) granted permission for the development subject to 11 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, traffic management and waste management. Specific conditions have been set by the Drainage Division regarding surface and foul water sewers and SuDS measures, which must be strictly adhered to. Therefore, there are no cumulative impacts anticipated with this development.</p>	<p>Construction status unknown.</p> <p>A desk-based study was completed, satellite imagery of the reviewed. Construction works appear to be completed on-site since July 2019.</p>

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment	Construction Status
		<p>at the southwestern corner fronting Sybil Hill Road from 16.1m to 19.25m;</p> <ul style="list-style-type: none"> - The proposed extension to the 4th floor level to provide for 1 no. 3 bed units will be set back c. 5.6m from the western boundary along Sybil Hill Road with the penthouse unit at the new 5th floor level being set back c.2.5m from the western boundary with Sybil Hill Road. - Amendments to communal open space at 4th floor level to accommodate the additional residential units; - Minor elevational changes to Block A including the provision of private roof terraces at 4th and 5th floor level; - SUDs drainage and all ancillary and associated site development and landscaping works. 		
<p>3167/19</p> <p>Decision: Grant</p> <p>Permission.</p> <p>Decision Date:</p> <p>09/09/2019</p>	<p>Sean Carroll Garages Ltd.</p>	<p>Planning permission for development approved under Dublin City Council Reg. Ref. 4353/16 at the existing petrol filling station consisting of revisions to existing shop and forecourt including: (i) Change of use and internal alterations to ground floor to provide additional retail floorspace of 8 sq.m and ancillary facility for sales of hot food for</p>	<p>The Planning Authority (DCC) granted permission for the development subject to 8 no. condition(s). The conditions relate to the sale of hot food, visual amenity, noise control, and traffic safety. Therefore, there are no cumulative impacts anticipated with this development.</p>	<p>Construction status unknown.</p> <p>A desk-based study was completed, satellite imagery of the reviewed. Construction had not commenced by March 2022.</p>

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment	Construction Status
		consumption off the premises, (ii) New ground floor window and pay hatch to front elevation, (iii) Revisions to car parking layout, and (iv) all associated site, drainage and boundary development works.		
3047/21 Decision: Grant Permission. Decision Date: 01 Oct 2021	The Board of Management of Greenlanes National School	Planning permission for the construction of a single storey extension to the rear of the existing school at the northwestern side of the site and including all associated site works.	The Planning Authority (DCC) granted permission for the development subject to 8 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, transport and parking. Conditions have been set by the Drainage Division regarding surface and foul water sewers and SuDS measures, which must be strictly adhered to. Therefore, there are no cumulative impacts anticipated with this development.	Construction status unknown. A desk-based study was completed, satellite imagery of the reviewed. Construction had not commenced by March 2022.
2998/20 Decision: Grant Permission. Decision Date: 19 Oct 2020	St. Paul's College, Raheny	The development will consist of the following: construction of (i) a pergola structure consisting of a timber frame with retractable awning system above; (ii) sand and cement rendered block walls (0.8 m in height) with precast concrete capping to surround the proposed pergola structure; (iii) raised planted bedding along the block walls; and (iv) all site works necessary to facilitate the development. The proposed structure is located	The Planning Authority (DCC) granted permission for the development subject to 6 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, transport and drainage. Therefore, there are no cumulative impacts anticipated with this development.	Construction status unknown.

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment	Construction Status
		within the internal courtyard area at St. Paul's College.		
3803/21 Decision: Grant Permission. Decision Date: 17 Feb 2022	The Society of Jesus	<p>PROTECTED STRUCTURE: Permission for development at this site, which contains a Protected Structure known as Manresa House. The proposed development will consist of:</p> <p>1) a new single storey, flat-roofed building located to the northeast of the protected structure, to provide for new reception, dining, cooking and associated ancillary spaces, with rooflights, solar panels and part sedum roof;</p> <p>2) a new single-storey, flat-roofed open loggia structure forming a covered route from the existing Retreat Building to the proposed new building;</p> <p>3) associated hard landscaping, including new terrace and external steps, 2no. disabled parking bays, and extensive planting works to the courtyard;</p> <p>4) landscaping works, including the provision of 36 no. car-parking spaces, new planting to the west lawn and the formation of a new stormwater attenuation pond; and</p> <p>5) the removal of an existing single-storey, pitched roof timber structure.</p>	The Planning Authority (DCC) granted permission for the development subject to 12 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, surface water drainage and SuDS, transport, parking and maintaining the integrity of the protected structure. Therefore, there are no cumulative impacts anticipated with this development.	<p>Construction status unknown.</p> <p>A desk-based study was completed, satellite imagery of the reviewed. Construction had not commenced by March 2022.</p>

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment	Construction Status
<p>2038/18</p> <p>Decision: Grant Permission.</p> <p>Decision Date: 08 Jan 2019</p>	<p>MKN Property Group</p>	<p>PROTECTED STRUCTURE: Permission for a residential development of 72 no. units across 4 no. blocks with a single level basement, consisting of the change of use of the existing Verville Retreat building from nursing home use to residential use and the change of use of the existing former outbuilding to residential use. The overall development will comprise of the following: Block A: construction of a 4 storey building (3 storeys with a setback fourth storey) comprising 14 no. apartments (12 no. 2 bedroom units and 2 no. 3 bedroom units) with balconies/terraces to the north and south elevations; Block B: The change of use of the existing 4 storey Verville Retreat building from nursing home use to residential use comprising 9 no. apartments (3 no. 1 bedroom units and 6 no. 2 bedroom units). Demolition of later additions and extensions to the existing Verville Retreat building as well as associated modifications to elevations and internal modifications/reconfiguration of the refurbishments to the</p>	<p>The Planning Authority (DCC) granted Retention Permission under planning ref. no. 3081/20 on 28 Oct 2020. The development is subject to the conditions of the original planning grant, with additional conditions relating to drainage. Therefore, there are no cumulative impacts anticipated with this development.</p>	<p>A desk-based study was completed, satellite imagery of the reviewed. Construction commenced & ongoing as of March 2022.</p>

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment	Construction Status
		<p>existing building in order to accommodate the provision of the new apartment units and the construction of a new external stair core at the buildings eastern elevation; Block C: Construction of a 4 storey building (3 storeys with a setback fourth storey) comprising 48 no. apartments (1 no. studio apartment, 20 no. 1 bedroom units, 21 no. 2 bedroom apartments and 6 no. 3 bedroom apartments) with balconies/terraces to all elevations and roof garden; Block D: The conversion of the existing single storey outbuilding into 1 no. single storey, 2 bedroom mews dwelling with associated internal and external modifications to accommodate the proposed change of use; A basement level comprising a total of 69 no car parking spaces, 80 no. bicycle parking spaces, ancillary plant room and refuse storage areas; Revisions and improvements to the existing vehicular entrance to Vernon Avenue; Demolition of the existing single storey block to the north of Verville Retreat; landscaping (including communal and private open space); Boundary treatment;</p>		

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment	Construction Status
		and, all associated engineering and site development works necessary to facilitate the development.		
<p>4656/18</p> <p>Decision: Grant Permission.</p> <p>Decision Date: 27 Mar 2019</p>	<p>Clontarf Hospital</p>	<p>Permission for development at Castle Avenue, Clontarf, Dublin 3. The development will consist of the removal of the existing maintenance portacabins and demolition of the existing hard standing area, removal of 4 young trees which will be replaced in the area to suit the development, removal of 3 car spaces and the construction of a single storey maintenance building including, workshop, office, store and bin store and associated site works adjacent to the existing services yard.</p>	<p>The Planning Authority (DCC) granted permission for the development subject to 12 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, surface water drainage and SuDS, public infrastructure, public health and safety, amenity, ecology and sustainable development. Therefore, there are no cumulative impacts anticipated with this development.</p>	<p>Construction status unknown.</p> <p>A desk-based study was completed, satellite imagery of the reviewed. Construction had not commenced by March 2022.</p>

In terms of the effects of noise and vibrations, the distance from the Proposed Development to the off-site developments, the EIARs, EIA Screening Reports, management plans and other assessment reports associated with the aforementioned off-site projects contain details of mitigation measures required to ensure no likely significant or adverse environmental impacts arise as a result of the associated developments and as a result of this, will ensure there will be no significant noise and vibration impacts as a result of the Proposed Development. Due to the implementation of good construction practices at the Site of the Proposed Development and these offsite permitted developments, it is not anticipated that significant cumulative impacts will occur.

9.6.5 “Do Nothing” Impact

A ‘Do Nothing’ scenario would result in the Site remaining as greenfield lands. Noise and vibration levels would remain unchanged onsite and at nearby sensitive receptors.

9.7 Avoidance, Remedial & Mitigation Measures

9.7.1 Construction Phase

In order to control likely noise impacts caused by the Proposed Development, best available technology will be employed by the appointed Main Contractor to minimise noise from the construction operations and will comply with the mitigation measures as set out in *BS 5228-1: A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*:

- Selection of machinery/equipment with low inherent potential for generating noise.
- Siting of machinery/equipment as far away from sensitive receptors as permitted by site constraints.
- Avoid unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Where noise becomes a source of resonating body panels and cover plates, additional stiffening ribs or materials should be safely applied where appropriate.
- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Appointing a site representative responsible for matters relating to noise.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

The Construction and Demolition Waste Management Plan (CDWMP) outlines the following proposed environmental noise mitigation measures:

General Considerations:

- All site staff will be briefed on noise mitigation measures and the application of best practicable means to be employed to control noise.
- Site hoarding should be erected to maximise the reduction in noise levels.

- The contact details of the Main Contractor and site manager will be displayed to the public, together with the permitted operating hours, including any special permissions given for out of hours work.
- In the event that the Main Contractor gets a complaint about noise from a neighbour immediate action will be taken to remedy the situation.
- The site entrance will be located to minimise disturbance to noise sensitive receptors.
- Internal haul routes will be maintained, and steep gradients will be avoided.
- Material and plant loading and unloading will only take place during normal working hours unless the requirement for extended hours is for traffic management (i.e. road closure) or health and reasons (written approval, must be obtained from the planning authority prior to this activity being undertaken).
- Use rubber linings in chutes, dumpers and hoppers to reduce impact noise.
- Minimise opening and shutting of gates through good coordination of deliveries and vehicle movements.

Plant:

- Ensure that each item of plant and equipment complies with the noise limits quoted in the relevant European Commission Directive 2000/14/EC.
- Fit all plant and equipment with appropriate mufflers or silencers of the type recommended by the manufacturer.
- Use all plant and equipment only for the tasks for which it has been designed.
- Shut down all plant and equipment in intermittent use in the intervening periods between work or throttle down to a minimum.
- Power plant items by mains electricity rather than diesel generators.
- Maximise screening from existing features or structures and employ the use of partial or full enclosures for fixed plant.
- Locate movable plant away from noise sensitive receptors.
- All plant operators to be qualified in their specific piece of plant.
- Compressors and generators will be sited in areas least likely to give rise to nuisance where practicable.

Vehicle activity:

- Ensure all vehicle movement (on site) occur within normal working hours. (other than where extension of work requiring such movements has been granted in cases of required road closures or for health and safety reasons).
- Plan deliveries and vehicle movements so that vehicles are not waiting or queuing on the public highway, if unavoidable engines should be turned off.
- Plan the site layout to ensure that reversing is kept to a minimum.
- Where reversing is required use broadband reverse sirens or where it is safe to do so disengage all sirens and use banksmen.
- Rubber/neoprene or similar non-metal lining material matting to line the inside of material transportation vehicles to avoid first drop high noise levels.
- Wheel washing of vehicles prior to exiting the site will take place to ensure that adjoining roads are kept clean of dirt and debris. Regular washing of adjoining streets should also take place as required by road sweepers.

Demolition Phase:

- Employ the use of acoustic screening; this can include planning the demolition sequence to utilise screening afforded by buildings to be demolished.
- If working out of hours for Health and Safety reasons (following approval by the competent authority) limit demolition activities to low level noise activity (unless absolutely unavoidable).
- Use low impact demolition methods such as non-percussive plant where practicable.
- Use rotary drills and 'bursters' activated by hydraulic or electrical power or chemically based expansion compounds to facilitate fragmentation and excavation of hard material.
- Avoid the transfer of noise and vibration from demolition activities to adjoining occupied buildings through cutting any vibration transmission path or by structural separation of buildings.
- Consider the removal of larger sections by lifting them out and breaking them down either in an area away from sensitive receptors or off site.

Ground Works and Piling Phase:

- The following hierarchy of groundwork/piling methods should be used if ground conditions, design and safety allows;
 - Pressed in methods, e.g., hydraulic jacking
 - Auger/bored piling
 - Diaphragm walling
 - Vibratory piling or vibro-replacement
 - Driven Piling or dynamic consolidation
- The location and layout of the piling plant should be designed to minimise potential noise impact of generators and motors.
- Where impact piling is the only option utilise a non-metallic dolly between the hammer and driving helmet or enclose the hammer and helmet with an acoustic shroud.
- Consider concrete pour sizes and pump locations. Plan the start of concrete pours as early as possible to avoid overruns.
- Where obstructions are encountered, work should be stopped, and a review undertaken to ensure that work methods that minimise noise are used.
- When using an auger piling rig do not dislodge material from the auger by rotating it back and forth. Use alternate methods where safe to do so.
- Prepare pile caps using methods which minimise the use of breakers, e.g., use hydraulic splitters to crack the top of the pile.

Communication and Liaison:

- A Community Liaison Plan should be developed by the developer in consultation with local residents/businesses and a single point of contact nominated to engage with Dublin City Council and the residents/businesses and to handle complaints and communication of site information.
- All site staff should be briefed on the complaints procedure and mitigation requirements and their responsibilities to register and escalate complaints received.

The following control measures will also be implemented:

- The Site Manager will monitor a likelihood of prolonged exposure to excessive noise and commission noise surveying/monitoring programme where necessary.
- The Works Supervisor will assess risk arising from noise prior to each particular activity taking place and determine appropriate action. The aim will be to minimise the exposure to excessive noise levels.
 - If it is likely that the noise exposure exceeds Lower Action Value, then hearing protection must be made available.
 - If it is likely that the noise exposure exceeds Upper Action Value, then hearing protection is mandatory to be used. Work Supervisor will decide on the most suitable hearing protection to be used based on Exposure and worker's personal preference (earmuffs or earplugs).
- The Works Supervisor will ensure proposed measures are put in place and that their effectiveness and suitability is evaluated on regular bases.
- Site management will minimise noise at work by looking for alternative processes and/or working methods, which would make the work quieter and/or exposure times shorter.
- The Site Manager will liaise with all site contractors in order to effectively control noise exposure.
- The number of people working near source of the noise will be minimised.
- Plant and machinery will be compliant with current legislation and fitted with silencers as appropriate.
- Employees must use hearing protection where its use is made compulsory.
- Hearing protection zones will be identified where necessary.
- Spot checks on appropriate use of hearing protection will be carried out.
- Operators of rock breaking machines and workers nearby must wear adequate ear protection.

9.7.2 Operational Phase

During the Operational Phase of the Proposed Development, noise mitigation measures with respect to the outward impact of the Proposed Development are not deemed necessary.

9.7.3 "Worst Case" Scenario

The worst-case scenario would involve the failure of mitigation measures for the Proposed Development. In this scenario there is the potential for short-term, intermittent noise-related impacts.

9.8 Residual Impacts

Residual Impacts are defined as *'effects that are predicted to remain after all assessments and mitigation measures'*. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts.

Once the mitigation measures as proposed are implemented, no residual significant noise or vibration impacts are expected to arise as a result of the construction and operation of the Proposed Development

9.9 Monitoring

During the construction phase, noise and vibration monitoring will be carried out by the contractor to ensure that the recommended threshold levels set out in the EIAR Chapter or any conditioned noise and vibration limits are not exceeded.

The following monitoring measures will be implemented during the Construction Phase of the Proposed Development:

- Carry out regular on-site observation monitoring and checks/audits to ensure that best management practices are being used at all times. Such checks will include:
 - Hours of work;
 - Presence of mitigation measures;
 - Number and type of plant;
 - Construction methods.
- In the event that the Main Contractor gets a complaint about noise from a neighbour, he will act immediately to remedy the situation.
- A sound level digital meter will be employed as necessary to monitor noise, with results being recorded to inform the contractor of noise level.
- Site reviews must be recorded and made available for inspection.
- Appraise and review working methods, processes and procedures on a regular basis to ensure continue development of best management practices.

9.10 Interactions

9.10.1 Population and Human Health

The impact assessment of noise and vibration has concluded that additional noise associated with the operation of on-site machinery will be intermittent and will not create any major negative impacts beyond the Site boundary. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the Proposed Development.

It is noted that specific issues relating to Population and Human Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.

9.10.2 Biodiversity

Interactions between noise and vibration and biodiversity have been considered as the Proposed Development has the potential to cause short-term impacts on biodiversity as a result of noise and vibration in the absence of mitigation measures. However, the mitigation measures employed at the Proposed Development will ensure that biodiversity will not be affected. An assessment of the potential impact of the Proposed Development on biodiversity is included in Chapter 5 of this EIAR.

9.10.3 Land and Soil

Soil excavation works will cause an increase in noise; however, it has been determined within Chapter 9 of this EIAR that this increase in noise will be intermittent and insignificant.

9.10.4 Traffic

There will be an increase in traffic as a result of the Proposed Development, however as per Section 9.5.3.1 of this chapter, associated noise impacts have been deemed as insignificant.

9.11 Difficulties Encountered When Compiling

No difficulties were encountered.

9.12 References

BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise.

Dept. of Housing, Planning and Local Government (DHPLG), 2018. Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment August 2018.

Design Manual for Roads and Bridges Volume 11 Section 3 Part 7 (HD 213/11 – Revision 1) (The Highways Agency et al., 2011).

Dublin Agglomeration Third Environmental Noise Action Plan December 2018-2023.

Environmental Protection Agency (2006) Environmental Management in the Extractive Industry (Non-Scheduled Materials).

Environmental Protection Agency (2016) Guidance Note for Noise (NG4): Licence Applications, Surveys and Assessments in Relation to Scheduled Activities.

European Communities (EC) (Environmental Noise) Regulations 2018 (S.I. No. 549/2018).

EC (Environmental Noise 2006 (S.I. No. 140/2006).

EC Noise Emission by Equipment for Use Outdoors (Amendment) Regulations (S.I. No. 241/2006).

Guidelines for the Treatment of Noise & Vibration in National Road Schemes, National Roads Authority, Revision 1, 25th October 2004.

Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA May 2022).

ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures.

ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels.

ISO 9613-1:1993 Acoustics - Attenuation of sound during propagation outdoors -- Part 1: Calculation of the absorption of sound by the atmosphere.

ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors -- Part 2:
General method of calculation.

10 LANDSCAPE/TOWNSCAPE AND VISUAL ASSESSMENT

10.1 Introduction

This Landscape / Townscape and Visual Impact Assessment chapter of the EIAR has been prepared on behalf on the applicant, Raheny 3 Limited Partnership, in respect of a development on lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5. This chapter of the EIAR describes the landscape/townscape/visual context of the Proposed Development and assesses the likely impacts of the scheme on the receiving environment, in terms of both landscape character and visual amenity.

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 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 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/landscape, 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.

10.1.1 Statement of Authority

This Landscape/Townscape and Visual Assessment chapter of the EIAR was prepared by 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 residential mixed-used development projects.

The author of this EIAR chapter is Jamie Ball, a Senior Landscape Architect and team leader within Macro Works Ltd. He holds a BA LA Hons (University of Gloucestershire – 1998) and is a Corporate Member of Irish Landscape Institute (ILI). Within Macro Works, Jamie undertakes assessment for a range of development types across the consultancy firm's portfolio, including several residential mixed-used development projects. He has broad experience from several leading landscape consultancies, both domestic and international (i.e., US and Australia), and has been involved in a number of high-profile projects since 1999.

10.2 Study 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 Development Plan 2016-2022, as well as the draft Dublin City Development Plan 2022-2028;

- Fieldwork in the form of three site visits throughout 2021 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). It is important to note that the 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.

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. Indeed, the broader context of the study area is 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."

Please note, Digital Dimensions produced verified photomontages which are appended in Appendix Q of this EIAR. Based in Rathmines Dublin 6, Digital Dimensions is one of Ireland's leading architectural visualisation companies. Their verified photomontages were used to assess the likely visual impacts associated with the proposed development, as per Section 10.5.2 of this EIAR chapter.

10.2.1 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.

Table 10-1: Landscape/Townscape Value and Sensitivity

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.

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. See Table 10-2.

Table 10-2: Magnitude of Landscape/Townscape Impacts

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.

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.

Table 10-3: Impact Significance Matrix

Scale/Magnitude	Sensitivity of Receptor				
	<i>Very High</i>	<i>High</i>	<i>Medium</i>	<i>Low</i>	<i>Negligible</i>
<i>Very High</i>	Profound	Profound-substantial	Substantial	Moderate	Minor
<i>High</i>	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
<i>Medium</i>	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
<i>Low</i>	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
<i>Negligible</i>	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

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.

Please note that in relation 10-1 to 10-4 (above and below), the aforementioned draft EPA guidelines provide a general methodology and impact ratings for all environmental topics covered in an EIAR; the aforementioned GLVIA (2013) provides specific guidelines for landscape and visual impact assessment. Therefore, a combination of the draft EPA guidelines and the GLVIA has informed the methodology for the assessment. In respect of significance terminology and definitions, the EPA Guidance states:

“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 ...”.

It then provides a table of seven categories from ‘*Profound*’ to ‘*Imperceptible*’. By contrast, the GLVIA recommends the use of a “*word scale for degrees of significance*” and uses a four category example that does not use the term ‘significant’ within it, on the basis that “*problems can arise where separate topic assessments use the same or similar terminology in the evaluation of significance, but define these terms differently*”.

Instead, LVIA practitioners have flexibility to determine the scale terms they use, but must clearly indicate which categories are deemed to be ‘Significant’ impacts in EIA terms. In the case of the project LVIA, a clear indication of what categories are deemed to be significant was provided in respect of the identical significance matrices in the project LVIA i.e. ‘*Substantial*’ and ‘*Profound-substantial*’ as shown with mustard/yellow shading in Table 10.3, above.

10.2.2 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”.*

The visual sensitivity of receptors is determined in this Assessment by the following factors:

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;

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.

10.2.3 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.

Table 10-4: Magnitude of Visual Impacts

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.

10.2.4 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 (see Table 10-3).

10.2.5 Quality of Effects

In addition to assessing the significance of landscape/townscape effects and visual effects, EPA Guidance for EIAs requires that the quality of the effects is also determined. This could be negative/adverse, neutral, or positive/beneficial.

Whereas the introduction of new built elements into countryside areas more often results in negative landscape and visual effects, in urban and/or peri-urban settings, development proposals are often replacing one built feature with another. The consequence for the townscape character and visual amenity is often beneficial or may be a combination of positive effects and negative effects for different receptors. In the context of this assessment, the judgment of the quality of the effects is made in combination with the significance judgement for both landscape/townscape impacts and visual impacts (e.g., Moderate / Positive or Moderate / Negative).

10.2.6 Extent of Study Area

Owing to the scale of the built-up development in this locality, 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 10-1: Study area for the Proposed Development

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 in Section 10.3.1. 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 10.5.2.

10.3 The Existing and 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 in Section 10.3.1. 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.

10.3.1 Baseline Environment

10.3.1.1 Immediate Site Context

The 6.7 ha site is a relatively flat, low-lying, mostly greenfield site that is bound to the north, east and south by St Anne's Park; a popular and much-visited large urban park of c.110 ha situated between Raheny and Clontarf. The site is also a manmade, modified landscape, like that of its vicinity/hinterland. In 1948, 12.5 ha of the park was purchased from Dublin Corporation for it to become St Paul's College (boy's secondary school) in 1950. The site, therefore, has been private property for over 70 years and not part of St. Anne's Park during that time. However, there is a tenable visual connection between the site and its park surrounds, as well as a broadly similar landscape fabric and character between it and the western end of the park.

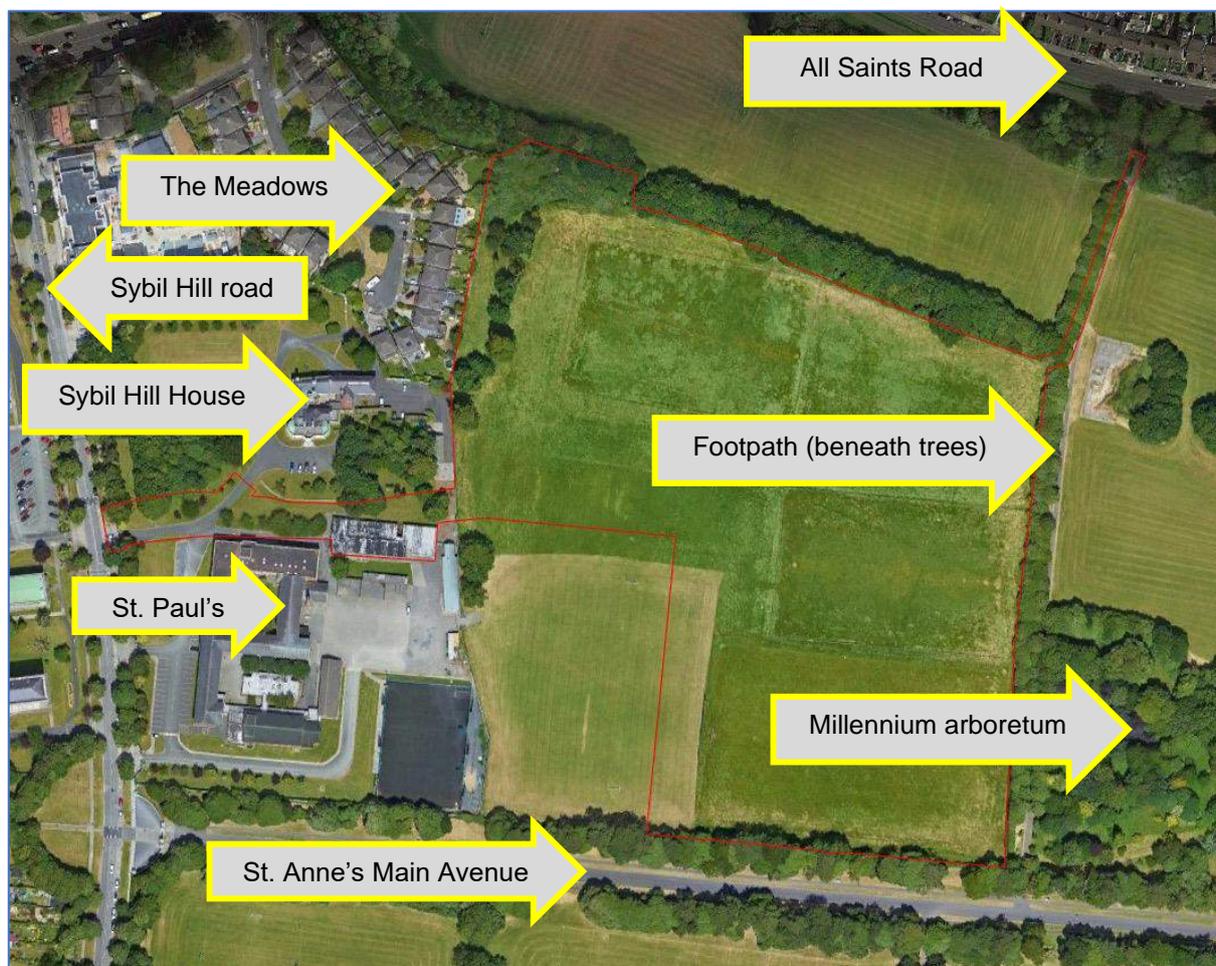


Figure 10-2: Site boundary overlaid onto Google Earth imagery (2018 capture)

Previously the site formed four of the playing pitches of St. Paul's. In that regard, it has served in recent decades as rather monocultural in character, with a vast blanket of unbroken amenity grass with some trees in the northwest corner of the site. However, there are mature treelines

immediately outside the site's northern, eastern and southern site boundaries, with public pathways aligned in close proximity to the site's eastern and southern boundary (i.e., outside the site boundaries). It is understood that the site has not been accessible to the public and/or park users for several decades, being surrounded by tall fences/walls. In the last approx. 3 years, following the purchase of the site from St. Paul's, the site has been cordoned off from the school, during which time it has been gradually reverting back to nature (i.e., recultivating through self-seeding and lack of maintenance), as per Figure 10-3.

The extended western 'arm' of the site, however, is more diverse and complex. It takes the form of a 17-33m wide, east-west corridor crossing over the grounds of St. Paul's school in areas that are currently occupied by either prefabs/low temporary building, internal campus access roads, lawns or trees, before emerging at an existing entrance onto Sybil Hill that currently serves Sybil Hill House. While a short thin corridor also emerges from the northeast corner of the site, beneath an existing pathway connecting to St. Assam's Road, this is of less relevance, as no overgrounds works are proposed for this area (i.e., only subsurface utilities).

Along with Sybil Hill House (protected structure) and the Meadows residential *cul de sac*, the grounds of St. Paul's are set to the site's immediate west. Within 100m north of the site are GAA (public) playing pitches and the small Naniken River. Further playing pitches and a (publicly-accessible) arboretum lie within 50m of the site's eastern boundary (i.e., the 'Millennium Arboretum'), while a pathway connecting St. Anne's Main Avenue to All Saints Road runs close to this entire eastern boundary, though mature vegetation tends to screen the site from most of this pathway. To the immediate south of the site is the tree-lined, 19th Century main Avenue of St. Anne's Park (see Figure 10-4), with tall, mature evergreens densely clumped to the immediate south of this boundary.



Figure 10-3: A dark green paladin fence aligns the eastern and southern site boundaries, and part of the northern boundary

In terms of site boundaries, a dark green paladin fence aligns the eastern and southern site boundaries (see Figure 10-3), and at least half of the northern boundary. Blue wooden hoarding currently demarcates the southwestern corner of the site, separating the site from the sole grass pitch that is in ownership of St. Paul's. A concrete wall with railings above it marks the north-western site boundary. A stone wall marks a smaller section of the northern site boundary, which is aligned by a dense thicket of mature trees (i.e., an ecological corridor) to its immediate north. The site, therefore, is not permeable. Neither is it accessible to the public, and has been private property for at least the last 70 years.



Figure 10-4: The site when viewed from its southern boundary.



Figure 10-5: To the immediate south of the site is the tree-lined, 19th Century main Avenue of St. Anne's Park.

10.3.1.2 Broader Townscape Context

St. Anne's Park is set between Raheny, to its north, and Clontarf, to its south and west, with Dublin Bay flanking the eastern edge of the park (i.e., outside the study area). It is c. 110 ha in size, making it the second largest municipal park in Dublin.

In the early 19th century, most of the park, as well as the site lands, were under agricultural production (see Figure 10-5), at a period in which Raheny and Clontarf would have been regarded as rural locations, distinctively removed from Dublin city (it was 1900 before Clontarf was formally incorporated into the City of Dublin). Indeed, the site was part of the townland at Maryville, whereas the eastern sections of the park are mostly in the Harmonstown, Charleville and Bettyville townlands. Maryville was a large house and estate, very close to Sybil Hill House, which was within the site lands but has long since been demolished.

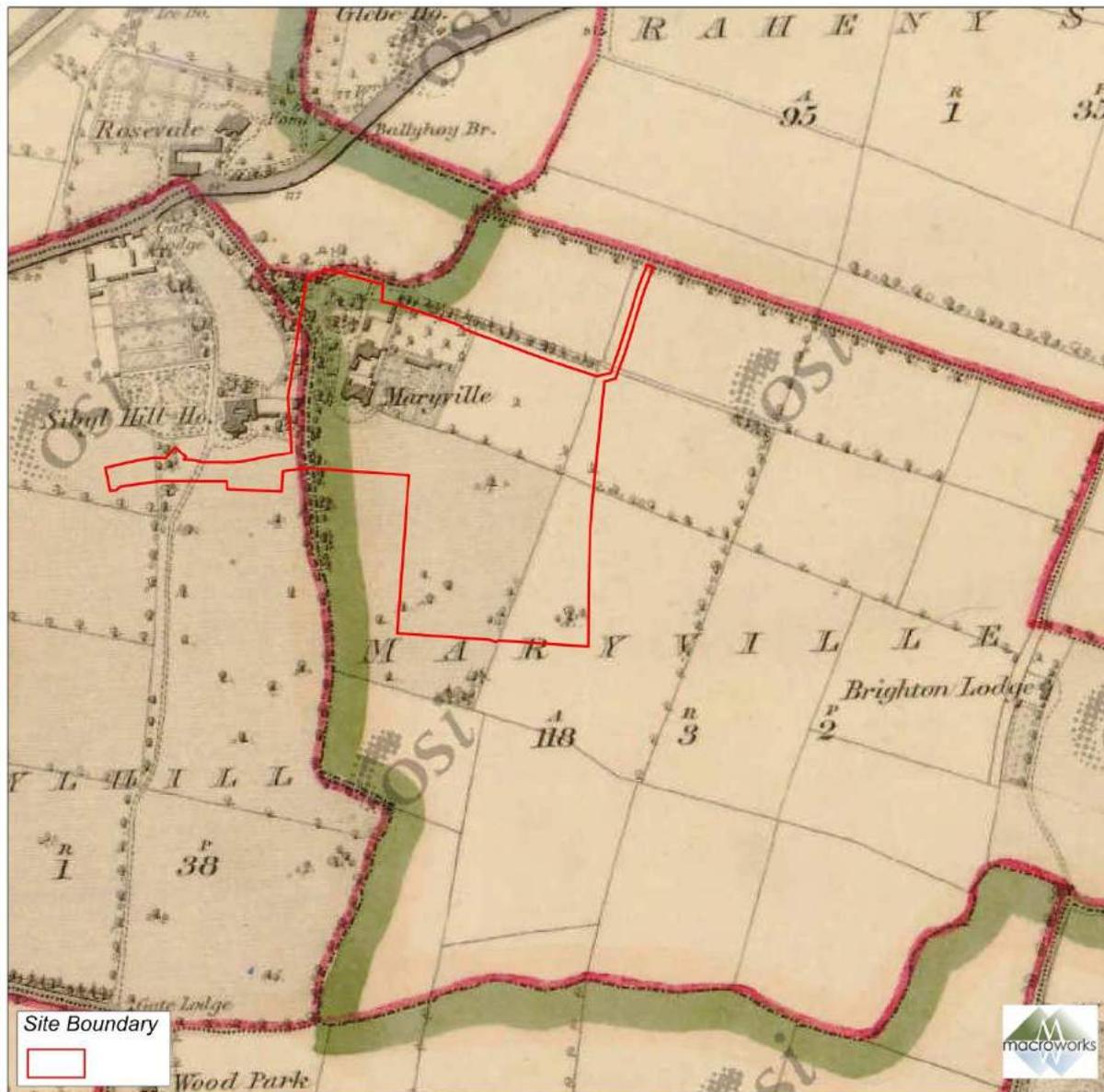


Figure 10-6: Extract of Ordnance Survey 1829-1842 map, showing the agricultural nature of the site.

In 1837, Sir Benjamin Lee Guinness purchased the estate of Thornhill within the Harmonstown townland and only later added lands, to the west and north, of Bettyville, Charleville, Maryville (in which the site lands are located) and Sybil Hill, to form a 202 hectares (500 acres) estate. He then renamed the Thornville house and estate to St. Anne's, after a holy well located in the eastern end of the park. The most distinctive and well-recognised features of the park were laid out in the mid-late 19th Century, and with the exception of the Main Avenue, tend to be located in the eastern/coastal end of the site (i.e., more than 500m from the site that represent St. Anne's historic core. These include the Naniken riverside walk, the clock tower (and walled garden), the Red Stables, the Temple of Isis (and artificial duck pond), the Herculean Temple, the Chestnut Walk and the Annie Lee Tower Bridge, among other heritage estate features all within the historic core. This is reflective of the fact that the original large, Italianate-style, St. Anne's House that was commissioned in 1837 (gutted by fire in 1943 and demolished in 1968) was located more than 1km from the site, at the heart of the historic core.

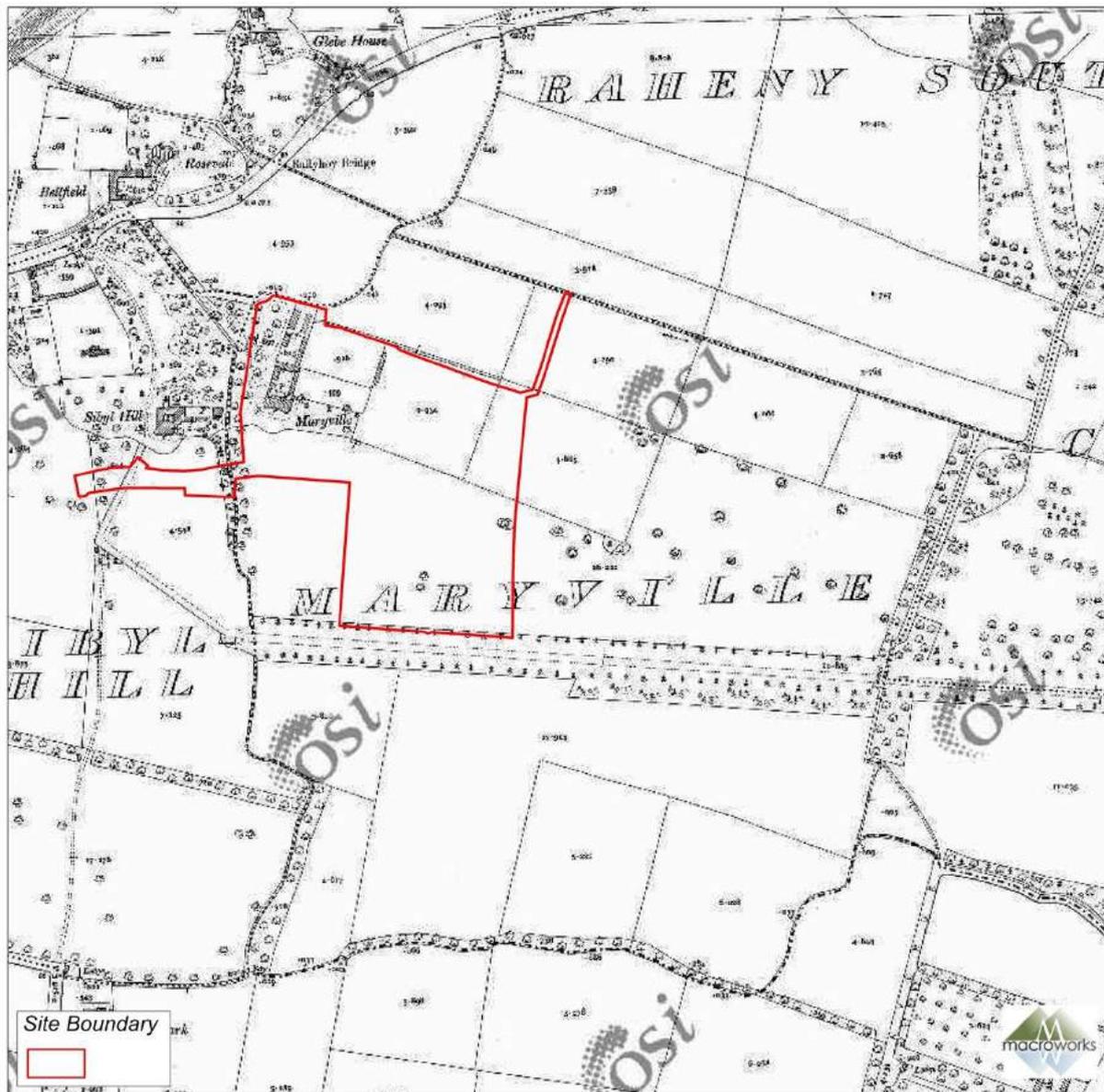


Figure 10-7: Extract of Ordnance Survey 1897-1913 map, showing site lands to be then a mix of agricultural lands (in its north half) and 'landscaped' parkland (in its southern half).

The sense of place within the historic core is infused with numerous serpentine paths, specimen trees and charming remnants of an intricate 19th Century private Demesne. Its aesthetic pleasure grounds, walled gardens, follies, intimate spaces and tree-dotted, parkland landscape generate a sense of romance, intrigue and serendipity in the park user who feels he/she is re-discovering the 'lost estate.' This is at stark odds to that of other areas of the park (including the site), that were only developed for recreational purposes within the last 70 years.

The perfectly straight, near 1.5km-long Main Avenue of the park once connected the formal park entrance to St. Anne's House and was planted in the late 19th Century with an alternating layout of Evergreen Oak and Scot's Pine. These large, densely-planted evergreen trees now align the southern boundary of the site (i.e., outside the site boundary) and are a distinctive feature of the park all year round, channelling views east/west, with limited visibility of features north or south of the avenue. The western end of the Main Avenue was later extended by a further approx. 150m west to meet the recently constructed Sybil Hill road, later in the 20th

Century, As referenced in Figure 10-6, by the late 19th century/early 20th Century, the site lands were a mix of agricultural lands (in its north half) and 'landscaped' parkland closer to the Main Avenue, representative of the esteemed estate it had become.

In 1939, approx. 180 ha (445 acres) of the original estate were sold to Dublin Corporation and by 1956, the entirety of the remaining land was owned by Dublin Corporation. In that regard, the only capacity for the site to ever have been part of St. Anne's Park could have been between 1939 and 1950 (when St. Paul's College opened, with the site as it's private playing pitches). In the following decade, approx. 81ha (200 acres) of the estate were developed for public housing. The only 'iconic' feature of the park to be added since that time is that of the Rose Garden, in 1975, located more than 450m from the site, in which a celebrated rose festival takes place each July. However, the overall landscape character and *genius loci* of the western side and north-eastern end of the park is not similar to that of the historic core of the park, with the Main Avenue serving as a verdant corridor between these distinct characters.



Figure 10-8: Playing pitches south of the Main Avenue and south of the site. Please note the density of tall, dense trees (aligning the Main Avenue) to the north (i.e., left) of this view.

For more than the last half century, the park's western half (i.e., broadly within 500m of the site) and north-eastern extreme continues to be characterised by extensive playing pitches among tall, mature treelines, with a mid-late 20th Century, sport-focused public park identity to it, with a relatively lower degree of visual amenity and visual sensitivity. This is also influenced by the partially-visible suburban boundaries of the park being more palpable at the western side, where intervisibility with surrounding modern residences, schools and roads is more common. There are over 30 playing pitches (mostly GAA and soccer) in the park, as well as a small, public par-3 golf course (located approx. 450m east of the site) and a public 18-court tennis club (approx. 400m northeast of the site). In recent years, prior to Covid, large (ticketed) 'big name' music concerts have been organised in the western end of the park in summer, across sporting pitches south of the Main Avenue. The park is heavily frequented, too, for Saturday morning park runs and farmers markets; the latter located by the Red Stables.

Within 200m north of the site is the dense, residential streets of Raheny and Harmonstown, some of which are on lands that formed part of the original St. Anne's estate. Within 500m west (Killester) and south (Clontarf) of the site is again an intensely residential locale, reflective of the inner suburb location of the site. Indeed, this is reflected in the high population within proximity to the park; localities that are more populous than most large Irish towns. These consist of Clontarf (over 32,000 residents); Raheny (over 18,000), Killester and Harmonstown (each approx. 5,000 residents). In that regard, there are approx. 60,000 residents within comfortable walking distance to St. Anne's. This helps contextualise it as a large European urban park with the centre of a European capital - Dublin City – located approximately 5km away.

East of St. Anne's Park and outside the study area is Dublin Bay, including the north Bull Island. This much-prized and protected coastal resource is at a considerable remove from the site lands, not just in distance but in geographical, geological, historical, social and cultural context to the western end of the park.

In terms of housing typologies in the broader area, while 2-storey, extensive housing is prevalent across Raheny, Clontarf, Harmonstown and Killester, primarily from the mid 20th Century onwards, there are multiple instances of higher-density apartment complexes of 3-5 storeys from more recent decades. Aligning Sybil Hill Road (R808) is the Ardilaun Court residential development, built in 2018 and being 4-5 storeys in height, approx. 100m west of the site. On the western side of Sybil Hill Road (R808) is the Sacred Heart nursing home, constructed in 1971 and also being five storeys in height. Within 200m south of the park is the 1960s Seapark development: 10 no. apartment blocks ranging from 3-4 storeys. Similarly, aligning the park's southern boundary is the more recent Belgrove Park, consisting of multiple 3-4 storey residential blocks. However, immediately abutting the western boundary of the site is St. Paul's College (a two-storey 1950s structure) and Sybil Hill House, which has been owned by St. Pauls College since the 1950s and is a two-storey protected structure from the 1750s, with a small section of its original ha-ha surviving to the south of the property.

10.3.2 Planning Policy Context

10.3.2.1 Dublin City Development Plan 2016-2022

In terms of land use zoning (Map B of the Dublin CDP) the Proposed Development is contained in 'Zone Z15', whose zoning objective is "to protect and provide for institutional and community uses" (see Figure 10-8). There are no additional zoning objectives relevant to the site (e.g., conservation area, Architectural Conservations Areas, Protected Structures, Sites/Zones of Archaeological Interest). According to Section 14.8.14 of the Dublin CDP, the 'Permissible Uses' for Zoning Objective Z15 entail:

"Buildings for the health, safety and welfare of the public; childcare facility, community facility, cultural/recreational building and uses, education, medical and related consultants, open space, place of public worship, public service installation, residential institution."

Those uses that 'Open for Consideration' entail:

“Bed and breakfast, car park ancillary to main use, conference centre, funeral home, guest house, hostel, hotel, municipal golf course, residential, student accommodation, training centre.”

It is worth noting that, unlike the site, St. Anne's Park is Zoned Z9, “To preserve, provide and improve recreational amenity and open space and green networks,” with the added Specific Objective of being a ‘Conservation Area.’ A small section of the site of the Proposed Development is zoned Z9, as this includes lands within St. Anne's Park required to provide for the routing of a surface water discharge from the site via St. Anne's Park to the Naniken River, however, no residential development is proposed on the lands contained within the application boundary which are zoned Z9.



Figure 10-9: Extract of Map B of the Dublin Development Plan, showing how the site is contained within Zone Z15

Chapter 4 – ‘Shape and Structure of the City’ of the Dublin City Development Plan (2016-2022) contains relevant policies in respect of Dublin’s inner suburbs and outer city. Section 4.4 pertains to the ‘Strategic Approach,’ for the city’s development. It states:

“The vision for the urban form and structure of the city is to achieve a high quality, sustainable urban and natural environment, which is attractive to residents, workers and visitors.”

The key approaches to achieving this vision underpinning the development plan, which are relevant to the site and the Proposed Development, include:

- *“The creation of a more compact city, where residents can live close to their places of work or study, and can easily traverse the city, thereby reducing urban sprawl and unsustainable travel patterns.*
- *The creation and nurturing of sustainable neighbourhoods, which are designed to facilitate walking and cycling, close to public transport insofar as possible and a range of community infrastructure, in quality, more intensive mixed-use environments.*
- *The development of a well-designed and defined network of streets and quality urban spaces, together with the achievement of a good mix of uses to encourage vitality, in well-designed buildings which are appropriate to their context.*
- *The development of a green infrastructure strategy for recreation, amenity, biodiversity and climate change reasons.*
- *The integration of a cultural and social vision into place-making.”*

Policies and objectives outlined within Chapter 4 of the development plan that are relevant to the site and/or Proposed Development include:

SC5: *To promote the urban design and architectural principles set out in Chapter 15, and in the Dublin City Public Realm Strategy 2012, in order to achieve a quality, compact, well-connected city.*

SC10: *To develop and support the hierarchy of the suburban centres, ranging from the top tier key district centres, to district centres/urban villages and neighbourhood centres, in order to support the sustainable consolidation of the city and provide for the essential economic and community support for local neighbourhoods, including post offices and banks, where feasible, and to promote and enhance the distinctive character and sense of place of these areas.*

SC11: *To promote employment and economic opportunities in the KDCs and in district centres/urban villages and in neighbourhood centres in the identified innovation corridors and clusters.*

SC12: *To ensure that development within or affecting Dublin's villages protects their character.*

SC13: *To promote sustainable densities, particularly in public transport corridors, which will enhance the urban form and spatial structure of the city, which are appropriate to their context, and which are supported by a full range of community infrastructure such as schools, shops and recreational areas, having regard to the safeguarding criteria set out in Chapter 16.*

SC14: *To promote a variety of housing and apartment types which will create a distinctive sense of place in particular areas and neighbourhoods, including coherent streets and open spaces.*

SC15: *To recognise and promote green infrastructure and landscape as an integral part of the form and structure of the city, including streets and public spaces.*

Objectives relevant to the site and/or Proposed Development:

SC04: *To undertake a views and prospects study, with the aim of compiling a list of views and prospects for protection and/ or enhancement which will be integrated with and complement the urban form and structure of the city.*

Approach to Taller Buildings

Section 4.5.4.1 specifically deals with the 'Approach to Taller Buildings' and begins with the statement that:

"Dublin City Council acknowledges the intrinsic quality of Dublin as a low-rise city and considers that it should remain predominantly so. The vast majority of the city area is identified as not being suitable for mid-rise or taller buildings. The City Council remains committed to the need to protect conservation areas, architectural conservation areas and the historic core of the city. However, taller buildings can also play an important visual role and can make a positive contribution to the skyline of a city. Dublin City Council recognises the merit of taller buildings, including landmark buildings, in a very limited number of locations at a scale appropriate for Dublin."

Relevant Policy in relation to building height includes:

SC16: *To recognise that Dublin City is fundamentally a low-rise city and that the intrinsic quality associated with this feature is protected whilst also recognising the potential and need for taller buildings in a limited number of locations subject to the provisions of a relevant LAP, SDZ or within the designated strategic development regeneration area (SDRA).*

SC18: *To promote a co-ordinated approach to the provision of tall buildings through local area plans, strategic development zones and the strategic development and regeneration areas principles, in order to prevent visual clutter or cumulative negative visual disruption of the skyline.*

Designated Scenic Views and Prospects

Also contained within Chapter 4 Dublin City Development Plan is a map illustrating views and prospects for protection. However, there are no designated views and prospects within the study area.

10.3.2.2 Draft Dublin City Development Plan 2022-2028

Chapter 4 – 'Shape and Structure of the City' of the draft Dublin City Development Plan 2022-2028 contains relevant policies in respect of Dublin's inner suburbs and outer city. Section 4.5 pertains to 'Policies and objectives,' those of which are relevant to the site and/or Proposed Development (in relation to the Inner Suburbs) include:

SC8: *To support the development of the inner suburbs and outer city in accordance with the strategic development areas and corridors set out under the Dublin Metropolitan Area Strategic Plan and fully maximise opportunities for intensification of infill, brownfield and underutilised land where it aligns with existing and pipeline public transport infrastructure.*

SC9: *To develop and support the hierarchy of the suburban centres, including Key Urban Villages, Urban Villages and Neighbourhood Centres, in order to:*

- *support the sustainable consolidation of the city and align with the principles of the 15 minute city;*
- *provide for the essential economic and community support for local neighbourhoods;*
- *promote and enhance the distinctive character and sense of place of these areas by ensuring an appropriate mix of retail and retail services.*

Approach to Taller Buildings

Section 4.5.4 of the draft CDP pertains to 'Increased Height as part of the urban form and spatial structure of Dublin.'

SC14 Building Height Strategy: To ensure a strategic approach to building height in the city that accords with The Urban Development and Building Height Guidelines for Planning Authorities (2018) and in particular, SPPR 1 to 4.

SC15 Building Height Uses: To support the development of an adequate mix of uses in proposals for larger scale development which are increasing height or proposing a taller building in accordance with SPPR 2

10.3.2.3 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 plans 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.*

10.3.2.4 National Parks & Wildlife Service (NPWS) designations

There are no Special Areas of Conservation, Special Protection Area, Natural Heritage Area or proposed Natural Heritage Area with the site or its vicinity, including St. Anne's Park. Be that as is may, it is worth repeating that according to Dublin City Development Plan 2016-2022 (see Section 10.3.3.1), the site is not a “Conservation Area” but the remaining areas of St. Anne's is.

10.4 Characteristics of the Proposed Development

10.4.1 Project Description

Raheny 3 Limited Partnership are applying for permission for development on lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5. The site is bound to the north, east and south by St Anne's Park and to the west by residential development at The Meadows, Sybil Hill House (a Protected Structure) and St Paul's College. Vehicular access to the site is from Sybil Hill Road.

The Proposed Development consists of the construction of a residential and nursing home development set out in 7 no. blocks, ranging in height from 4-7 storeys to accommodate 580 no. apartments, residential tenant amenity spaces, a crèche and a 100-bed nursing home. The site will accommodate car parking spaces, bicycle parking spaces, storage, services and plant areas at both basement and podium level.

Landscaping will include extensive communal amenity areas, and a significant public open space provision on the east and south of the site. The proposed application includes all site landscaping works, green roofs, substations, boundary treatments, lighting, servicing, signage, surface water attenuation facilities and associated and ancillary works, including site

development works and services above and below ground. For a full description of the Proposed Development please refer to the Statutory Notices.

10.4.1.1 Additional Landscape & Visual Characteristics Associated with the Proposed Development

A comprehensive tree survey of the site was conducted in late 2021 by the consulting Arborists, The Tree File. It found that:

“While the broader Arboricultural review investigated 235no trees or tree groups, only 127no. of these are considered physiologically pertinent to the site and the proposed development ... The proposed development will see the loss of only 36 individual trees and part of “Tree Line 2”. Of these 36no. trees, 10no. have been categorised at “U” grade trees and have been recommended for removal regardless of development works.”

It is worth noting that of the trees lost as a result of the Proposed Development, the vast majority of these are also non-native species.

10.5 Potential Impact of the Proposed Development

10.5.1 Landscape Impacts of the Proposed Development

10.5.1.1 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.”

As was previously established in Section 10.3 of this chapter, although this is largely a greenfield site of an open verdant character, it is also a manmade, modified landscape, like that of its vicinity/hinterland. The site is not publicly accessible, nor does it provide any public open space, but is, instead, secured/cordoned off from the public, as it has been for over 70 years. Indeed, the only capacity of the site to ever have been part of the Park would have been between 1939 and 1950, at most. This is also reflected in its zoning, as set out in Section 10.3.2.1, which states that the Proposed Development is contained in ‘Zone Z15’, whose zoning objective is “to protect and provide for institutional and community uses”; a zoning that is compatible with that across the northern half of Sybil Hill (road), while being, understandably, at odds to all of St. Anne’s Park. A small section of the site is zoned Z9 and will provide for the routing of a surface water discharge from the site via St. Anne’s Park to the Naniken River. This Zoning Objective is “To preserve, provide and improve recreational amenity and open space and green networks.” No residential development is proposed on the lands contained within the application boundary which are zoned Z9.

Furthermore, there are no additional zoning objectives relevant to the site, including conservation areas, Architectural Conservations Areas, Protected Structures or Sites/Zones of Archaeological Interest. Neither are there any Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas or proposed Natural Heritage Areas within the site

or its vicinity, including St. Anne's Park. Similarly, there are no scenic designations associated with the site, nor anywhere within the study area.

The landscape character and fabric of the site is distinctly that of mid-late 20th century sport-focused recreation, albeit not for the public but exclusively pupils of St. Paul's College. While the thick, verdant corridor of St. Anne's Main Avenue runs to the immediate south of the southern boundary, the historic core of St. Anne's Park remains almost 400m distance from the site, with the most 'iconic' features of the park mostly being more than 800m from the site. Indeed, the site's evolution through the 19th and 20th century is distinctly separate to that of the historic core, and one with a lower degree of visual amenity and visual sensitivity. Be that as it may, there is a broadly similar landscape fabric and character between the site and the western and north-eastern end of the park, as demonstrated in Figure 10-9. This is because these areas, too, principally evolved in the mid-late 20th century for sport-focused recreational use, while also being at a similar remove from the Park's historic core.

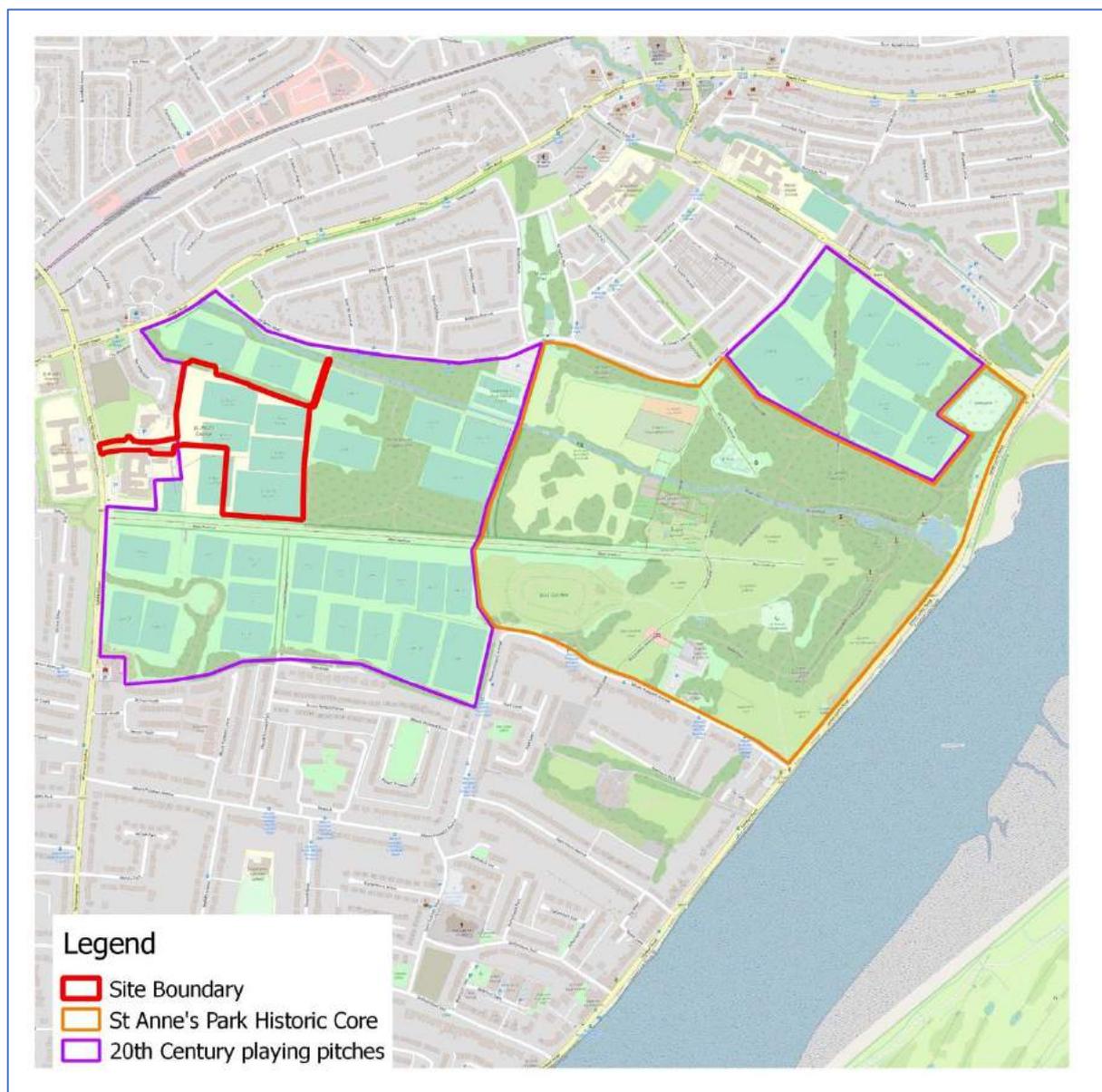


Figure 10-10: Landscape character and fabric within the site and St. Anne's Park.

Lastly, while the study area is notable for the high amount of public open space (mostly in the form of St. Anne's Park), residential development is by far the common form of land use, overall, with numerous multiple storey buildings within the study area, some of which adjoin the boundaries of the park, with others located within 200-300m of it.

On balance of the factors outlined above, the sensitivity of the receiving townscape setting is considered to be **Medium-low**.

10.5.1.2 Construction Phase landscape impacts

There will be permanent physical effects to the land cover of the site, which are not readily reversible. During the construction stage of the Proposed Development, which is estimated to take approx. 18 months, there will be intense construction-related activity within and around the site, including approach roads. This will include, but is not limited to:

- HGVs transporting materials to and from the site;
- Movement of heavy earth-moving machinery and the erection of several tall tower cranes on-site;
- Temporary storage of excavated materials and construction materials on-site;
- Gradual emergence of the proposed blocks, and associated works;
- Security fencing and site lighting.

Construction stage impacts on landscape/townscape character will be 'short-term' (i.e., lasting 1-7 years), in accordance with the EPA definitions of impact duration. Furthermore, the context of this construction activity is within a suburban, residential setting where the construction of multi-storey buildings has been long established. As it is mostly a greenfield site, there is a minimal degree of demolition associated with the site; namely, approx. 15m of concrete wall and railing, as well as a single-storey temporary building (i.e., prefabs).

According to the aforementioned Arboricultural Chapter of the EIAR accompanying this application (as per Section 10.4.1.1), a comprehensive tree survey of the site was conducted in late 2021 by the consulting Arborists, The Tree File. It found that:

"While the broader Arboricultural review investigated 235 no trees or tree groups, only 127 no. of these are considered physiologically pertinent to the site and the proposed development ... The proposed development will see the loss of only 36 individual trees and part of "Tree Line 2". Of these 36 no. trees, 10 no. have been categorised at "U" grade trees and have been recommended for removal regardless of development works."

It is worth noting that of the trees lost as a result of the Proposed Development, the vast majority of these are also non-native species.

On the basis of the reasons outlined above, the magnitude of construction stage landscape/townscape impacts is deemed to be Medium. When combined with the Medium-low sensitivity of the receiving landscape, the overall significance of construction stage landscape/townscape impacts is considered to be **Moderate**, in accordance with the criteria contained in Section 1.5. In addition, the quality of construction stage effects is deemed to be **Negative**.

10.5.1.3 Operational Phase landscape impacts

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.

The most notable landscape/townscape impacts of the application site will result from the permanent 7 no. blocks that mostly range in height from 4 to 7 storeys. While this will be a distinct vertical imprint into what had been mostly a grassy, greenfield site, it also represents a broader compatibility with the townscape fabric and character along the northern end of Sybil Hill (i.e., within 100m of the site), and residential nature of the wider study area.

To be more detailed: the wider locality is an intensely residential inner suburb of a European capital, with the site being approximately 5km from city centre. While the vast majority of residential development within the broader locality is extensive, two-storey housing, there are also multiple instances of higher-density apartment complexes of 3-5 storeys from more recent decades. These include: the 4-5 storey Ardilaun Court and the five-storey Sacred Heart nursing home, both within 100m of the site along Sybil Hill; Seapark is within 200m south of St. Anne's and is 10 no. apartment blocks ranging from 3-4 storeys; aligning the park's southern boundary is the more recent Belgrove Park, consisting of multiple 3-4 storey residential blocks.

In terms of the Proposed Development's likely impact on the character of the adjacent St. Anne's Park, while the proposal represents a distinct change of land use (i.e., from chiefly sporting pitches, like those in adjacent areas of the park, to chiefly residential, like those adjoining the park), the presence of existing tall mature treelines to all sides of the site adjoining the park will maintain the disconnect the Park has had from this cordoned off private property. These tall, mature treelines will have the effect of 'softening' the vertical scale of the development, helping to 'anchor' it into the surrounding townscape fabric and character, while also enriching it. Be that as it may, the completion of construction will mark an escalation and intensification of that fabric within the study area, while being attuned to and compatible with it. However, while the proposal will result in a distinct increase in the scale and intensity of development within the application site, and its immediate surrounds, such a development is to be expected in a residential, ever-evolving suburb as this, and will knit into the prevailing urban fabric rather than contrasting against it.

Yet the Proposed Development's impact on the character of the receiving landscape/townscape is not entirely centred upon the proposed 7 No. blocks, as it also includes a crèche and a 100-bed nursing home. The proposal will accommodate car parking spaces, bicycle parking spaces, storage, services and plant areas, but also vehicular/pedestrian/cyclist accesses to/from Sybil Hill and St. Anne's Park.

Crucially, the Proposed Development will provide for c.20,969.91sqm of public open space, or c.31.15% on this site area of c.6.7ha. The Proposed Development will also include high quality, Landscape Architect-designed open spaces, planting and boundary treatments. 714 no. new trees and extensive planting mixes (including multiple varieties of shrubs, grasses, bulbs, perennials, groundcovers and pond planting) will be densely planted throughout the site to further enrich its existing verdant character. A total of 33 no. existing trees will be removed. In summary, 33 no. existing trees will be removed and 714 no. new trees will be planted resulting in an overall net gain of tree cover.

Owing to the sizable net gain of not just proposed trees but other proposed planting, upon establishment the site will bear a considerably stronger sylvan character than it does at present.

For the reasons outlined above, the magnitude of operational stage landscape/townscape impacts is considered to be **Medium-Low**. In accordance with the Landscape/Visual significance matrix contained in Table 10-3, the combination of a 'Medium-low' townscape sensitivity judgement and a 'Medium-low' townscape impact magnitude judgment results in a **Moderate-slight** overall operational stage significance of townscape impact. On balance of the intensity and scale of new development against the quality of the architectural and landscape design the operational landscape effect is deemed to be marginally negative i.e., **Neutral-Negative**.

10.5.1.4 The "Do Nothing" Scenario

In the event that the Proposed Development does not proceed, the site is likely to remain a fallow/unmaintained greenfield site on private property, fenced off/secured from the public (e.g., park users in the adjacent St. Anne's Park) as well as pupils/staff of St. Paul's College.

10.5.2 Visual Impacts of the Proposed Development

10.5.2.1 Visual Receptor Sensitivity

Viewshed Reference Points (VRP's) are the locations used to study the visual impacts of the proposal in detail. It is not warranted to include each and every location that provides a view of this development as this would result in an unwieldy chapter of the EIAR and make it extremely difficult to draw out the key impacts arising from the project. 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 (e.g., from regional roads, upwards);
- Amenity and heritage features.

In the case of the study area for the Proposed Development, it is taken that all such receptors are within a 'Centre of Population,' it being Dublin City. In addition, there are no known designated scenic route or views, or even Key Views, within the study area.

In consideration of the visual receptor criteria set out in section 10.2.2, the main variation in the nature of views and those availing of those views, in this instance, relates to an overt sense of place. As previously set out in Section 10.3.1 the study area's character and sense of place is that of an intensely residential locality, within which is a very large municipal that borders the site. Thus, there is a very clear division between the visual sensitivity of receptors within the residential sector, compared to those within the recreational amenity of St. Anne's Park. However, there is a further distinction to be made between receptors from institutional settings

along the Sybil Hill, as well as those from major routes within the site study. Thus, in terms of visual sensitivity, the receptors will be categorised as those being:

- Chiefly residential in land use and character;
- Chiefly that of recreational/amenity use;
- Chiefly educational and/or institutional in land use and character;
- Chiefly that of a major route.

Those receptors that are chiefly residential in land use and character entail: VP1, VP5, VP7, VP11, VP12, VP13, VP14, VP18. Overall, views within this receptor base are deemed to be of 'Medium-low' visual sensitivity, on balance of a multitude of factors set out in Section 10.2.2.

Those receptors that are chiefly recreational/amenity in land use entail: VP10, VP11, VP15, VP16, VP17, VP19, VP20 and VP22. Overall, views within this receptor base are deemed to be of 'Medium' visual sensitivity, on balance of a multitude of factors set out in Section 10.2.2.

Those receptors that are chiefly educational and/or institutional in land use entail: VP8 and VP9. Overall, views within this receptor base are deemed to be of 'Medium-low' visual sensitivity, on balance of a multitude of factors set out in Section 10.2.2.

Those receptors that are chiefly that of a major route entail: VP2, VP3, VP4 & VP6. Overall, views within this receptor base are deemed to be of 'Medium-low' visual sensitivity, on balance of a multitude of factors set out in Section 10.2.2.

10.5.2.2 Magnitude of Visual Effect

10.5.2.2.1 Construction Phase:

In terms of Construction Phase visual impacts, these will be subject to continual and decisive visual change through the approx. 18-month construction period. Such short-term and continually evolving impacts cannot feasibly be supported by photomontages but will be similar to those described in the construction stage landscape impacts (in Section 10.5.1.2) and include, but is not limited to:

- HGVs transporting materials to and from the site;
- Movement of heavy earth-moving machinery and the erection of several tall tower cranes on-site;
- Temporary storage of excavated materials and construction materials on-site;
- Gradual emergence of the proposed blocks, and associated works;
- Security fencing and site lighting

Overall, such Construction Phase visual impacts will be short-term in duration and not likely to be generate any significant visual impacts.

Operational Phase:

The assessment of Operational Phase visual impacts at each of the selected viewpoints is aided by 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 all proposed works

Please note that that there are 22 photomontages assessed below, from 21 selected viewpoints. This is because VP10 and VP22 are from the one selected viewpoint, with VP10 more reflective of a tighter angle in its viewing arc, while VP22 is a panoramic reflecting a 180° viewing arc. This has been undertaken out of an abundance of caution, as the viewpoint location is from along the main Avenue of St. Anne's Park, at a location close to the site's southern boundary.

Also please note that for the below purposes, the 'site boundary' refers to the developable area in which the proposed blocks are located (i.e., as opposed to the access road 'arm' extending westwards to connect with Sybil Hill).

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP1	Furry Park Road	500m	E/NE

Representative of:

- Local community views

Receptor **Medium-low**

Sensitivity

Existing View By way of context, this location is from the heart of intensely residential streets to the west of Sybil Hill. The east-west axis of Furry Park road is laid out upon a similar axis to the Main Avenue of St. Anne's Park; an axis that has the most potential for views in the direction of the site.

Visual Impact of proposed development Owing to intervening houses, no views of the Proposed Development will be attainable from this location.

Consequently, the magnitude of visual impact is deemed to be **Negligible** and of a **Neutral** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Medium-low	Negligible/neutral	Imperceptible/ Neutral

Viewshed Reference Point	Viewing distance to site boundary	Direction of View
VP2 Sybil Hill at entrance to Sacred Heart Nursing Home	178m	E/NE

- Representative of:**
- Local community views
 - Major route (i.e., R808/Sybil Hill)

Receptor Sensitivity **Medium-low**

Existing View By way of context, this location is from the western side of the northern end of Sybil Hill, at the entrance to the five-storey Sacred Heart Nursing Home, which runs for north-south for over 150m. Across the road is the entrance to Sybil Hill House, a protected structure owned by St. Pauls College in which some members of the Vincentian Order live. Behind a low brick wall and railing, a school ground replete with multiple mature trees is apparent. From this distance, the grounds appear planted/re-planted in the mid-20th Century, owing to the prominence of certain conifer non-natives. Little else can be discerned beyond these trees, which stretch with lawn areas for approx. 170m eastwards from Sybil Hill.

Visual Impact of proposed development The existing, single lane private entrance will be considerably widened to accommodate a two-way traffic public road with footpaths to either side, connecting the development to Sybil Hill; the only vehicular entrance that will access the Proposed Development. Aside from footpaths and cycle lanes, street planting to either side of this new access road will be apparent. Approx. 200m away, a four/five storey residential block will be largely screened by intervening vegetation. In the context of an inner suburb of a European capital city, as well as the

northern end of Sybil Hill, the proposed block will be highly unlikely to draw attention to itself and even if observed, will not markedly detract from the visual amenity of the scene. However, the increase of intensity of built environment will be a readily-noticeable element made more manifest by the proximity and presence of the new access road/footpath/cycle path in the foreground.

Consequently, the magnitude of visual impact is deemed to be **Medium-low** and of a **Negative** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Impact Significance	Medium-low	Medium-low/negative	Slight/ Negative

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP3	Entrance to St. Paul's College	206m	East

Representative of:

- Local community views
- Major route (i.e., R808/Sybil Hill)

Receptor Sensitivity **Medium-low**

Existing View By way of context, this location along Sybil Hill is located approx. 40m north of the entrance to the Main Avenue of St. Anne's Park. On the eastern side of the road, one of two entrance into St. Paul's College is clearly visible, framed between roadside trees to either side. Although relatively largely in area, the school's red brick, two-storey 1950s buildings tie in with the foreground wall and piers. Beyond the school buildings, little can be discerned.

Visual Impact of proposed development Owing to the aforementioned school buildings, the only elements of the proposal that will be capable of being discerned is the modest roof outline of one of the proposed blocks, more than 200m away. However, even if noticed, the proposal would not detract from the suburban visual amenity of the scene, especially in light of there being the five-storey Sacred Heart Nursing Home aligning the western side of this road (i.e., across the road from St. Paul's College).

Consequently, the magnitude of visual impact is deemed to be **Negligible** and of a **Neutral** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Impact Significance	Medium-low	Negligible/neutral	Imperceptible/ Neutral

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP4	Sybil Hill at playing pitches of St. Anne's Park	283m	NE

Representative of:

- Local community views
- Major route (i.e., R808/Sybil Hill)

Receptor Sensitivity **Medium-low**

Existing View Sybil Hill extends for approx. 700m, from Vernon Avenue in the south to the junction with Howth Road/R015 in the north. For over 300m of this road, St. Anne's Park aligns the eastern side. For almost all of that section, a 4-5-foot-high hedge aligns the park's western boundary, behind which a row of mature and semi-mature trees is set. It is only through this fragmented and narrow envelope of visibility - above the

hedge and beneath the branches of the trees - that allows for views into the park. From this and similar locations along this section of the park, all that be discerned of St. Anne's is extensive, ostensibly flat, playing pitches, bound by distant mature trees. In this instance, the tall, mature, evergreen trees on the far (i.e., north) side of the playing pitches are those aligning the southern side of the Main Avenue.

Visual Impact of proposed development Owing to the aforementioned tall, mature, evergreen trees aligning the southern side of the Main Avenue, no views of the Proposed Development will be attainable from this location.

Consequently, the magnitude of visual impact is deemed to be **Negligible** and of a **Neutral** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

Impact Significance	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
		Medium-low	Negligible/neutral

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP5	Ennafort Road, Harmonstown	296m	S/SE

Representative of:

- Local community views

Receptor Sensitivity **Medium-low**

Existing View Harmonstown is a densely residential locality within 200m north of the site. Less than 300m from the site and on marginally elevated terrain, a junction with Ennafort Road allows for the most potential of views in the direction of the site from Harmonstown. Two-storey residences align the

road, while beyond these, mature trees can be discerned, which align Howth Road/R015.

Visual Impact of proposed development A distant, bare-discernible corner of one of the proposed blocks will be capable of being made out from this this location, although will be unlikely to be noticeable in a built-up suburban setting as this. Thus, even if observed, it will have no bearing upon the visual amenity of the setting. Owing to the aforementioned trees and houses, the overwhelming majority of views of the Proposed Development will not be attainable from this location.

Consequently, the magnitude of visual impact is deemed to be **Negligible** and of a **Neutral** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

Impact Significance	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
	Medium-low	Negligible/neutral	Imperceptible/ Neutral

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP6	Howth Road/R105 at St. Anne's Park	105m	S/SE

Representative of:

- Local community views
- Major route (i.e. Howth Road/R105)

Receptor Sensitivity **Medium-low**

Existing View By way of context, Howth Road is a busy regional road that is one of the main throughfares between coastal north Dublin (e.g., Clontarf, Raheny, Kilbarrack, Baldoyle, Sutton, Howth) and the city centre.

Between Raheny and Killester, for approx. 200m the road aligns the north-western section of St. Anne's Park. Similar to Sybil Hill, a 4-5-foot-high hedge aligns the park's boundary, behind which a row of mature and semi-mature trees is set. It is only through this fragmented and narrow envelope of visibility - above the hedge and beneath the branches of the trees - that allows for views into the park. Where partial visibility does allow, a distant mature treeline can be discerned, which serves as the northern boundary of the site, over 100m away. The site is at an oblique angle to road and footpath users, while residents along the north side of the road do not have as much (partial) visibility in the direction of the site, owing to the foreground tree canopies.

Visual Impact of proposed development More than 200m away and outside St. Anne's Park, the upper storey of a five/six storey proposed residential block is discernible above the mature treeline aligning the site's northern boundary. Of what can be discerned of the proposed block will read as a contemporary multi-storey apartment complex that can be regularly seen about this city, and the proposed building's scale, form, text or tone may not be noticed by a casual observer. The Proposed Development will represent an escalation in the height of all visible buildings in this scene, but will certainly not be visually dominant or overbearing. Even if observed, it will be in a residential, suburban context, and would not have a marked effect of the visual amenity of this setting.

Consequently, the magnitude of visual impact is deemed to be **Low** and of a **Negative** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Medium-low	Low/negative	Slight/ Negative

Viewshed Reference Point	Viewing distance to site boundary	Direction of View
VP7/7a The Meadows	53m	E/SE

Representative of:

- Local community views

Receptor **Medium-low**

Sensitivity

Existing View Less than 200m in length, The Meadows is a *cul de sac* residential street off Howth Road, sections of which align the north-west site boundary. Detached, two-storey residences are dominant on this street. At the south-eastern side of the road, residences back onto the site boundary. In this scene, set within a small green near the terminus of the road, along the eastern side of the road numerous such residences are aligned. It is very much a standard, suburban residential scene, albeit with numerous notably tall trees to the rear of the properties; trees that are located within the site (i.e., outside St. Anne's Park). It is also worth noting that the recently constructed 4-5 storey Ardilaun Court is located to the rear of properties on the western side of this road.

Visual Impact of proposed development In select, highly-localised glimpses between the gaps in the roofline of the foreground residences, a proposed residential block will be discerned behind the aforementioned tall trees, while outside St. Anne's Park. However, the vast majority of the proposed residential block, including its roofline, will not be visible from this location. Where partially visibility will allow, the Proposed Development will be evident as an appropriately scaled piece of contemporary multi-storey residential block that is routinely found within the ever-evolving suburbs of Dublin.

The Proposed Development will represent an intensification in height of all visible buildings in this scene, but will not be visually dominant or overbearing. For the most part, the roofline of the foreground residences will remain more apparent, while the existing trees in the site will tower over both the proposed block and the foreground residences, helping maintain a semi-sylvan character to this vista. The proposal will alter the available vista to a minor extent and will not have a palpable effect on the visual amenity of the scene. In addition, it will partially counter the 4-5 storey Ardilaun Court that aligns the western side of The Meadows. However, it is worth noting that the degree of enclosure generated by the proposed blocks will be greater for those residences along The Meadows that back onto the site. Consequently, the likely impact upon the residential visual amenity of these residences will also be higher.

Consequently, the magnitude of visual impact is deemed to be **Low** and of a **Negative** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Impact Significance	Medium-low	Low/negative	Slight/negative

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP8/8a	Sybil Hill House	106m	NE/E/SE

Representative of:

- Heritage & Amenity feature

Receptor Sensitivity **Medium-low**

Existing View By way of context, Sybil Hill House, which has been owned by St. Pauls College since the 1950s is a protected structure from the 1750s, with a small section of its original ha-ha surviving to the south of the property (i.e., partially visible in foreground). However, it is worth re-iterating that the House, like all else within the grounds of St. Pauls, is and always has been in private property and not accessible to the public; factors that also inform the visual sensitivity of the receptor. In that regard, this is a less typical LVIA/TVIA receptor, as this location is not in the public sphere. A thicket of mature trees is located to the southeast of the House, beyond which (i.e., further east) is the developable area of the site.

Immediately south of the House is the two-storey, mid-20th Century, red brick campus of St. Paul's college, with a row of non-native prunus trees visible to its north. A grassy corridor between the school building and the ha-ha is evident in the foreground, though little can be discerned beyond, owing to mature vegetation. This grassy corridor is

within the western 'arm' of the site and is hence cordoned off with temporary fencing.

Visual Impact of Proposed Development

To the northeast, north of the ha-ha, the proposed blocks will be challenging to discern, owing to the scale of existing mature trees in tandem with Sybil Hill House. However, a low brick wall with ornate black railing will run between the site and Sybil Hill House; fencing that will reflect and respect this protected, period property. To the east, owing to the clearance of some existing trees to facilitate the new access road into the site, partial views of the proposed blocks will open up. However, at this location, these moderately scaled, four/five storey residential blocks in the site will be more than 200m away.

Where visible, the Proposed Development will be evident as an appropriately scaled, suitably finished piece of contemporary multi-storey architecture. The proposal will add to the intensity and scale of built development within the scene, while suggesting a contemporary/21st Century architectural presence that was not previously as palpable. Furthermore, it's deep red, brick-like tones will appear compatible with the foreground St. Paul's College and its height and form will not attract attention to itself.

The foreground access road, however, will introduce a considerably more tenable and immediate visual change to this scene. The proposed clearance of some trees along this section of the site will be in order to facilitate the proposed access road; tempered by the proposed planting of a hedge along the southern side of the road, among other measures. In addition, such visual change is not tantamount to visual impact: such a road, footpath, cyclepath and attendant planting are routine sights across the study area and the city, and are integral elements of such highly functional residential suburbs as this. In addition, the scheme will present an array of high-end, contemporary landscape design that will generate a source of visual amenity in its own right.

On balance, the magnitude of visual impact is deemed to be **Medium-low** and of a **Negative** quality.

Summary

Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

Visual Receptor Sensitivity	Visual Magnitude	Impact	Significance of Visual Impact
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Impact Significance	Medium-low	Medium-low/negative	Moderate-slight/ Negative
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Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP9/9a	Schoolyard of St. Paul's College	142m	NE/E

Representative of:

- Heritage & Amenity feature

Receptor **Medium-low**

Sensitivity

Existing View St. Paul's College is a large, secondary boy's school located on Sybil Hill since 1950. In recent years, the site lands were sold by St. Paul's for the expressed purposes of development, in fitting with the zoning of the site lands. In that regard, this is a less typical LVIA/TVIA receptor, as this location is not in the public sphere but within private property. A large schoolyard to the rear of the school, and attendant single storey buildings/structures, are apparent in the foreground of this scene, as is a modest sized, floodlit all weather sporting pitch/ground to the immediate south-east.

Beyond the schoolyard wall, a playing pitch that has been retained for use by the school can be discerned, on the far side of the which (i.e., over 150m away) blue hoarding can be glimpsed, which marks the site boundary. On the eastern and southern side of the site, large mature treelines are visible from this location, which serve to partially 'hem in' the site from the adjacent St. Anne's Park.

Visual Impact of Proposed Development Over 150m away, several 4-6 storey residential blocks will be clearly seen from this location, with the southernmost, paler-toned block being a nursing home and creche. This Proposed Development would offer a distinct visual change and strong sense of enclosure; while it will be visually co-dominant from this location, it will not appear overbearing, especially in the context of the built-up, northern end of Sybil Hill. The Proposed Development will add considerably to the intensity and scale

of built development within the scene but will also be discerned as a fitting sample of modern-day multi-storey urban design within a deeply residential suburb. Furthermore, its brick-like tones will appear compatible with the buildings within St. Paul's College.

However, the Proposed Development will also represent the loss of a more open, greenfield aesthetic that is discernible from this viewpoint, even when not accessible. Given the scale of the proposed building, the design achieves an appreciable integration with the surrounding sylvan setting. Be that as it may, the Proposed Development will be one of the most noticeable elements in the scene and will also read as several large buildings replacing a former grassy, greenfield site, thereby reducing the visual amenity of the scene.

Consequently, the magnitude of visual impact is deemed to be **Medium** and of a **Negative** quality.

Summary

Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

Impact Significance

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Medium-low	Medium/negligible	Moderate/ Negative

Viewshed Reference Point	Viewing distance to site boundary	Direction of View	
VP10/10a/22	St. Anne's Main Avenue adjacent to site	18m	NW/N/NE

- Local community views
- Heritage & Amenity feature

Representative of:

Receptor Medium

Sensitivity

Existing View

By way of context, the perfectly straight, near 1.5km-long Main Avenue of St. Anne's Park once connected the formal park entrance to St. Anne's House and was planted in the late 19th Century with an alternating layout of Evergreen Oak and Scot's Pine. These large, densely-planted evergreen trees now align the southern boundary of the site and are a distinctive feature of the park all year round, channelling views east/west, with limited visibility of features north or south of the avenue. Consequently, this viewpoint location was selected as it allows the most attainable - albeit fragmented and partial - views of the site from the Main Avenue. The Avenue is hugely popular with walkers and runners, in particular, passing between Sybil Hill and the more aesthetic, historic core of the Park.

Between and behind relatively bare branches at the base of a large pine tree, a paladin fence can be seen, which marks the southern boundary of the site. The fence is partially overgrown with creepers and briars, making views into the site more challenging. From what can be discerned of the site, fragments of a distant mature treeline be spied, in places. Otherwise, all that can be determined is that the site appears to be an open, greenfield nature.

Visual Impact of proposed development

Behind the foreground trees and paladin fence, past a formal exercise area and approx. 50m north of the Main Avenue, the upper two floors of the proposed four-storey nursing home will be capable of being partially made out from this location, between intervening proposed trees within the site and the existing mature trees north of the Main Avenue. While the overwhelming majority of the proposal will not be visible from this location, where partially visible, the proposed development will read as a large building replacing a former open, greenfield site. Overall, it will modestly accelerate a sense of enclosure and marginally reduce the visual amenity of the scene.

However, it is worth reiterating that views into the site are peripheral to those park goers along the Main Avenue, where views are overwhelmingly channelled east-west, and that the site of the Proposed Development will remain cordoned-off private property outside St. Anne's Park.

Consequently, the magnitude of visual impact is deemed to be **Low** and of a **Negative** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Impact Significance	Medium	Low/negative	Slight/negative

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP11	St. Anne's playing pitches south of site	285m	N

Representative of:

- Local community views
- Heritage & Amenity feature

Receptor Sensitivity **Medium**

Existing View This scene is from one of over 20 playing pitches in the western half of St. Anne's Park, and is positioned at the southern end of the pitches to allow for the most likely potential views of the Proposed Development. At the far/northern end of the pitches is a tall evergreen double treeline along the Main Avenue.

Visual Impact of proposed development Owing to the aforementioned trees, no views of the Proposed Development outside St. Anne's Park will be attainable from this location.

Consequently, the magnitude of visual impact is deemed to be **Negligible** and of a **Neutral** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Medium	Negligible/neutral	Imperceptible/ Neutral

Viewshed Reference Point	Viewing distance to site boundary	Direction of View
VP12 Mount Prospect Avenue	606m	N

Representative of:

- Local community views

Receptor Sensitivity **Medium-low**

Existing View By way of context, this location is along the much-used Mount Prospect Avenue, at the junction of Mount Prospect Lawns. Mount Prospect Lawns is a short, straight residential *cul de sac* that runs north-south, thereby presenting the strongest likelihood of views towards the site from the residential streets of Clontarf, to the immediate south of St. Anne's Park. There are multiple residences aligning Mount Prospect Lawns, including Belgrove Park, consisting of multiple 3-4 storey residential blocks, which aligns the southern boundary of the Park.

Visual Impact of proposed development Owing to the aforementioned residences, no views of the Proposed Development will be attainable from this location.

Consequently, the magnitude of visual impact is deemed to be **Negligible** and of a **Neutral** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

Impact Significance	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
	Medium-low	Negligible/neutral	Imperceptible/ Neutral

Viewshed Reference Point	Viewing distance to site boundary	Direction of View
VP13/13a All Saints Road north of site	140m	S/SW

- Local community views

Representative of:

Receptor Sensitivity **Medium-low**

Existing View All Saints Road aligns the northern side of St. Anne's Park and at this location is within 150m north of the site boundary. There is a line of south-facing residences along this road, as well as numerous residential streets further north. Within the northern boundary of St. Anne's Park, there is a mature thicket of trees, approx. 20m in width, which tends to preclude views further south into the park and in the direction of the park.

Visual Impact of proposed development Owing primarily to the aforementioned thicket of trees, no views of the Proposed Development will be attainable from this location.

Consequently, the magnitude of visual impact is deemed to be **Negligible** and of a **Neutral** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

Impact Significance	Visual Receptor	Visual Impact	Significance of Visual Impact
	Medium-low	Negligible/neutral	Imperceptible/ Neutral

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP14	Path near south-eastern corner of the site	5m	NW

Representative of:

- Local community views
- Heritage & Amenity feature

Receptor Sensitivity **Medium**

Existing View Outside the eastern boundary of the site, a treelined public pathway connects the Main Avenue of the Park with All Saints Road, over the course of almost 400m. Although less than 10m from the eastern boundary, views into the site from this path are rare, owing to a multitude of mature trees and shrubs in an 8-10m wide thicket, while to the east of the path is the Millennium Arboretum. However, at one specific location by the southeast corner of the site, and at an obscure angle to path users, there is a dearth of intervening vegetation, which allows for views of the site.

The foreground site boundary takes the form of a paladin fence while the site itself appears as a large, relatively flat, fallow, open, greenfield site. Blue (temporary) wooden hoarding aligns the site's western boundary, above which the more distant five-storey Sacred Heart Nursing Home on Sybil Hill can be discerned, as can the mature treeline that runs outside the site's northern boundary.

Visual Impact of proposed Inside the boundary fence and outside St. Anne's Park, a formal hedgerow will preclude the overwhelming majority of the Proposed

development

Development. The proposed hedge is very similar those found throughout the adjacent St. Anne's Park and about the study area, and is unlikely to be noticed. Inside/past the hedge, all that is likely to be discerned about the proposal is the uppermost floor of the paler-toned, four-storey nursing home and five-storey residential blocks north of it. It is worth noting that these proposed buildings will be set back approx. 75m from the eastern site boundary. The proposal will increase the scale and intensity of built development in what had been an open, greenfield site, with a visual context made more acute by the viewer being within a public park.

Although the proposal - including the foreground hedge - will be visible, it will not appear overbearing but a broader and compatible extension of the built development across the northern end of Sybil Hill. The tonal varieties of the nursing home at the south of the development will broadly complement that of the deep red of the proposed residential blocks to its north. However, while outside St. Anne's Park, the proposed foreground hedgerow will largely cut-off a source of open, greenfield amenity, thereby reducing the inherent visual amenity of the scene; a point that needs to be tempered with the fact that for the park user (i.e. visual receptor, in this instance) almost 100 hectares of open, greenfield amenity within St. Anne's Park will remain unaffected/unaltered by the Proposed Development.

Consequently, the magnitude of visual impact is deemed to be **Medium** and of a **negative** quality.

Summary

Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

Impact Significance

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Medium	Medium-low/ negative	Moderate-slight/ negative

Viewshed Reference Point	Viewing distance to site boundary	Direction of View

VP15	All Saints Road northeast of site	245m	SW
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- Local community views

Representative of:

Receptor **Medium-low**

Sensitivity

Existing View This location along All Saints Road is further to the northeast, between the junctions of Bettystown Avenue and Waterfall Road. There is a line of south-facing residences along this section of the road, as well as numerous residential streets further north. Within the northern boundary of St. Anne's Park, the Millennium Arboretum has been extended near this location, forming a deep woodland that precludes views further south into the park and in the direction of the park.

Visual Impact of proposed development Owing to the aforementioned trees, no views of the Proposed Development will be attainable from this location.

Consequently, the magnitude of visual impact is deemed to be **Negligible** and of a **Neutral** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

Visual Receptor Sensitivity	Visual Magnitude	Impact	Significance of Visual Impact
Medium-low	Negligible/neutral		Imperceptible/ Neutral

Impact Significance

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP16	St. Anne's playing pitches east of site	151m	W

Representative of:

- Local community views
- Heritage & Amenity feature

Receptor **Medium**
Sensitivity

Existing View This scene is from one of over 20 playing pitches in the western half of St. Anne's Park, and is positioned at the eastern end of the pitches to allow for the most likely potential views of the Proposed Development. At the far/western end of the pitches is thick, mature 8-10m wide thicket of trees that align the eastern boundary of the site.

Visual Impact of proposed development Owing to the aforementioned trees, views of the overwhelming majority of the Proposed Development will not be attainable from this location. Rather, partial views of the top floor of two different, brick-toned five-storey residential blocks will be partially visible above the distant treeline, as well as most of the top two floors of the light-toned six-storey block to the north. The visual presence of the Proposed Development will derive partly from distance over scale, the existing mature trees within the park, and between the site and this location, as well as the roofline of the proposed buildings punctuating the skyline.

Of what can be discerned of the proposed blocks will read as a contemporary multi-storey apartment complex located outside St. Anne's Park; apartments that can be regularly seen about this city. In terms of aesthetics, the alteration of tone in the buildings reduces the potential for perceived 'massing' of the blocks. The Proposed Development will, thus, represent the only visible buildings from this location, but will certainly not be visually dominant or overbearing.

Consequently, the magnitude of visual impact is deemed to be **Medium-low** and of a **Negative** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

Impact Significance	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
	Medium	Medium-low/negative	Moderate-slight/ Negative

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP17	St. Anne's Park Main Avenue	193m	NW

Representative of:

- Local community views
- Heritage & Amenity feature

Receptor Sensitivity **Medium**

Existing View By way of context, the perfectly straight, near 1.5km-long Main Avenue of St. Anne's Park once connected the formal park entrance to St. Anne's House and was planted in the late 19th Century with an alternating layout of Evergreen Oak and Scot's Pine. These large, densely-planted evergreen trees now align the southern boundary of the site and are a distinctive feature of the park all year round, channelling views east/west, with limited visibility of features north or south of the avenue. Consequently, this viewpoint location was selected as it allows the most attainable - albeit fragmented and partial - views of the site from the Main Avenue. The Avenue is hugely popular with walkers and runners, in particular, passing between Sybil Hill and the more aesthetic, historic core of the Park.

In this scene, located almost 200m east of the site, the two aforementioned tall, thick treelines marshal views towards the indeterminate entrance of the avenue, with little of the land use off the avenue being able to be determined.

Visual Impact of proposed development Owing to the aforementioned trees, no views of the Proposed Development will be attainable from this location.

Consequently, the magnitude of visual impact is deemed to be **Negligible** and of a **Neutral** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Impact Significance	Medium	Negligible/neutral	Imperceptible/ Neutral

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP18	St. Anne's Tennis Club	469m	SW

Representative of:

- Local community views
- Heritage & Amenity Feature

Receptor Sensitivity **Medium**

Existing View By way of context, St. Anne's Tennis Club is a popular, public 12-court tennis club located off All Saints Road. To its immediate west, over 300m of the Millennium Arboretum between this location and the site is located.

Visual Impact of proposed development Owing to the aforementioned trees, no views of the Proposed Development will be attainable from this location.

Consequently, the magnitude of visual impact is deemed to be **Negligible** and of a **Neutral** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Impact Significance	Medium	Negligible/neutral	Imperceptible/ Neutral

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP19	Mount Prospect Avenue at Clontarf GAA pitches	500m	NW

Representative of:

- Local community views
- Heritage & Amenity feature

Receptor Sensitivity **Medium**

Existing View By way of context, for several hundred metres along the eastern end of Mount Prospect Avenue, it aligns St. Anne's Park. Views in the direction of the site are largely curtailed by roadside trees, but in this instance a gap above a 4-5-foot-high footpath-side hedge and between foreground trees, allows for more extensive views. The pitches of Clontarf GAA Club can be clearly seen in the foreground, beyond which a visually impenetrable tall treeline is evident.

Visual Impact of proposed development Owing to the aforementioned trees, no views of the Proposed Development will be attainable from this location.

Consequently, the magnitude of visual impact is deemed to be **Negligible** and of a **Neutral** quality.

Summary

Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

**Impact
 Significance**

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Medium	Negligible/neutral	Imperceptible/ Neutral

Viewshed Reference Point	Viewing distance to site boundary	Direction of View
VP20 St. Anne's Walled Garden	841m	

Representative of:

- Local community views
- Heritage & Amenity feature

Receptor

Medium

Sensitivity

Existing View

By way of context, this location is from within the original, Victorian walled garden in St. Anne's Park and one of the 'iconic' features of the Park's historic core. Approx. 800m east of the site, the walled garden holds a 12 acre (4.9 ha) plant nursery for the Dublin City Parks Department, producing thousands of bedding plants, shrubs, trees and floral tubs annually.

In this scene, bedding plants and hedgerows are aligned in a formal fashion, terminating in tall trees found within the 9-hole golf course and the Millennium Arboretum, outside the walled garden.

Visual Impact of proposed development Owing to the aforementioned trees, no views of the Proposed Development will be attainable from this location.

Consequently, the magnitude of visual impact is deemed to be **Negligible** and of a **Neutral** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Impact Significance	Medium	Negligible/neutral	Imperceptible/ Neutral

Viewshed Reference Point		Viewing distance to site boundary	Direction of View
VP21	Park entrance to Main Avenue	225m	NE

Representative of:

- Local community views
- Heritage & amenity feature

Receptor Sensitivity **Medium**

Existing View By way of context, this is a major park entrance, located at the western end of the Main Avenue at its junction with Sybil Hill and beside the southern boundary of St. Pauls school. The perfectly straight, near 1.5km-long Main Avenue of St. Anne's Park once connected the formal park entrance to St. Anne's House and was planted in the late 19th Century with an alternating layout of Evergreen Oak and Scot's Pine.

These large, densely-planted evergreen trees now align the southern boundary of the site and are a distinctive feature of the park all year round, channelling views east/west, with limited visibility of features north or south of the avenue. Consequently, this viewpoint location was selected as it allows the most attainable - albeit fragmented and partial - views of the site from the Main Avenue. The Avenue is hugely popular with walkers and runners, in particular, passing between Sybil Hill and the more aesthetic, historic core of the Park.

In this scene, over 200m southwest of the site, the aforementioned tall, thick treelines marshal views along the avenue, with little of the land use off the avenue being able to be determined.

Visual Impact of proposed development Owing to the aforementioned trees, no views of the Proposed Development will be attainable from this location.

Consequently, the magnitude of visual impact is deemed to be **Negligible** and of a **Neutral** quality.

Summary Based on the assessment criteria and matrices outlined at **Section 10.2** the significance of residual visual impact is summarised below.

	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact
Impact Significance	Medium	Negligible/neutral	Imperceptible/ Neutral

10.5.3 Cumulative Impact

In terms of the potential cumulative impact upon the landscape character of the receiving environment, the proposed construction of 7 no. permanent blocks ranging in height from 4 to 7 storeys will represent a clear escalation of built intensity within 200m of the site, as well as a distinct vertical imprint into what had been mostly a grassy, greenfield site. In that regard, the site's development will be broadly consistent with the northern end of Sybil Hill, where two such multi-storey developments are located, as well as the St. Paul's College campus aligning the site, while also intensifying that landscape character. It will also intensify the strong residential character of the study area.

In terms of the potential cumulative visual impact, it is firstly worth noting that combined visibility occurs where the observer is able to see two or more developments from one viewpoint. As the nature of the development, in this instance, entails buildings, combined visibility may either be:

- In combination (i.e., more than one such block is within the observer's viewing arc at the same time without moving his/her head);
- In succession (i.e., where the observer has to turn his/her head to see various blocks).

However, it is also worth noting that if the visual impact significance from any receptors has been deemed to Imperceptible in its own right, then it has no potential to generate any cumulative impact; that is, if the proposed development is likely to generate an imperceptible visual impact, then when combined with any other developments its cumulative visual impact will, too, be equally negligible.

Please note that an extensive list of other developments granted planning permission in the study area, which could have a potential cumulative impact, was prepared in advance of this cumulative impact assessment. Based on a criterion of having combined visibility of at least one other building (of two storeys or more), of the 21 no. receptors selected for this assessment:

- Two receptors have the potential to be viewed in combination (i.e., VP7 & VP8);
- Three receptors have the potential to be viewed in succession (i.e., VP2, VP6 & VP9).

Thus, overall, potential cumulative visibility is likely to arise in less than one-quarter of receptors (i.e., 5 out of 21), and that none of these are from with St. Anne's Park.

For the reasons outlined above, the magnitude of cumulative effects is deemed to be **Low**. Thus, significant cumulative impacts are not considered to occur.

10.5.4 Overall Significance of Impact

Overall, it is considered that the Proposed Development is an appropriate contribution to the built fabric of this suburb that will not result in any significant landscape/townscape or visual impacts.

10.6 Mitigation Measures

10.6.1 Construction Phase

A site hoarding will be erected at the commencement of construction for numerous safety and amenity reasons. One of the key landscape and visual benefits of this will be the screening of early stage ground works and ground-based activity throughout the course of the construction phase. There are no specific landscape and visual mitigation otherwise proposed during the construction phase.

10.6.2 Operational Phase

Specific landscape and visual mitigation measures are not considered necessary for the operational stage development. Instead, mitigation measures can be considered to be embedded into the multi-faceted design of the Proposed Development during the operational phase, particularly the landscape design, which will help to assimilate the built elements of the development and complement the parkland character of the surroundings.

10.7 Residual Impacts

Residual Impacts are defined as *'effects that are predicted to remain after all assessments and mitigation measures'*. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

Residual impacts have been assessed based on the assessment criteria and matrices outlined at Section 10.2. Full details are outlined in Section 10.5.2.2 of this EIAR.

10.8 Monitoring

10.8.1 Construction Phase

No monitoring is required during the construction phase, with regards to this Landscape/ townscape Visual Impact Assessment.

10.8.2 Operational Phase

No monitoring is required during the operational phase, with regards to this Landscape/ townscape Visual Impact Assessment.

10.9 Interactions

The main interactions with the townscape and visual impact assessment include, Architectural Design, Landscape Design, Archaeology and Cultural Heritage, Planning and Biodiversity.

10.9.1 Archaeology and Cultural Heritage

As there are no known archaeological or architectural remains found during the desk top survey as well as the walkover survey, it is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.

10.9.2 Biodiversity

The landscaping proposed for the Site entails the planting of over 700 trees, many of which are native species. This increase in tree cover across the Site will provide additional nesting/foraging resources for local passerines, along with a slight increase in habitat connectivity over what is currently open field habitat.

10.9.3 Population and Human Health

The Proposed Development will alter the visual appearance of the Site which is predominantly a greenfield Site. It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the Site of the Proposed Development and the rural and residential nature of the surrounding landscape, will cause any significant impacts for the residential local population.

10.10 Difficulties Encountered When Compiling

No particular difficulties were encountered when compiling the information for this project.

10.11 References

Dublin City Development Plan 2016-2022;

'Guidelines for Landscape and Visual Impact Assessment' (GLVIA-2013)(Third Edition) by the Landscape Institute and Institute of Environmental Management & Assessment (UK);

Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018), published by the Department of Housing, Planning and Local Government;

Environmental Protection Agency 'Guidelines on the information to be contained in Environmental Impact Assessment Chapter of the EIARs' May 2022.

11 ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE

11.1 Introduction

This chapter of the environmental impact assessment report pertains to the potential impact of the Proposed Large Residential Development (hereafter referred to as the Proposed Development) on the archaeological, architectural and cultural heritage of the receiving environment at the Foxlands, Raheny site, comprising the lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5. The archaeological and cultural heritage elements have been carried out by James Kyle BSc HDip MIAI of Archaeology and Built Heritage Ltd. James holds a Bachelor of Science degree in Zoology with Marine Zoology from the University of Wales and a postgraduate Higher Diploma in Irish Archaeology from University College Cork. James has extensive experience managing the archaeological aspects of major infrastructural, commercial and residential projects in both the public and private sectors. He is the Chairperson of the Institute of Archaeologists of Ireland (IAI) and also the Chairperson of the Archaeological Branch of Unite the Union. He is also a member of the European Association of Archaeologists. The architectural elements of this study have been carried out by Rob Goodbody, Historic Building Consultant with IAC Archaeology. Rob has a post-graduate diploma in Environmental Planning and a Masters in Urban Building Conservation from UCD. He has thirty years' experience as a professional planner.

The main purpose of the impact assessment report is to assess the potential significance and sensitivity of the existing archaeological, architectural and cultural heritage receiving environment (the baseline), and in turn to evaluate the likely and significant impacts of the Proposed Development on this environment. Ameliorative (remedial or reductive) and case appropriate mitigation measures are proposed, where necessary, to safeguard any monuments, features or finds of antiquity or features of local cultural heritage interest that have been identified during the course of these studies.

The application site consists of a substantial L-shaped area of land, together with a narrower strip that runs westward to provide for access to Sybil Hill Road and ancillary strips to allow for other works such as surface water drainage and improvement to the access. The site is adjacent to the grounds of Sybil Hill House, which is a protected structure. The main part of the site is bounded on three sides by St Anne's Park, which is a conservation area – though not an architectural conservation area.

It is proposed to provide 580 apartments, a nursing home and a crèche on the site, comprised of seven blocks ranging in height from four to seven storeys. The development will also include residential tenant amenity spaces, a basement-level car and cycle park with storage, services and plant. The existing access to Sybil Hill Road would be widened and realigned and an access road is to be provided connecting between Sybil Hill Road and the site, necessitating the demolition of an existing prefabricated building.

The proposed access road will run close to the buildings at St Paul's College, to the south of Sybil Hill House and will be separated from the house and grounds of Sybil Hill House by the grounds to the front of the house. Sybil Hill House is a protected structure, though It is not anticipated that the access road would have any significant impact on the house or its setting.

The area proposed for housing is to the rear of Sybil Hill House and separated from it by trees and outbuildings. The nearest building would be about seventy metres from the rear of Sybil Hill House. It is not anticipated that the Proposed Development would have any significant impact on the character of the house.

The application site is bounded by St Anne's Park on the northern, eastern and southern sides. The margin of the park is marked by a belt of trees that runs along all three sides adjacent to the application site. On the southern side a substantial avenue runs through the park, from a gateway on Sybil Hill Road towards the east and this is bounded by substantial trees. It is proposed to locate open space on the site near to this boundary. The part of the park to the east of the site is partly taken up with playing pitches and partly with the Millennium Arboretum. To the north of the site there are more playing pitches in the park. The upper part of the proposed apartments will be visible from the playing pitches, but not to the extent that they would have a significant impact on the character of the park.

11.1.1 Archaeological and Cultural heritage

Archaeological heritage is a finite non-renewable physical and material resource, where archaeology is defined as the study of past human societies through their material remains and artefactual assemblages. The study of archaeological remains increases our understanding of the structure and culture of past societies that are not recorded by any other means. Each monument or site possesses a unique and, as such, invaluable record of the individual site, as well as providing evidence for its context in a wider cultural framework. Collectively, archaeological monuments contribute to charting cultural evolution and societal change throughout human history.

Archaeological heritage includes all remains and objects and any other traces of humankind from the past, the preservation and study of which helps to retrace the history of humankind and our relationship with the natural environment. The archaeological heritage includes structures, constructions, groups of buildings, developed sites, moveable objects and monuments of all kinds as well as their context, whether situated on land or under water that generally pre-date AD1700. (based on the Valetta Convention 1992).

Cultural heritage is defined as a group of resources inherited from the past which people identify, independently of ownership, as a reflection and expression of their constantly evolving values, beliefs, knowledge, and traditions. It includes all aspects of the environment resulting from the interaction between people and places through time (Faro Convention). Cultural Heritage is an expression of the ways of living developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expression, and values. Cultural Heritage is often expressed as either Intangible or Tangible Cultural Heritage (ICOMOS 2002).

Cultural and Archaeological Heritage Impact Assessment is the process which leads to a systematic documentation of the cultural and archaeological heritage receptors that may be affected directly or indirectly by any given project or development; this process aims to assess the likely impacts on the receptors, the significance of the effects of those impacts; and the necessary measures to mitigate significant adverse effects on those receptors. The purpose of the impact assessment is to understand the consequences of change to the archaeological

and cultural heritage assets so that informed decisions can be made about their sustainable management.

11.2 Methodology

11.2.1 Archaeology and Cultural Heritage Assessment Methodology

The methodology undertaken in the production of the archaeology and cultural heritage elements of this chapter included a desk-based assessment of the known archaeological and settlement history of the immediate area, a walk-over site inspection and extensive research of the relevant sources pertaining to the Proposed Development site and its environs.

11.2.2 Desk-Based Assessment

The desk-based assessment made use of the following sources:

- Record of Monuments and Places (RMP) and Sites and Monuments Record (SMR)
- Topographical files of the National Museum of Ireland
- Documentary sources (as listed in the bibliography)
- Cartographical sources
- OSI Historic Mapping Archive and other historical mapping
- Aerial photographs
- Excavations Bulletin and Excavations Database (1970-2015)
- Dublin City Development Plan 2016-2022

11.2.3 Site Inspection

A walk-over inspection of the site was conducted on 31st August 2021. The purpose of the site inspection was to identify potential archaeological sites and features of historical, industrial, and cultural heritage merit that may be subject to direct or indirect impacts as a result of the Proposed Development.

11.2.4 Guidelines, Legislation and Standards

For the purposes of this report the following guidelines, legislation and standards were consulted:

- National Monuments Act, 1930 (as amended)
- The Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999
- Planning and Development Act, 2000 (as amended)
- The Heritage Act, 1995
- Environmental Protection Agency, 2015, Revised Guidelines on the information to be contained in Environmental Impact Statements, Draft September 2015
- Environmental Protection Agency, 2015, Advice Notes for preparing Environmental Impact Statements. Draft September 2015
- The Heritage Council, 2013, Historic Landscape Characterisation in Ireland: Best Practice Guidance
- Department of Arts Heritage and the Gaeltacht, 2011, Architectural Heritage Protection Guidelines for Planning Authorities

- National Roads Authority, 2010, Project Management Guidelines
- The Heritage Council, 2010, Proposals for Ireland's Landscapes
- National Roads Authority, 2006, Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes
- National Roads Authority, 2006, Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes
- Environmental Protection Agency, 2003, Advice Notes on Current Practice (in preparation of Environmental Impact Statements)
- Environmental Protection Agency, 2002, Guidelines on the information to be contained in Environmental Impact Statements
- Department of Arts, Heritage, Gaeltacht and Islands, 1999, Framework and Principles for the Protection of the Archaeological Heritage
- Department of Arts, Heritage, Gaeltacht and Islands, 1999, Policy and Guidelines on Archaeological Excavation
- Department of Arts, Heritage and the Gaeltacht, 2015, National Landscape Strategy for Ireland 2015-2025.

11.2.5 Architectural Heritage Assessment Methodology

The architectural heritage assessment examines buildings and other structures within, or close to, the application site and assesses the architectural significance of those structures with the anticipated effect of the proposed residential development on their character. The emphasis is on structures still standing. Where a building or other structure has been destroyed it no longer has architectural significance on the landscape, though it may leave traces that fall within the ambit of the archaeological assessment. It may also have had an importance that remains through the historical record, though this is not of concern to the present task. For a structure to have architectural significance it need not survive intact and ruins, or even fragments of buildings may be of importance.

The identification of buildings and structures to be assessed for impact was based in the first instance on an analysis of current Ordnance Survey maps. The potential for any building or other structure in the vicinity of the site to have special architectural significance was also gauged through examination of the following sources:

- The Dublin City Development Plan 2016-2022
- The Draft Dublin City Development Plan 2022-2028
- Pre-Ordnance Survey maps by John Rocque and John Taylor
- Ordnance Survey six-inch maps of 1843, 1871 and 1912

Any buildings on or close to the application site that were identified on the earlier Ordnance Survey maps were then checked against the current Ordnance Survey maps to ascertain which were still extant. The entries in the Records of Protected Structures for Dublin city was also checked.

Historical sources used in the study are listed in the bibliography.

The site and its vicinity were walked on 9th November 2021 to identify those structures noted in the desktop survey to assess them for their architectural quality. The possibility of finding structures of architectural significance not identified either from the desktop assessment was kept in mind during the site work and any potential additional structures were examined. The site had previously been walked on 11th November 2016, 24th May 2017, 9th May 2018 and 21st August 2019, including the grounds of the school and Sybil Hill House, which were not visited again in 2021.

The structures identified within the site or in the vicinity were examined to assess the potential effects of the Proposed Development and to consider potential for mitigation where necessary. In each case the structures identified are rated in accordance with the system adopted the National Inventory of Architectural Heritage (NIAH) wherein a structure is rated as being of International, National, Regional or Local interest, or, if a structure is of no special interest, the NIAH includes a category of "Record only"⁹. It is noted that the only structure in the vicinity of the site that was included in the NIAH is Sybil Hill House.

The legislation relating to the protection of architectural heritage is set down in the Planning and Development Act 2000, as amended, and this defines architectural heritage as including structures which are of special interest under the headings of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. Wherever the phrase "special architectural interest" is used in this report it should be taken as including special interest in any one or more of these eight categories.

In this assessment each building or structure that is considered is assigned a rating in accordance with the NIAH system or is stated to be not of special architectural interest. Where the rating is deemed to be higher than "Record only" the category of special interest is noted.

It should be noted that the term "special architectural interest" applies only in the context of this assessment of architectural heritage and does not imply that those buildings and other structures that are not considered to be of special architectural interest are in any way inferior or are of lower value.

11.3 Existing receiving environment

11.3.1 The Site

The greater part of the site is a large open area with a grass surface. This is surrounded by trees, which are outside the application site. Most of the site is bounded by a metal railing, though there are masonry walls in some areas and a temporary timber hoarding along the south-western part of the site. One of these masonry walls is a substantial brick and stone wall just inside the site's northern boundary, while the western boundary to Sybil Hill House is a high concrete-block wall. The access to the site is from Sybil Hill Road and passes between a protected structure in large, landscaped grounds at Sybil Hill, and a school built in the 1950s. There is a gateway in the eastern fence that connects to St Anne's Park, though this is normally locked at present.

⁹ National Inventory of Architectural Heritage *NIAH*

The redline boundary for the Proposed Development occupies an area of 6.7 ha, whilst the location of the Proposed Development is enclosed by the grounds of St Anne's Park to the north, east and south; by the sports grounds of St Paul's College to the south; and to the west by residential development at The Meadows, Sybil Hill House and St Paul's College. The 4-storey Convent building & grounds of the Little Sisters of the Poor is located on the opposite side (to the west of) of Sybil Hill Road. The Proposed Development site is located 1.2km externally to the Dublin City Zone of Archaeological Potential (DU015-082) which surrounds the village of Raheny. There are no monuments recorded by the statutory RMP (see above) as being located within the Proposed Development site, nor is it within the constraint zone surrounding any monument. Additionally, the only archaeological investigation on the site of the Proposed Development was the Geophysical Survey conducted by Shanarch Ltd. in September 2015, under licence ref. 15E0095.

11.3.2 Conservation context



Figure 11-1: Detail of development plan map B, with application site outlined in a broken red line. Source: Dublin City Development Plan map B, with site boundary overlaid

There are no protected structures within the application site and no part of the site lies within or adjacent to an architectural conservation area. The access to the site will run between St Paul's College and a property known as Sybil Hill House, which is occupied by the Vincentian Order. Sybil Hill House is a protected structure and is included in the Record of Protected Structures under reference 7910. It is also included in the NIAH under reference 50030086. This building is marked with a red asterisk on the extract from the Dublin City Development Plan 2016-2022, map B, which is reproduced above.

The application site is bounded on its northern, eastern and southern sides by St Anne's Park, which is designated on the development plan map as a conservation area that is not an architectural conservation area. This is depicted by red hatching on the map.

11.3.3 Archaeological and historical background with cartographic analysis

The site of the Proposed Development is located equidistantly between the villages of Raheny and Killester, on a gentle south facing slope, with expansive views through the trees of St. Anne's Park southwards to Clontarf and the Dublin Bay coastline and beyond to the panoramic

vista of the Dublin/Wicklow mountains. Running to the north and east of the Proposed Development is the Naniken River or Abhann na gCian, a derivative of the name of the clan, the Ciannacht Breg, who occupied the coastal area between Annagassan and Dublin at the dawn of the Early Medieval Period (c.500 AD) according to the historic sources.

11.3.3.1 Prehistoric Period

Mesolithic Period (Middle Stone Age c. 9000-4000BC)

The Mesolithic period currently presents the earliest evidence for the human occupation of the greater Dublin area and the surrounding coastline during the immediate post-glacial period. Although the course of the Naniken River, located to the northeast of the Proposed Development may have altered considerably over the intervening timespan, the routes of streams and rivers would have served as pathways through which the interior of the land could be accessed from the coastline, providing freshwater above their tidal reaches just as they would have provided a direct food source in their freshwater, brackish and saltwater reaches and indirectly so, via their attraction of the native fauna of the area.

The closest site dating to the Mesolithic period was the located 4km southwest of the Proposed Development at Spencer Dock, Dublin 1, where wooden fish traps dating to a period of the late Mesolithic (6100-5760 cal BC) were excavated by Melanie McQuaid (McQuade 2008, pg. 8–11). A number of shell middens and flint scatters dating to this period have been uncovered further along the coast at Sutton (see below), northwards along the coast at Malahide and Balbriggan and most notably on Lambay Island (Baker 2010, pg. 8), whilst the estuaries of Malahide and Rogerstown have proven to be particularly abundant in artefacts dating to the period (Nolan 1981). A large shell midden site, DU015-024, was identified 7km northeast of the Proposed Development in Burrow townland, close to the village of Sutton. Archaeological sites dating to this period are usually situated on or close to the shoreline and are typical of the transitory hunter-gatherer nature of these early occupants, who adapted themselves and their lifestyle to fit their landscape and habitat.

11.3.3.2 Neolithic Period (c. 4000-2800BC)

The Neolithic period marked a wholesale change in the way that humans occupied the landscape, they adapted their environment to suit their needs, whereas they had previously adapted themselves to their environment. Habitation became fixed, with the lifestyle revolving around the cultivation of crops and animal husbandry in tandem with the construction of large, stone-built monuments, both of which necessitated deforestation of large areas of the landscape and a large, settled and secure population. Although no archaeological remains or sites dating to this period have been recorded or discovered on or in close (500m) proximity to the Proposed Development, the situation of the subject site on a south facing slope of fertile ground, close to the coast, with an adjacent source of freshwater (River Naniken) would have presented a prime development opportunity, just as it does today. One need only look to the higher reaches of the Howth peninsula to observe upstanding monuments typical of the Neolithic Period in the wider area of Dublin, north of the River Liffey. The Cairns DU016-007, DU019-003, DU019-006 and the tomb DU015-028001 are typical of the surviving funerary monuments of the Neolithic and are significant indicators of a large, settled human population in the general area of the Proposed Development during the Neolithic. The latter tomb (DU015-028001) was discovered in the late nineteenth century and is described as a stone cist (L 9m; W 0.7m), which was exposed during house construction work in 1897 (Shearman

1866-9, 330-32). It was constructed of limestone blocks and covered by a mound (Westropp 1922, 64).

Three Burial Mounds DU015-019, DU015-020 and DU015-023 are recorded as being located on the narrow isthmus of land between Sutton and Howth and in the absence of datable materials retrieved from these it should be noted that whilst burial mounds usually date to the prehistoric period, this is not always the case. Elsewhere on the Hill of Howth the portal tomb, DU015-032 was recorded with its single chamber, another classic example of this type of tomb, which were built throughout much of northwest Europe during the Neolithic period. In its elevated location at the foot of Muck Rock on the north side of Howth Head the latter portal tomb would have been visible from much of the coastline north of here, a stretch of coast which has various funerary monuments of similar date dotted along its length and indeed there would be a direct line of site to/from the tombs (cairns) built during this period on Lambay Island 17.5km to the northwest of the subject site.

11.3.3.3 Bronze Age Period (c.2800BC-800BC) and Iron Age Period (c.800BC-500 AD)

Both periods are well represented by recorded and excavated archaeological sites within the greater North Dublin region so the apparent paucity of sites dating to this period in close proximity to the Proposed Development should not be seen as a complete absence from this locale, especially when viewed in the context of the wider landscape surrounding the subject site. Two copper alloy axe heads, dating to the Bronze Age were found at Clontarf (Stout 1992, 9–10) and although there are no further indications of settlement dating to this period in the area, the presence of potential archaeological sites and/or features on the subject dating to either the Bronze Age or Iron Age cannot be and should not be ruled out.

The date which the majority of the existing housing stock surrounding the Proposed Development was built (c.1950 or later), prior to modern archaeological planning conditions, and the presence of St. Anne's Park have to be considered as factors in the apparent absence of archaeological sites, finds and features dating to the prehistoric period in the general and immediate area surrounding the Proposed Development site.

11.3.4 Historic Period

11.3.4.1 Early Medieval Period (500-1100 AD)

The area surrounding the Proposed Development is relatively rich in evidence relating to the occupation and use of this immediate part of the landscape of north Dublin during this period. The adjacent place names of Killester and Raheny are both of early medieval origin; the placename prefix 'Kill' in Killester (Cill Easra or the Church of Esra) denotes the site of a church with an early medieval foundation in the Irish landscape. In the case of Raheny (Ráth Éanna or Ráth Éainnaigh meaning the fort of Éanna) the use of the placename prefix 'Rath' denotes the presence of a fortified circular enclosure typical of the period, which are more commonly known as a Ringfort or Rath. The fort at Raheny is recorded as being the site of the early church (DU015-082001) which was rebuilt in 1712 and dedicated to St. Assam and which was also associated with St. Nessian's church & monastic foundation on Ireland's Eye (the name Assam being a possible corruption of Nessian). Elsewhere whilst debate surrounds the exact date and etymology of Clontarf (Cluain Tarbh being generally taken to mean 'Meadow of the Bulls') the church site at Clontarf (DU019-015001) is suggested to be on the site of an earlier church dating to this period, which was established by St. Comgall c.550 AD.

In Ireland during the Early Medieval Period the basic political and jurisdictional territorial unit was known as a T \acute{u} ath (meaning and referring to a territory and/or a tribe) and these units are suggested by Stout (2017) to be a roughly equivalent territorial unit to the modern-day Barony/Civil Parish. The Proposed Development is situated on the townland boundary/border between the townlands of Sybil Hill and Maryville which itself forms the boundary between the civil parishes of Clontarf and Raheny respectively. The delineated area of each of the civil parishes is taken as being based on the system of medieval church parish divisions and thus it is possible that the subject site occupies the boundary between neighbouring T \acute{u} atha, and therefore the line of that boundary is considered to be an area of archaeological potential (AP1). Activity in the general area during this period is evidenced by another characteristic monument typically dated to this period, Holy Wells, and there are two examples of this site type in the locale of the subject site: RMP DU019-012 in the southeastern corner of St Anne's Park and to the west, RMP DU019-013, on The Stiles Road, Clontarf. Their proximity to and association with early ecclesiastical sites belies an earlier pagan or prehistoric origin which is often attributed to many of these sites.

As mentioned above the subject site was located in the territory of the Ciannachta Breg at the start of the Early Medieval Period. The Ciannachta claimed descent from Tadc mac C \acute{e} in, a member of the legendary early Munster dynasty, who was said to be a grandson of Ailill Aulom. They are first recorded sub anno 535 when they were defeated in battle at Luachair M \acute{o} r (between the rivers Nanny and Boyne), near Duleek, by T \acute{u} athal M \acute{a} elgarb, who was the High King of Ireland at the time. The Ciannachta Breg were again defeated at the battle of Imblech Pich (Emlach, near Kells) in 688 AD by King Niall mac Cernaigh, the King of Brega and subsequently their lands were absorbed by the S \acute{i} l n \acute{A} edo Sl \acute{a} ine, the descendants of \acute{A} ed Sl \acute{a} ine, who was the son of Diarmait mac Cerbaill, the then High King of Ireland. They dominated the kingship of the Proposed Development area from the seventh to the eleventh centuries as a part of the ruling dynasty of Brega, the Southern U \acute{i} N \acute{e} ill, who claimed descent from Niall No \acute{i} giallach (Niall of the Nine Hostages) and his son Conall Cremthainne (Byrne 1973). In 742 AD the S \acute{i} l n \acute{A} edo Sl \acute{a} ine king of North Brega, Conaing mac Amalgado, began using the title of the 'King of Ciannachta', the first of seven North Brega kings to do so. In time, the U \acute{i} Chonaing (descendants of Conaing mac Amalgado) conquered and assimilated the territory of the subject site into Brega, while retaining use of the 'King of Ciannachta' title for themselves.

The arrival of the Vikings to Irish shores occurred soon after and whilst the earliest documented raid in 795 AD on Rechru has been argued to be Lambay Island and not Rathlin Island, the recorded raid on St. Patrick's Island off the Fingal coast three years later, the raid on Skerries and the breaking of the shrine of Do-Chonna in 798 AD are indisputable, as is the targeting of the monastic site at Lusk with numerous raids, such as in 827 AD and the burning of the church there in 856 AD. According to the Annals of Inisfallen, nearby Howth was raided repeatedly by the Vikings with the first raid at Howth mentioned by the Annals of the Four Masters in the year 819 AD, whilst in the same year the Annals of Inisfallen recorded 'the plundering of Etar by the foreigners, who carried off a great prey of women'. Two years later the Annals again recorded a raid on Howth, but eventually the seasonal blight of the Norsemen on the shores around Ireland gave way to their permanent settlement, with the first overwintering occurring at Dublin and Annagassan during the winter of 839/840 AD and thus the area of the subject site would have found itself within the Norse/Hiberno-Norse controlled hinterland (the Dylflinarskiri) which eventually surrounded the Viking town of Dublin, with the good quality farmland and favourable climate in North Dublin leading to the area becoming a

key supplier of agricultural produce, raw materials, fish and shellfish to the ever-expanding Viking foundation on the River Liffey.

11.3.4.2 Battle of Clontarf 1014 AD

Arguably the most historically significant event in close proximity to the site of the Proposed Development occurred with the Battle of Clontarf, Good Friday, 23rd April 1014 AD, a battle with apparent widespread consequence, at least in Western Europe and Ireland. The battle was fought between the opposing forces of the Vikings of Dublin, under Sitric (Sigtrygg) Silkbeard, the Hiberno-Norse King of Dublin and the High King of Ireland, Brian Boru (Brian Bóruma), who was a member of the Dál Cais tribe or Dalcassians, a previously obscure family based in Clare who began to emerge in the late 10th century. The battle was a victory for Brian, his son Murchad and King Maelsechlainn II (King of Mide), over a Hiberno-Norse alliance of Mael Mórda mac Murchada (King of Leinster), his nephew Sigtrygg Silkbeard (King of Dublin), and their Norse allies under Sigurd (Earl of Orkney) and Brodir (Earl of the Isle of Man). The Viking forces summoned by Sitric beached their boats on the strand at Clontarf and set up camp there and despite their defeat it would appear that many Vikings continued to live in Fingal after 1014 (McIntyre 1987, pg. 83), however, their habitation in these lands was something which clearly had already been occurring over the previous century or more.

The location of the battle has been much debated, with many 19th-century commentators suggesting the battle took place closer to the Viking town of Dublin, somewhere on the ridge that runs from present day Phoenix Park towards the River Tolka near Clonliffe, whilst others suggest it took place in the area between modern day Santry and Baldoyle. Unfortunately, in the area immediately north of the Liffey and Fairview, the subsequent centuries of reclamation and development have radically altered the coastline of Dublin Bay, which adds to the difficulty of locating the potential battle site.

Despite his defeat at Clontarf and perhaps as a penance for his wrongdoing, Sitric Silkenbeard gave Dúnán, the first Bishop of Dublin, land to build the Church of the Blessed Trinity (Christchurch Cathedral) in Dublin c.1030, along with the lands of 'Beal-dulek [Baldoyle], Rechen [Raheny] and Portrahern [Portrane] with towns, cattle and corn' something that obviously could not have occurred had Sitric been completely dethroned and permanently exiled in 1014 (Ware 1705, pg. 134).

11.3.4.3 Medieval Period (1100-1600 AD)

By the dawn of the Medieval Period in Ireland the town of Dublin had grown considerably to become a wealthy trade centre. There was a recognisable urban street pattern, defensive walls and even some suburban development had occurred, together with the construction of a cathedral, parish churches and various monastic houses and thus it had become a worthy prize. Little surprise therefore that it was captured on the 21st of September 1170 by the Cambro-Norman nobleman Richard FitzGilbert de Clare (aka 'Strongbow'), who sought to cement his conquest and become ruler of Dublin by marrying Aífe, the daughter of the king of Leinster, Diarmait Mac Murchada. As a consequence, shortly after those events, in the year 1171 the Plantagenet King of England, Henry II, arrived to rein in his over-ambitious baron, taking the city for the crown and thereby establishing Dublin as the capital of the Norman territories in Ireland.

In 1171 Gill Mololmoa, a Dane otherwise known as Gilcolm, is recorded as holding lands in Raheny, which were seized by Strongbow in 1172 and granted to Vivien de Cursun. The

latter's son John de Cursun succeeded as 'Lord of Rathenny and Kilbarrock' but was murdered by the de Lacy family (the Norman Lords of Meath) in 1208. Subsequently, Raheny church came under the control of St Mary's Abbey, Dublin, who had also acquired grange lands in Raheny in 1172-3, and thus it became one of the principal medieval manors of the Dublin region. In 1172 the lands of Clontarf were granted to Adam de Pheope by Hugh de Lacy, the Lord of Meath (Murphy and Potterton 2010).

According to Lewis' Topographical Dictionary of Ireland (1837), Sir Amorey Tristram and Sir John De Courcy landed at Howth on St. Laurence's Day, 10 August 1177, leading a large military force which defeated the Norse inhabitants of Howth, at what is referred to as the 'Battle of Evora Bridge', also known as the 'Battle of the Bloody Stream'. That event evidences the continued Norse occupation of at least part of North Dublin, some 160 years after the Battle of Clontarf. Sir Amorey was awarded the lordship of Howth on account of the victory and he took the name St. Laurence as his own. As a reward for his service the Manor of Howth was granted to Almaric (Armory) de St. Laurence in 1180 by Henry II. In 1226 Henry II granted the manor of Clontarf to the Knights Templar, as part of his penance for the murder of Thomas á Beckett (McIntyre 1987, pg. 26), but with the suppression of the Knights Templar in 1307, Clontarf Manor passed into the control of the Knights Hospitallers (also known as the Knights of St John of Jerusalem), who were headquartered at Kilmainham.

Following the dissolution of the monasteries in 1540-41, the St Lawrences of Howth were granted lands in Raheny and Baldoyle (Murphy and Potterton 2010) by Henry VIII, whilst the Crown took possession of the Clontarf estate in 1541, whilst the Order of the Knights Hospitallers was disbanded in 1542. Under the 'surrender and regrant policy', the last Prior of the Knights, Sir John Rawson, was granted a peerage, created Viscount Clontarf with an annual pension of 500 marks and given a seat in Parliament (McIntyre 1987, pg. 27).

11.3.4.4 Post-Medieval Period AD1600-1800

As a direct result of the 'Dissolution of the Monasteries' most of the lands in the Raheny area were under the ownership of the St Lawrences of Howth by 1600 AD and in that same year the 'Manor, territory, tithes, town and lordships' of Clontarf were granted by Queen Elizabeth I to Sir Geoffrey Fenton, principal Secretary of State for Ireland, with Fenton's son, Sir William, inheriting the property in 1608.

By the 1640s, the property and parish boundaries on the northern edge of Dublin City, at Raheny, Clontarf, Coolock, Killester and Glasnevin, were in a state of flux (Smyth 1992, pg. 153). The 1641 Rebellion received widespread support in Raheny and Clontarf and in order to suppress the rebellion, Sir Charles Coote led his forces from Dublin City, burning the village of Clontarf and attacking Clontarf Castle. In 1649 Cromwell granted the confiscated Clontarf estate to Captain John Blackwell, who subsequently assigned it to John Vernon, Quartermaster General of Oliver Cromwell's army in Ireland. Vernon relinquished the lands upon the restoration of Charles II to the throne in 1660, however, they were subsequently returned to another member of the Vernon family and Clontarf Castle remained in the family's possession until Edward Kingston Vernon passed away in 1967.

Sir William Petty's Down Survey map of 1656-58 (Figure 11-2) indicates the extent of the holdings of the St Lawrence family in the Barony of Coolock and area of the subject site. By the 1660s, Raheny, Clontarf and Drumcondra had become centres for gentrified settlement outside of the city (Smyth 1992, pg. 174). In 1732 John Vernon of Clontarf Castle leased Sybil

Hill House and 36 acres (14.57ha) of land to James Barlow for a term of 999 years (Gogarty 2013, 27) and in the same year, Joseph Fade, a banker from Thomas Street, Dublin, leased Furry Park from Vernon (Gogarty 2013, pg. 23).



Figure 11-2 Down Survey Map of the Barony of Coolock 1656-58, location of Proposed Development circle in red

A more detailed map of the area was carried out by John Rocque in 1760 as part of his 'Map of County Dublin' (Figure 11-3). A 'Church in Ruins' was noted at Killester, whilst a 'Windmill' was noted at Raheny, adjacent to the unnamed Naniken River. Most of area depicted as being dominated by field systems, with some notable exceptions where large houses were present, one of which is depicted, but unnamed, on the southern side of the Naniken River where the location of two structures, their orientation and the position of the entrance avenue, gardens and the date of the source all suggest that this was an early illustration of Maryville House (Figure 11-3). The village of Clontarf is illustrated, as is the area at the bottom of modern-day Vernon Avenue, which was noted as 'Clontarf Sheds'.



Figure 11-3 Extract of Rocque's 1760 Map of the County of Dublin, proposed site location outlined in red

During the eighteenth century the land around Clontarf and Raheny became popular as the location for villas belonging to the gentry and professional classes. Houses such as Sybil Hill, Furry Park, Bay View and Verville were built during the eighteenth century and this trend continued into the opening decades of the nineteenth century with the construction of Bedford Lodge, Baymount Castle, Sea View and Mount Prospect. Some of these, including Sybil Hill House, were altered and extended in the nineteenth century, while others, such as St Anne's, were demolished and new houses built on the site.

Throughout much of this period Raheny remained a quiet country village with most of the population engaged in agriculture. Lewis (1837) noted, 'The land is in general of good quality, the greater portion is meadow and pasture, and the arable land produces excellent crops of wheat; the system of agriculture is in a very improved state, and there is neither waste land nor bog. Limestone of good quality is abundant and is quarried for building and for agricultural purposes.' Lewis (1837) also listed Sybil Hill among the 'many handsome seats and villas' of Clontarf. D'Alton (1838, pg. 55) records that the population of the parish and village of 'Ratheny' in 1821 was 505, rising to 608 by 1831 with 'Lord Howth' remaining the chief proprietor. An examination of the 1st-edition Ordnance Survey map of 1837 (Figure 11-4) shows a well-developed layout of fields surrounding both Sybil Hill House and Maryville House, with access to both of these properties deriving southeast from the Howth Road, as Rocque had illustrated nearly 80 years earlier. In the case of the former mansion, the gardens and a nucleation of smaller structures is evident to the northwest of the house, whereas in the case of Maryville the gardens are located to the east of the house and associated structures to the rear (north), as per Rocque.

The first edition Ordnance Survey map of this area, published in 1843, shows the villas dotted around the district. In the extract from the map that is reproduced above, which covers a

relatively small area, no less than thirteen villas are included,, each with the extent of its grounds shown with a grey stipple, while others are just outside the area shown. The extent of the present application site is marked with a broken red line, which shows that in the mid-nineteenth century this land was partly within the grounds of Sybil Hill House, though mostly within the grounds of Maryville. In this map extract St Anne's is towards the right-hand side of the map, a little above centre; the grounds of St Anne's are shown as running westwards to the green line, which depicts the boundary between the civil parishes of Clontarf and Raheny.

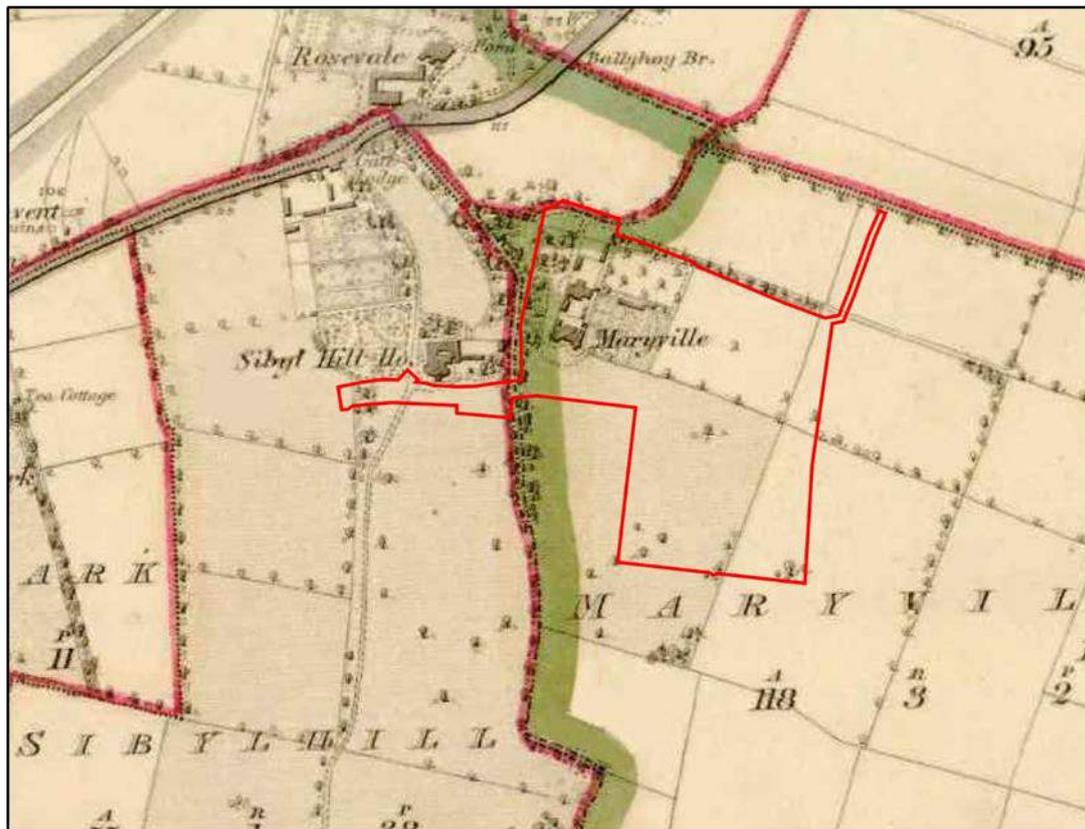


Figure 11-4 Detail of Ordnance Survey map of 1843 with site boundary overlaid

The opening of the Dublin and Drogheda Railway in 1844 drew an influx of new residents to the area and the resulting expansion of settlement is evident on the later mapping such as the 25-inch mapping of 1909 (Figure 11-5). The 1860 2nd-edition OS map depicts little change to the layout of the lands of the Proposed Development site and no change to the structures or surrounds of Sybil Hill or Maryville and as such it has not been included here, plus its level of detail is quite poor. Similarly, Weller's 1885 map is annotated with both house names, but it shows so little other detail that it is not deemed to be pertinent for inclusion here.

The greater scale of the 1909 25-inch Ordnance Survey mapping (Figure 11-5) affords a far more enlightening vista on the lands of the Proposed Development site. The structure of Maryville house, as per the photograph (Figure 11-6) is apparent, with its bowed flanking end bays crystallised with illustrated structures to the rear, gardens to the east and entrance to the west, through the adjacent Townland/Civil Parish boundary. Also evident is the line of the Proposed Development's entrance avenue, south of Sybil Hill House, to a point in the landscape southwest of that structure which would be later occupied by the line of Sybil Hill Road. The proposed entrance avenue also appears to transit through an illustrated laneway which led to the main avenue entrance to St. Anne's Mansion/Thornhill House.

The name St Anne's Park was given to that estate by Benjamin Lee Guinness (along with an additional 'e' in Anne) in honour of St Ann's Holy Well (DU019-012), which is still located in the southeastern corner of the modern park adjacent to the pond, the location of the latter prompting Branigan (2012) to suggest that the imposition of that landscape feature was the probable cause of the well's dryness. The estate was formerly known as Thornhill estate, but it was renamed after its acquisition by the brothers Arthur and Benjamin Lee Guinness in 1835. The original holding included 29 acres of land but by 1878, the estate had grown to over 500 acres.

St Anne's Mansion was built during the Georgian period and was itself originally called Thornhill but after the estate was taken over by Elizabeth and Benjamin Lee Guinness the house underwent a series of expansions and developments, and a large Italianate-style residence was built by the Guinness family and modified over several generations.

Thornhill was built in 1814 by Sergeant John Ball and it was subsequently occupied by Hugh O'Reilly Esquire, before the lease was sold to Lord Ardilaun and his brother Arthur Lee Guinness. In 1873, Lord Ardilaun commissioned the architect James Franklin to redesign Thornhill and the building work for that redesign was carried out by Thomas Millard with the net result of the remodelling served to almost double the size of the original house.

James Franklin was born in Kerry to minor landed gentry in 1835 and in 1850 he moved to England serving apprenticeships in various notable architectural firms including Summers, Day and Baldock mechanical engineers and then in the offices Frederick William Porter in London. He worked for a number of other architects in London, Manchester and Sheffield before in 1861 he returned to Kerry. In 1862 he was appointed to the position of district architect under the Irish ecclesiastical commissioners in charge of the North-western Division. In 1869, after the disestablishment of the Church of Ireland, he set up his own office at 179 Great Brunswick Street, Dublin.

Thomas Millard was born circa 1811 and originally, he worked as a cabinet maker in Cheltenham before arriving in Dublin in 1838, taking up a role with the Board of National Education. He later owned his own cabinetmaking and upholstery business on Mary Street in Dublin, but by 1853 his business was completely dominated by construction, carrying out jobs for the Board of Public Works, while also specialising in the erection of residential mansions for the nobility and gentry.

Griffith's Valuation of 1850 lists John Barlow Esq. (of Sybil Hill) as the occupier of Maryville, and the Earl of Howth as the lessor. The Barlow family of Sybil Hill had leased Maryville to increase their landholding (Gogarty 2013, 28) and in 1876, John Barlow, now a Justice of the Peace, and his son, John Herbert Barlow, sold the lease to Sir Arthur Edward Guinness of St. Ann's, Raheny for £5,000 (Gogarty 2013, 28; Ussher Sharkey 2002, 43). The Guinness family continued to enlarge their estate, purchasing other neighbouring properties, with such homes being retained as accommodation for the Guinness family stewards (Gogarty 2013, 16). In 1912 Maryville was listed as being occupied by Henry Kearney (Porter's Guide and Directory for North County Dublin 1912), but upon her death in 1925 Lady Ardilaun left the St. Anne's estate, including Maryville, to her husband's nephew, Benjamin Plunket, Church of Ireland Bishop of Meath.

At the time that the first edition Ordnance Survey map was published St Anne's had recently been demolished and rebuilt by the Guinness family. St Anne's was inherited by Arthur Edward

Guinness in 1868 and in 1874-76 he enlarged the property significantly, acquiring extensive lands to the north and west in the parish of Raheny. In 1876 he acquired the house at Sybil Hill, with its grounds, and two years later he added Maryville, which stood close to Sybil Hill House, to the east.

Having acquired a substantial area of land to add to his estate at St Anne's, Arthur E Guinness, with his wife, Olivia, laid out an extensive estate, with allées and parkland, and with extensive belts of holm oaks to give shelter from the salt-laden sea breezes. The principal avenue, 1300 metres long, ran westwards from the front of the house to the edge of the grounds of Sybil Hill House. However, he was not able to acquire the lands beyond Sybil Hill House and the entrance to St Anne's turned northwards through the grounds of Sybil Hill House to meet the Howth Road. The Guinnesses did not incorporate either Sybil Hill House or Maryville into the landscaped grounds of St Anne's and they continued to be occupied separately.

Arthur Edward Guinness was elevated to the peerage as Lord Ardilaun in 1880. After his death in 1910 Lady Ardilaun continued to live in the house until her death in 1925, though the estate was no longer kept up to its previous high standard. As the Ardilauns were childless, the property was inherited by Lord Ardilaun's nephew, Bishop Benjamin Plunket.

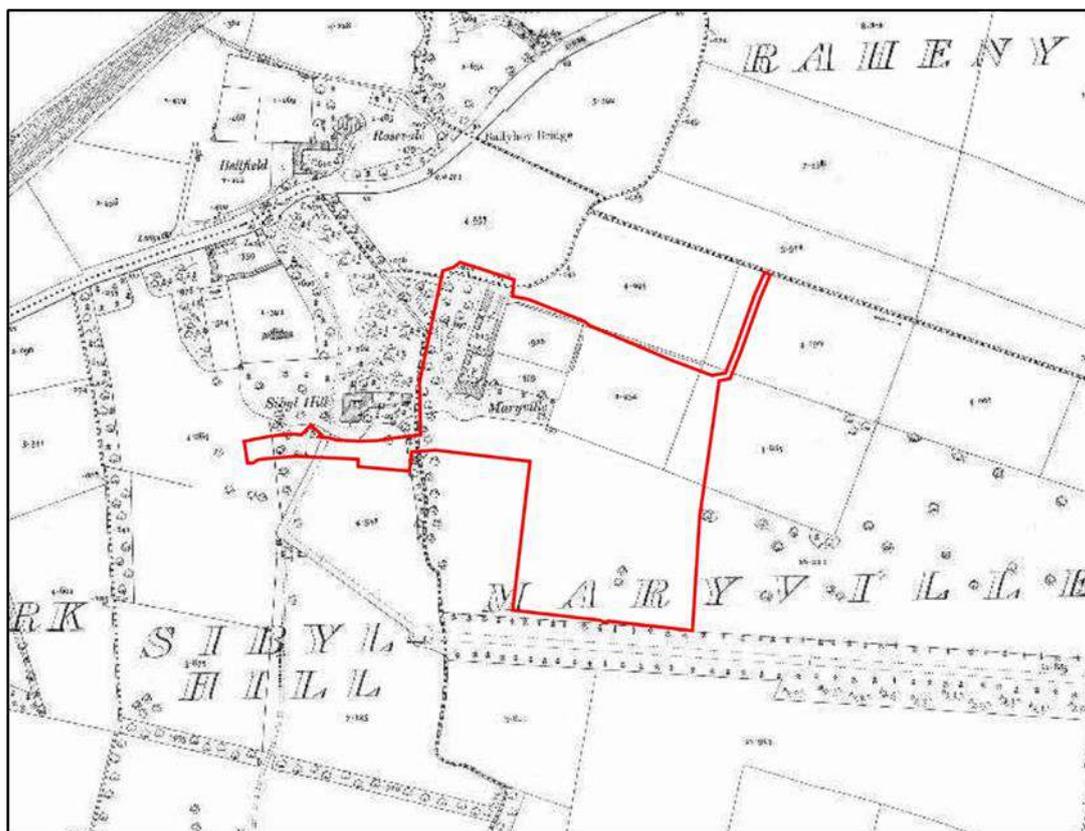


Figure 11-5 Detail of Ordnance Survey map of 1907 with site boundary overlaid

The map extract above shows the approximate outline of the application site superimposed on the Ordnance Survey map of 1907. Maryville may be seen in the north-western corner of the site.

In 1932, Bishop Plunket put the St Anne's estate on the market, though he found it difficult to find a buyer. In 1936 Dublin Corporation expressed an interest in acquiring it as housing land and this was pursued through the St Anne's Compulsory Purchase Order (CPO), 1938, the

public inquiry for which was held in September of that year. The order was initially made for 444¾ acres (180 hectares), the greater part of which was to be used for housing, while 176 acres (71.23 hectares) was to be used as a public park. The property belonging to Bishop Plunket was included in this total area of land covered by the compulsory purchase order, though it was acquired by agreement with Dublin Corporation and excluded from the order. In 1939 Bishop Plunket sold the estate to Dublin Corporation for approximately £55,000, after which it was used as a store by the Irish Defence Forces. Plunkett retained Sybil Hill House as a private residence and 22 acres of parkland (present day St. Paul's College and the Vincentian Order parochial house) (Sharkey 2002, 83). Sybil Hill House was not included in the CPO as Bishop Plunket retained it as his residence.

Maryville was included in the CPO, but as the Corporation's plans for the estate were put on hold due to the outbreak of the Second World War the property was not acquired at that time. The lease of Maryville House was assigned to Dublin Corporation in 1956, having been occupied since 1932 by Cecil Milne, who kept a dairy farm and market garden within its four acres (Ussher Sharkey 2002, 91) and St Paul's College (Secondary School) was located in the house until the present school building, designed by Downes and Meehan, was completed in 1957 (Gogarty 2013, pg. 28). Sybil Hill House then became home to retired Vincentian Fathers and it continues to fulfil that function to this day. In 1959 Dublin Corporation sold Maryville to the Vincentian Fathers for £3,500, who demolished it and used the additional 4 acres as playing fields (Gogarty 2013, pg. 28).

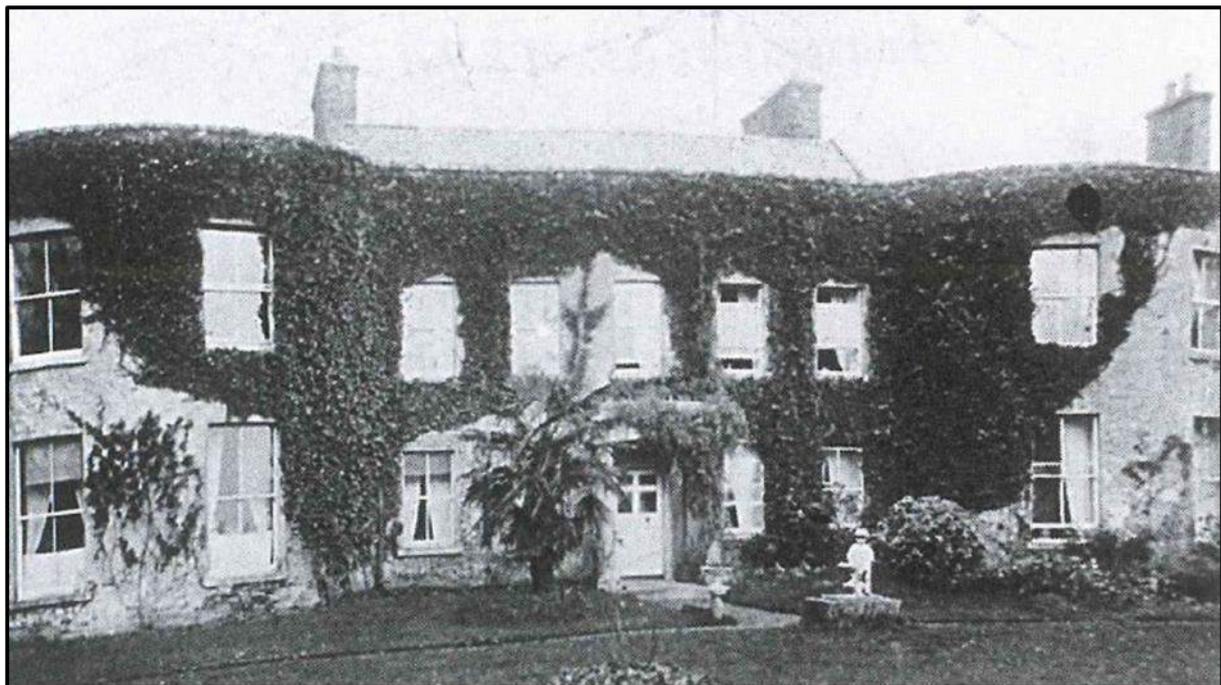


Figure 11-6 Front of Maryville House, undated (J. Sharkey 2002)

Sybil Hill House was not included in the CPO as Bishop Plunket retained it as his residence. Maryville was included in the CPO, but as the Corporation's plans for the estate were put on hold due to the outbreak of the Second World War the property was not acquired at that time. Maryville continued to be occupied by Cecil Milne, under a lease granted in 1932. Cecil Milne had run a dairy farm on the property, though during the war years he cultivated the land as a market garden and this use continued after the end of the war. Maryville was sold to Dublin Corporation in 1956.

In 1948 the Vincentian Fathers acquired 12.5 hectares of the St Anne's estate from Dublin Corporation for the purpose of building a school. The school, which they named St Paul's College, opened in 1952. A number of land transactions followed, as Bishop Plunket had died in 1947 and the Vincentian Fathers had been able to purchase Sybil Hill House from his family in 1950 (McIntyre 1987, pg. 149). In 1952 Corporation acquired part of the lands from the Vincentian Fathers along the western side of their property, so that they could lay out a new road to form a northward extension from Vernon Avenue – now Sybil Hill Road and the original entrance avenues to Maryville and Sybil Hill on the Howth Road were replaced by the residential development of The Meadows. To compensate for the loss of land, the fathers acquired land to the east of the school from the Corporation and this forms the southern part of the lands now the subject of the present application. The house at Maryville, with its grounds, were sold to the Vincentian Fathers in 1959. The Vincentian Fathers demolished Maryville and laid out the site and its grounds as part of the school playing fields.

The land transferred to the Vincentian Fathers in 1952 extended into what is now the Millennium Arboretum area within the park and did not allow for an efficient layout for playing fields. A further transaction was entered into with the Corporation in 1953 to swap that eastern part of the lands transferred in 1952 with an area to the north. This is clarified in the map below.

The spur of land within the present site that provides the access from Sybil Hill Road was formerly part of the grounds of Sybil Hill House.

St Anne's Park now extends to approximately 110 hectares, as compared with the 71.23 hectares originally envisaged when the lands were acquired.

11.3.5 National Monuments

Archaeological sites in the ownership or guardianship of the State or a Local Authority and sites under Preservation Orders are designated as National Monuments under the National Monuments Acts 1930-2004 and those sites are offered the highest level of protection under Irish legislation. There are no National Monuments or sites under Preservation Order located within the site of the proposed development or in close proximity to it (within 500m).

11.3.6 Record of Monuments and Places (RMP) and Sites and Monuments Record (SMR)

The Record of Monuments and Places is a list of archaeological monuments known to the National Monuments Service (NMS) and it is based on the earlier Sites and Monuments Record (SMR) files and the Archaeological Survey of Ireland. The Record of Monuments and Places (RMP) was established under Section 12 of the 1994 National Monuments (Amendment) Act.

No RMP sites are located on or near the site of the proposed development and only two RMP sites are marked as being located within a 1km radius of the proposed development by the online mapping. The nearest accurately listed RMP site is the Church and graveyard (DU019-010001, -010002) which is located 0.83km west of the proposed development, whilst the mapped location of the Casino Marino (DU019-037) 0.81km west of the proposed development is actually an error in the online Heritage Mapping and RMP databases, as the Casino Marino is actually DU018-144, located a further 1km to the west.

11.3.7 Archaeological investigations in the immediate vicinity of the proposed development

An examination of the excavation's bulletins website (www.excavations.ie) revealed no archaeological investigations have previously taken place within the site area of the proposed development. A number of archaeological investigations were documented in the wider area surrounding the site, these are listed in Table 11-1:

Table 11-1 Archaeological investigations carried out within close proximity to the subject site

License No.	License Holder	Investigation Type	Archaeology Found
94E0199	Judith Carroll	Assessment	No
96E0183	Judith Carroll	Assessment	Yes (see below)
99E0172	Tim Coughlan	Assessment	No
00E0611	Teresa Bolger	Assessment	No
02E01040	Tom Rogers	Monitoring	Yes (See below)
04E0967	Goorik Dehaene	Assessment	Yes (see below)
05E01246	Franc Myles	Assessment	No
06E0683	Emer Dennehy	Assessment	No
08E0740	Rob Lynch	Monitoring	No
09E0054	Rós Ó Maoldúin	Assessment	No
17E0384	Gill McLoughlin	Monitoring	Yes (see below)

Prior to the adoption of the current system of excavation licencing and numbering, roadworks in Raheny village in the 1970s uncovered an enclosure type-ditch interpreted by the investigating archaeologist Leo Swan as the outer enclosure of the medieval ecclesiastical site of Raheny.

Archaeological investigations carried out under licence ref. 96E0183 in 1996 by Judith Carroll at Cahill Motors, Raheny, revealed what was interpreted as part of the same enclosing ditch feature. The investigating archaeologist concluded that 'the area in which the ditch was found was important historically throughout the medieval period, and there are other boundary and defence feature of which such a ditch could form a part'.

Archaeological monitoring carried out by Tom Rogers under licence ref. 02E01040, on the Dublin North Fringe Water Supply Scheme, including c. 35km of water pipeline, uncovered tramlines beneath the Howth Road and timbers buried at a depth of 3m in Clontarf and additionally a possible medieval closed-arch culvert was uncovered at a depth of 1.2m in Clontarf.

Archaeological investigations carried out under licence ref. 04E0967 by Goorik Dehaene at 6 Main Street, Raheny produced five no. sherds of medieval pottery.

Nothing of archaeological significance was found during test trenching conducted at St Assam's Church, Howth Road, Raheny carried out by Rós Ó Maoldúin under licence ref. 09E00053.

Disturbed medieval and post-medieval deposits were identified during archaeological monitoring, at Scoil Assaim in the zone of archaeological potential around the ecclesiastical complex at Raheny in 2017, carried out by Gill McLoughlin under licence ref. 17E0384.

A non-intrusive geophysical survey 15R0095 was previously carried out on the site of Maryville House, the initial outcome of which highlighted partial evidence for the buried remains of Maryville House and the associated boundary features in the surrounding hinterland (see 11.3.12 below).

11.3.8 Topographical files

The National Museum of Ireland is the repository for the archive records of all known antiquities recorded by that institution, the files relate primarily to artefacts but also contain references to monuments and previous excavations. The files pertaining to the proposed development, which straddles the townlands of Maryville and Sybil Hill were examined 27/08/21, in addition to the surrounding townlands of Elm Park, Furry Park, Glebe, Greenlanes, Harmonstown, Raheny and Raheny South, however no information of relevance to the site of the proposed development was noted as being present in those files.

11.3.9 National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) records the architectural heritage of Ireland, from 1700 AD to the present day and it includes country houses, churches, mills, bridges and other structures of note. The only site in close proximity to the proposed development registered by the NIAH is Sybil Hill House (NIAH Reg. No. 50030086). Sybil Hill House is described by that register as a detached T-plan three-bay two-storey house, built c. 1750, having central full-height canted entrance bay to front (south) elevation, bow bays to side elevations, L-plan return and extensions to rear added c. 1810, and extensions to northeast added c. 1940. Hipped slate roof with central rendered chimneystacks and terracotta pots to front range and return behind balustraded granite and render parapet, central projection having moulded render cornices over canted-bay. Moulded render cornices to rear. Cast-iron rainwater goods and hipped slate roofs to return and extensions. Lined-and-ruled rendered walls, render quoins and plinth course, decorative render panels having foliate swags over to side elevations of first floor of entrance bay, with render eaves course. Square-headed window openings, having painted masonry architrave surrounds, granite sills, cornice and panelled apron over ground floor windows and eight-over-eight pane timber sliding sash windows.

Six-over-six pane timber sliding sash windows to west and rear elevations, tripartite timber sliding sash windows and four-over-four pane timber sliding sash windows to rear, windows to north elevation of extension to northeast lacking surrounds and having render sills and some windows having steel grilles. Six-over-six and three-over-three pane timber sliding sash windows and replacement windows to east elevation with render sills. Square-headed door opening to front with double-leaf half-glazed timber panelled door, leaded over-light, panelled render pilasters supporting fascia and cornice, and granite paved platform and nosed granite steps flanked by curved rendered dwarf walls with granite capping. Square-headed door opening to extension to north, with half-glazed timber panelled door and over-light. Segmental-headed door openings to rear with moulded render architrave surrounds and keystones, half-glazed timber battened doors, with sidelight to door to west. Granite-walled ha-ha to front. Set within mature parkland, ornamental trees to front and west elevations, sharing grounds with

recent school building to south. Oval-plan entrance hall to interior, plastered walls and ceiling, carved curved timber architraves to doors and with shutters to main door. Round-headed niches flanking main entrance, stone paved floor. Star rosette to ceiling. Imperial staircase opposite entrance hall, having scrolled balusters and decorative tread-ends. Sited in own grounds, shared with recent school building, with mature gardens, lawned areas and trees, curved avenue leading to entrance on Sybil Hill Road.

11.3.10 The Record of Protected Structures

The Record of Protected Structures (RPS) is a list of protected structures which cannot be demolished or materially altered without permission, and the only site in close proximity to the proposed development, which is listed by the RPS, is Sybil Hill House (RPS Ref. No. 7910).



Figure 11-7 Extract from Google Earth and 1st-edition OS mapping showing outline of some of the associated features of Maryville House (in orange) and the intersecting field boundaries (in blue)

11.3.9 Aerial Imagery

Aerial imagery is often an invaluable tool in assisting archaeologists in the identification of potential archaeological features via the observation of apparent patterns of differential growth in overlying vegetation, which are more commonly known as crop marks, shadow marks or soil marks. Despite the relatively long grass on the subject site, it is still possible to discern on recent aerial imagery some of the orientation (SSW-NNE) of Maryville House and gardens and the criss-cross field boundaries which are present to the east and south of that property as illustrated by the 1st-edition Ordnance Survey Map of the site (Figure 11-4).

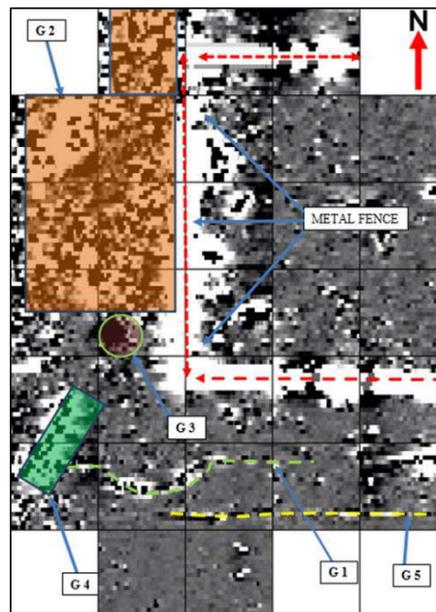


Figure 11-8 Map of Geophysical survey results on the site of Maryville House (Shanarch 2015)

11.3.10 Geophysical survey

A Geophysical survey of part of the proposed development site was undertaken by Shanarch Ltd. in September 2015. That survey was centred on the former location of Maryville House, with a series of geophysical anomalies G1-G5 (Figure 11-7) identified by the survey, which were interpreted at the time as being subsurface elements of that previously demolished structure. Anomalies G2 and G3 were noted as probably representing the most substantial evidence for remains associated with Maryville House, whilst anomaly G1 represented a distinctive arcing boundary corresponding with the same boundary on the earlier OS mapping. Anomalies G4 and G5 were suggested to be features of possible agricultural or geological origin or perhaps associated with the spread of demolished materials from the site of the former house. Recommendations to assess and mitigate for the impact of the proposed development on this part of the site are provided below as part of the overall suggested mitigation strategy for the proposed development.

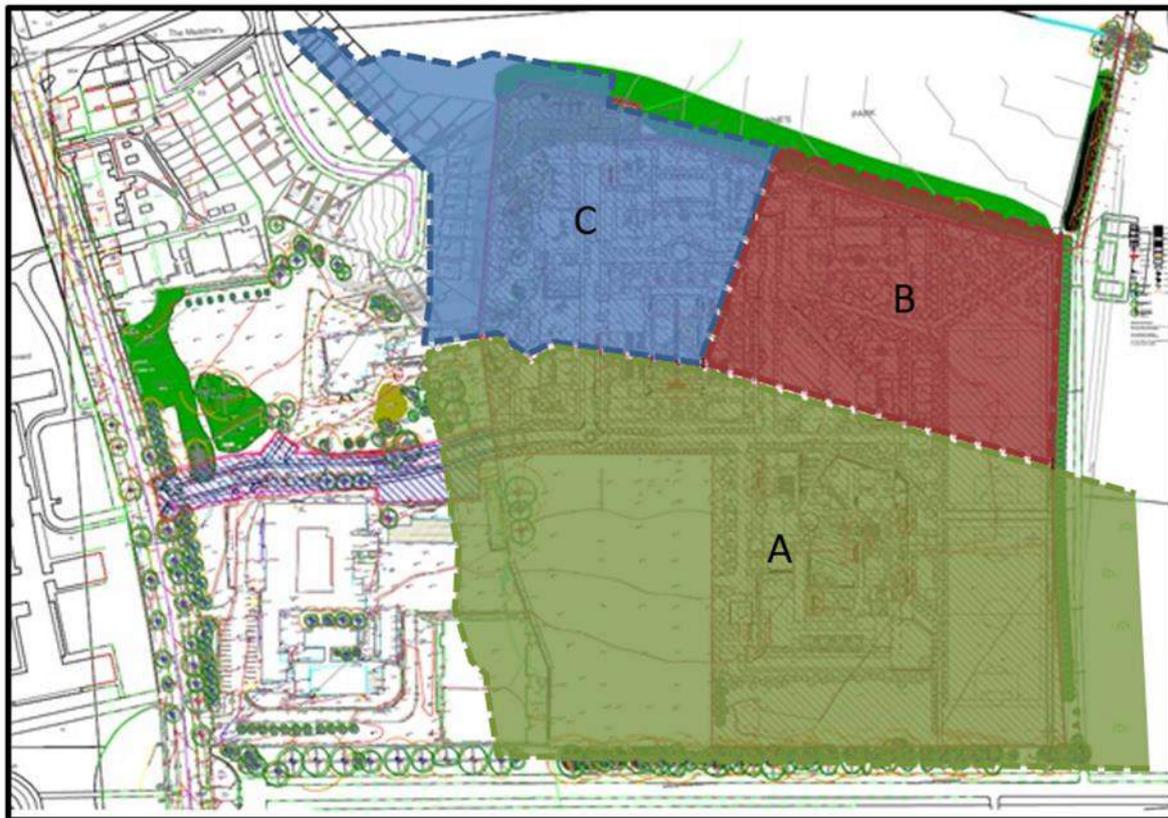


Figure 11-9: Summary of Land Acquisition

The map above summarises the various land transactions relating to the present site.

- A. Land acquired from Dublin Corporation in 1952 to compensate for land sold to the Corporation for the laying out of Sybil Hill Road. This acquisition included land now occupied by the Millennium Arboretum.
- B. Land acquired from Dublin Corporation in 1953 in a land swap, with the Corporation receiving the land now occupied by the Millennium Arboretum, to the east of the present site, and shown as the green area at bottom right in the map above
- C. Lands acquired in 1959 with Maryville.

11.3.11 Architectural Site Survey

The site that is the subject of this assessment consists of a sub-rectangular area of ground to the east of St Paul's College and Sybil Hill House, with a narrow strip of ground that joins it westwards to Sybil Hill Road.

The narrow strip at the western end of the site runs to the north of St Paul's College and to the south of the protected structure at Sybil Hill House. The present driveway leads in from Sybil Hill Road and turns a little northward to run to the house at Sybil Hill. The gateway is flanked by brick piers that support steel gates, while the front boundary runs in each direction, marked by a steel fence rising from a concrete plinth wall (Figure 11-10).



Figure 11-10 Gateway and railings at access from Sybil Hill Road

Where the driveway turns northward there is an area of grass directly ahead, to the east, interrupted by a number of trees (Figure 11-11).



Figure 11-11 Site for proposed access, with St Paul's School to right and Sybil Hill House to left

To the north of this strip there is a ha-ha that separates the grass strip from the parking area to the front of Sybil Hill House (Figure 11-12).



Figure 11-12 Site of proposed access road, with Ha-Ha at left

To the south of this access strip is St Paul's College, which dates from the 1950s (Figure 11-13). This is a two-storey, red-brick-faced building with a flat roof. It has a long frontage facing west towards Sybil Hill Road and this returns along the northern side, facing the proposed access to the present site.



Figure 11-13 St Paul's College

Sybil Hill House, which lies to the north of the proposed access to the site, is an eighteenth-century, two-storey villa, which was substantially altered and extended in the nineteenth century to give it its present appearance. The house is rendered externally and has its main

entrance facing southwards, towards the proposed access and St Paul's College (Figure 11-14).



Figure 11-14 Sybil Hill House with southern elevation at right and western elevation at left

The western elevation is also significant and looks over a small area of parkland towards a grove of trees. The northern elevation is of somewhat lesser significance but was nonetheless intended to be seen from within the grounds of the house, particularly as the original driveway ran southwards past the front of the house from Howth Road (Figure 11-15).



Figure 11-15 Northern elevation of Sybil Hill House

The eastern side of the house is more utilitarian and there are several outbuildings and additions to the house on that side, beyond which are trees within the grounds (Figure 11-16 and 11-17).



Figure 11-16 Eastern elevation of Sybil Hill House



Figure 11-17 Eastern side of Sybil Hill House, seen from application site

The Ha-Ha is a ditch, approximately 1.5 metres deep and faced on its northern side with reused stone setts from the streets of the city. On the southern side the ditch slopes up to ground level. The Ha-Ha runs in a gentle curve and is aligned approximately east-west. This Ha-Ha was constructed at the time that the school was built in the 1950s and serves to demarcate the limit of the area that may be used by children in the school grounds. The Ha-Ha is previously depicted in Figure 11-12.

There is a block of prefabricated classrooms on the site of the proposed access route, and these are depicted in Figure 11-18.



Figure 11-18 Prefabricated classrooms

The application site, other than the strip proposed as the access, is currently under grass. This is a substantial flat area of land measuring approximately 300 metres from north to south and 260 metres from east to west. This area is surrounded on the northern, eastern and southern sides by trees within the grounds of the adjacent St Anne's Park. On the western boundary there are trees along much of the boundary, particularly the northern section, which adjoins a housing estate and the central section, which adjoins Sybil Hill House and its outbuildings. The southern part of this boundary runs to the rear of St Paul's College.

Just inside the northern boundary of the application is a high wall that is faced with brick on the southern side and with brick and stone on the northern side (Figure 11-19).



Figure 11-19 Brick-faced wall near the northern boundary

This is the surviving northern wall of the walled garden associated with Maryville. The mode of construction is typical of garden walls of the period, with the lower part of the wall on the side facing away from the garden built in stone, which was relatively cheap, but faced with brick on the side facing the garden, as brick is good for heat retention and its use to face the wall, particularly a south-facing wall, enabled the growth of plants that would not otherwise have survived in our climate. None of the other boundaries of the application site are of historical significance. The surviving wall of the walled garden of Maryville is of historical significance and it is located within the boundary of the application site, but this structure will not be directly impacted should the Proposed Development be granted permission.

St Anne's Park lies to the north, east and south of the application site. This is a substantial park with many facilities and features. Access to the park from Sybil Hill Road is via a gateway that is of relatively recent date, though constructed to a design that reflects the traditional gates to large estates. Within the gateway there is a substantial avenue that formerly terminated at its eastern end at the main house at St Anne's, now gone. The avenue is bounded by mature evergreen oaks that provide a dense screening. The application site is to the north of the avenue, behind the line of trees. To the east of the application site there is an arboretum and

an area of playing fields, while to the north there are more playing fields. There are mature trees within the park along all three boundaries.

11.3.12 Archaeological & Cultural Heritage Site Survey

There is currently no direct access road to the subject site, located as it is to the rear of Sybil Hill House/St. Paul's College, which fronts onto the wide tree lined avenue of Sybil Hill Road, with the latter road not being constructed until the middle of the last century. The western boundary of the Proposed Development site proper is primarily delineated by the concrete block-built wall to the rear of Sybil Hill House, St. Paul's College and the Meadows Housing development whilst the southern extent of the western boundary has been enclosed by hoarding associated with the Proposed Development site. To the immediate south of the lands of the Proposed Development lies the tree lined, gated entrance avenue to St. Anne's Park (Figure 11-20 and Figure 11-21), which was laid at in 1880 as the grand entrance avenue to St. Anne's House, with the lands of the Proposed Development separated by a metal mesh fence and to the southwest the Proposed Development lands are immediately adjacent to St. Paul's College Lower Rugby Pitch, with hoarding separating the pitch from the Proposed Development.



Figure 11-20 Modern gateway to St Anne's Park



Figure 11-21 View eastward along avenue through St Anne's Park

To the east and along much of their northern side, the lands of the Proposed Development are surrounded by St. Anne's Park with the same green metal mesh fence separating the Proposed Development lands from the park. A north-south path (Figure 11-22) external to the fence, on the eastern side of the development lands, leads to a concrete-built footbridge (Figures 11-23 and 11-24) over the Naniken River and the All-Saints Road entrance to the park.



Figure 11-22 View north along path adjacent to eastern perimeter of Proposed Development



Figure 11-23 View northwards across Naniken River bridge to All Saints Road entrance to park



Figure 11-24 Western elevation of concrete-built bridge over the Naniken River

The remainder of the northern side of the lands of the proposed development was enclosed by a c. 70m length of wall, which represented the only upstanding remains of the former walled gardens of Maryville House. Constructed of red brick and bonded with lime mortar (Figure 11-25), this wall had a limestone rubble base which was only evident externally (to the north).



Figure 11-25 North facing elevation of Walled Garden wall, showing limestone foundation

It was approximately 3.5m in height, with red brick laid predominantly in a common bond, with varying string courses of brick-on-edge headers inserted using the same brick type throughout its elevation. Multiple repairs were evident on the internal elevation of the wall, employing varying brick types and dates, with some repointing of areas of the original bricks similarly evident. The western end of the wall appeared to have been whitewashed at some point in the past, possibly to reflect light and thus aid in horticultural endeavours and the surviving length of wall had been capped with concrete, which again was re-pointed in parts. Traces along the capping suggest that a greenhouse or glasshouse had formerly stood against this, the south facing wall of the former walled garden, a situation which would have been an obvious aid to horticultural endeavours.

The enclosed lands of the Proposed Development thus present currently as an open area, covered in long grass (Figure 11-26) which have previously been utilised as playing pitches/sports fields but at the time of visit were somewhat overgrown due to a lack of groundskeeping.



Figure 11-26 Proposed Development lands, facing northwest

Prior to the enclosure of the site, the area had been open to the park to the north, east and south and it was a permeable space, albeit slightly enclosed by the mature trees of the park. There was no discernible trace of Maryville House and gardens evident at ground level, with the sole exception being the red brick built remnant of the walled garden discussed above, however the western side of the development lands were noticeable as being slightly higher (0.3m) than the eastern side, a characteristic which was not present in the surrounding landscape and which might be attributed to the raising of the natural ground level on the western side for Maryville House or simply due to the covering of the demolished remains of Maryville House.

The concrete block wall mentioned above, dividing the Proposed Development lands and St. Paul's represents the only trace of a physical boundary between the civil parishes of Raheny (Maryville townland) and Clontarf (Sybil hill townland), and it would appear likely from the cartographic sources that this feature had been largely removed from the landscape subsequent to the 1909 mapping (Figure 11-5). The townland boundary between Maryville and Harmonstown in the northwestern corner of the Proposed Development lands at the time of visit was covered in scrub and overgrown, with some mature trees in evidence (Figure 11-27).



Figure 11-27 Overgrown northwestern corner of proposed development at townland boundary with Harmonstown

11.4 Characteristics of the Proposed Development

It is proposed to develop the larger area of land at the eastern end of the site for residential purposes, to include seven buildings of four to seven storeys, each with its own open space allocation, providing a total of 580 residential units, along with a nursing home and a crèche. The narrow strip connecting to Sybil Hill Road would provide for the access road leading into the site.

An access road will be provided from Sybil Hill Road, running to the north of the main St Paul's College building to reach the main part of the site. This access road would include new accesses to Sybil Hill House and to the college and it would consist of a carriageway with footpath and cycleway, bounded by walls and railings, with pedestrian and vehicular gates at the entrances to Sybil Hill House and St Paul's College.

11.5 Potential impact of the Proposed Development

11.5.1 Potential Architectural Impact of the Proposed Development

From a built heritage perspective there are two issues that need to be examined in assessing the potential impact of the proposal – the protected structure and the conservation area within St Anne's Park, adjacent to the site. In this examination, the principal issue relates to the operational element of the proposal. It is not considered that there would be any specific impact on built heritage during the construction phase.

In assessing the predicted impact of the Proposed Development on the built heritage of the site and its vicinity the potential impacts are categorised as either direct or indirect, the latter being taken as being an impact on the setting of the building or other structure that is of built heritage significance. In each case where the assessment below addresses any building, structure or historic landscape feature the text is accompanied by a summary list that states the level of predicted impact in accordance with Table 11-2 and, where relevant sets down the nature of the mitigation that would be required to address the predicted impact. The cumulative impact arising from the proposed sports complex development between the St Paul's College buildings and the application site is also addressed and is included in the summary list.

Table 11-2: Definitions of level of impact

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

11.5.2 Predicted impact of access road on Sybil Hill House

There would be no predicted impact on Sybil Hill House arising from the construction phase. The house at Sybil Hill House is set in its own grounds, separated from St Paul's College by a driveway, a parking area and an area of lawn, with groves of trees. To the front of the house there is a ha-ha that separates the grounds of the house from the college grounds to the south. While this appears to have been constructed at a late date, probably when the college was built, it nonetheless forms a definite demarcation between the grounds of the protected structure and the twentieth-century college buildings and grounds. It is noted that the ha-ha is not shown on the various Ordnance Survey six-inch maps published between the first edition in 1843 and the last before the construction of the school, which was published in the mid-1930s. The proposed access road would run between the ha-ha and the college building, at a distance of almost forty metres from the house. As such, the access roadway would have only a slight impact on the character of the protected structure or its setting at the operational phase. The proposed access road would run close to the edge of the ha-ha, however the side of the ha-ha nearest to the proposed road consists of a bank that slopes down to the bottom of the ditch; this is inherently stable and is not likely to be endangered by the proximity of the road provided it is safeguarded during construction.

The proposed sports complex is at a greater distance from Sybil Hill House and would not have a significant impact. It is not considered that there would be any cumulative impact arising from the two Proposed Developments.

Direct impacts on built heritage:	None
Effects on setting:	Slight
Cumulative impact:	None
Mitigation required:	None

The gateway is of mid-twentieth century origin and is not of heritage significance and its removal in order to provide for a wider access would not be a conservation issue.

11.5.3 Potential impact of residential development on Sybil Hill House

The nearest proposed building to Sybil Hill House would be apartment block A, which would run north-south directly to the east of the rear of the house and at a distance of approximately 65 metres to the corner of a rear return on block A and approximately 70 metres from the main part of the house. The eastern side of Sybil Hill House is the least significant side; the other three sides are designed to be seen from the parkland that runs around the house, while the eastern side faces into the courtyard of utilitarian structures and was clearly never meant to be a significant side of the house. Conversely, the principal views from inside the house are to the south, west and, to a lesser extent, the north, while the east does not feature significant views. It is also noted that there are trees planted to the east of the house and these provide screening.

It is not anticipated that the presence of Block A would have any significant impact on the character of the protected structure, given the nature of the house and the distance that would separate the new building from the protected structure.

The development at Ardilaun Court, completed within the last two years on the site to the north of Sybil Hill House, has a slight to moderate impact on the setting of Sybil Hill House, according to the assessment by ARC Consultants (included as a standalone document submitted as part of this application). This assessment was prepared for the planning application for the site to the north of Sybil Hill House at Ardilaun Court (DCC planning application reference 4242/15). This is consistent with the predicted impact of the present development, though the present proposal would be to the east of the house and not adjacent to the development to the north. It is not considered that there would be a significant cumulative impact.

Direct impacts on built heritage:	None
Effects on setting:	Slight
Cumulative impact:	None
Mitigation required:	None

11.5.4 Potential impact of residential development on brick-faced wall

It was noted in the building survey above that there is a brick and stone wall just inside the northern boundary of the site and that this wall was formerly the northern perimeter wall of the enclosed garden associated with Maryville, the house that formerly stood on the site. There would be no direct impact on the wall arising from the development, either during construction

phase or during the operational phase, though there would be a need to safeguard it during the construction phase to ensure that no accidental damage occurs. The wall in its present setting is out of context with its original function, in which it would have been used to enclose the walled garden and to provide a surface on which fruit trees and other plants could be grown, with a south-facing aspect and with the brick facing providing a heat sink to assist growth. The Proposed Development would be equally out of context with the original setting, while the proposed apartments in the vicinity would have ample space around them, leaving the wall with landscaped grounds separating it from the apartment buildings.

Direct impacts on built heritage: None

Effects on setting: Moderate

Cumulative impact: None

Mitigation required: The wall is to be protected from accidental damage during construction by means of a strong timber fence or hoarding.

11.5.5 Predicted impact of residential development on St Anne's Park conservation area

St Anne's Park is an important park and provides amenities for a substantial area in the north-eastern part of Dublin City. The park includes extensive parkland, with walkways and lawns, it has a significant rose garden and the Millennium Arboretum. Sections of the park are also given over to use as playing fields.

To the south of the application site there is a broad avenue that runs roughly east-west, from a gateway fronting Sybil Hill Road at the western end, towards the site of the former St Anne's House to the east. This avenue is flanked by lines of substantial holm oaks that provide a high evergreen wall on either side of the avenue or allée. The proposal would locate the nursing home and crèche in the area adjacent to this avenue, though set back approximately 45 metres from the boundary with the park.

To the north of the application site there are playing pitches in the park, with a belt of trees along the boundary line. On the eastern side the application site has more playing pitches adjacent to the northern end of the eastern boundary, while the southern part of the site abounds the Millennium Arboretum, which is a substantial area covered with young trees. The proposal includes playing pitches along the eastern and southern sides of the site, and this will provide a separation of more than 70 metres between the park and the nursing home/crèche in block G and the apartments in block F. The eastern end of block E would be at a distance of more than 55 metres from the eastern boundary with the park.

The apartments along the northern part of the application site would be higher and their location and the boundary in this location is not as comprehensively screened at the margin of the park, such that the upper part of the proposed apartments will be visible from the playing pitches in St Anne's Park to the north of the site. The bridge that crosses the Nanniken River to the north of the application site is not of heritage significance. While all areas of the park are used for walking, those areas used for pitches are not as sensitive as the parkland, the rose garden and other high-quality elements of the park and it is not considered that the Proposed Development would have a significant impact on the character of the park. The

bridge that crosses the Naniken River to the north of the application site will be demolished but is not of heritage significance.

Direct impacts on conservation area:	None
Effects on setting:	Moderate
Cumulative impact:	None
Mitigation required:	None

11.5.6 Do-nothing scenario

There would be no anticipated impact on built heritage that would arise as a result of this development not proceeding.

11.5.7 Potential archaeological impact of the Proposed Development

In assessing the potential of the proposed development to impact both the known and unknown elements of archaeological heritage on the proposed site, and in its vicinity, the potential impacts have been categorised as being either of a direct or indirect nature, the latter being taken as where there would be an impact to the setting of archaeological site, feature, find, structure or remains of archaeological significance.

Three sites of archaeological potential (AAP1, AAP2 and AAP3- Figure 11-8) were identified within the red line boundary of the proposed development site's footprint and will therefore be subject to a direct impact. As stated above, the entire site area, internal to the redline boundary, has been classified as an area of archaeological potential (AAP3), as there potentially may be unidentified or unknown elements of archaeological or cultural heritage significance within the boundary of the subject site and these would therefore be subject to impact.

Table 11-3 Site of Archaeological Potential 1 (AAP1) (Figure 11-10)

Site AAP1	Figure 11-8
County	Dublin
Barony	Coolock
Civil Parish	Clontarf & Raheny
Townland	Harmonstown, Maryville, Sybil Hill
NGR	E720320, N737500
Method of Identification	Cartographic
Site Type	Townland & civil parish boundary
Proximity	The townland and civil parish boundary forms the western and northwestern boundary of the proposed development

AAP1 Site Description:

The boundary between the three townlands of Maryville, Sybil Hill and Harmonstown is depicted by the 1st edition 6-inch OS map and the 1909 25-inch map (Figures 11-4, 11-5). Maryville townland is situated within the civil parish of Raheny, whilst Harmonstown and Sybil Hill townlands both lie within the civil parish of Clontarf, whilst both civil parishes belong to Coolock Barony. It is possible that a *Tuath* boundary may be fossilized in earlier sub-surface archaeological elements on the same line, such as an earth-cut ditch or ditch with traces of a corresponding bank/earthwork, delineating the boundary. As a result, the townland boundaries are considered to be a site of Archaeological Potential (AAP1). The unit of the civil parish was created by Elizabeth I in Ireland and it was based on the medieval church parish, which itself has the potential to preserve part of the earlier territorial boundary of a *Túath*. The term *túath* is an old Irish term for the basic political and jurisdictional unit of Gaelic Ireland, but it may refer to the people, clan or tribe that lived in the territory as well as the territory itself. A note of caution should be observed, however; following the events of The Reformation, modern day boundaries of civil parishes were changed and thus there is often some discrepancy between the boundaries of some Civil Parishes and *Túatha*.

Table 11-4 Site of Archaeological Potential 2 (AAP2) (Figure 11-10)

Site AP2	Figure 11-8
County	Dublin
Barony	Coolock
Civil Parish	Clontarf & Raheny
Townland	Maryville
NGR	E720363, N737520
Method of Identification	Cartographic, Field Survey, Geophysical
Site Type	Former site of house, associated buildings, garden, extant garden wall and relict demesne landscape
Proximity	Internal to proposed development

AAP2 Site Description:

Whilst the exact construction date for 'Maryville' is at present unknown we can say with some degree of certainty that the two unnamed structures depicted on Rocque's Map of 1760 (Figure 11-3) probably represent Maryville House, whose associated gardens were depicted on that source, to the east of the two structures. The positioning, south-southwest/north-northeast orientation and gardens are all consistent with the depiction of the house on the later OS mapping of 1837 (Figure 11-4). The latter cartographic source depicts Maryville as a southwest facing structure, with bowed flanking end bays, the image of the house in Sharkey (2002) of the southern elevation shows this to be a two storey five-bay structure, with bowed flanking end bays (Figure 11-6). The presence of a second structure on the 1st-edition (Figure 11-4), again following the depiction on Rocque, to the rear, on a parallel alignment, in addition to two other possible outbuildings lends further weight to the presence of Maryville on that earlier source. To the east a long narrow, southwest-facing structure was depicted by the 1st-edition within the

garden, its location and position suggest that this was a greenhouse or glasshouse. The footprint of Maryville and its associated structures alters little by the time of its subsequent depiction on the 1909 25-inch OS map (Figure 11-5), with the house itself remaining the same and the structures to the rear appearing to be enclosed by walls, forming yard like areas.

The solitary above ground feature which survives today, bearing testament to the presence of Maryville House and gardens is the c.70m in length section of red brick wall, located just inside of the northern boundary of the application site. This wall would have formed the northern wall of the walled garden (11-11 & 11-12) of Maryville House and thus it is of obvious historical significance. The wall was constructed using red brick, predominantly laid in a common bond, bonded with lime mortar, with a limestone rubble core and limestone foundation course visible externally on its northern side. It is approximately 3.5m in height with varying courses of headers inserted every 5-6 courses, capped with concrete and bearing evidence of multiple repairs both historic and modern in nature. The wall is typical of this type of horticultural feature, whose red brick would have retained heat and permitted plants to be trained on its elevations, with evidence also present on the elevation for a lean-to structure, possibly a glass house, which would have made use of the south facing aspect of this side of the garden. Evidence yielded by the geophysical investigations undertaken at the proposed site in 2015 suggest that much of the foundations of the walls of Maryville House, its outbuildings and the walled gardens, survive beneath the surface of the subject site (Figure 11-7), thus the subsurface remains have been deemed an area of archaeological potential (AAP2), as opposed to the extant garden wall, located to the north and external to the proposed development, which is upstanding and therefore of an architectural nature.

Table 11-5 Area of Archaeological Potential 3 (AAP3) (Figure 11-10)

Site AAP3	Figure 11-8
County	Dublin
Barony	Coolock
Civil Parish	Clontarf & Raheny
Townland	Maryville
NGR	E720524, N737396
Method of Identification	Cartographic, Field Survey
Site Type	Unknown
Proximity	All area of proposed development internal to redline

Given the scope of the proposed development (6.7ha), the construction and associated works have the potential to impact any as yet unknown elements of the archaeological and cultural heritage resource on the site, in an area where there is a diffuse, yet sustained, presence in the landscape throughout human history and indeed prehistory

on this island. Thus, the entirety of the 6.7ha, internal to the red line footprint of the proposed development, is classified as an area of archaeological potential (AAP3).

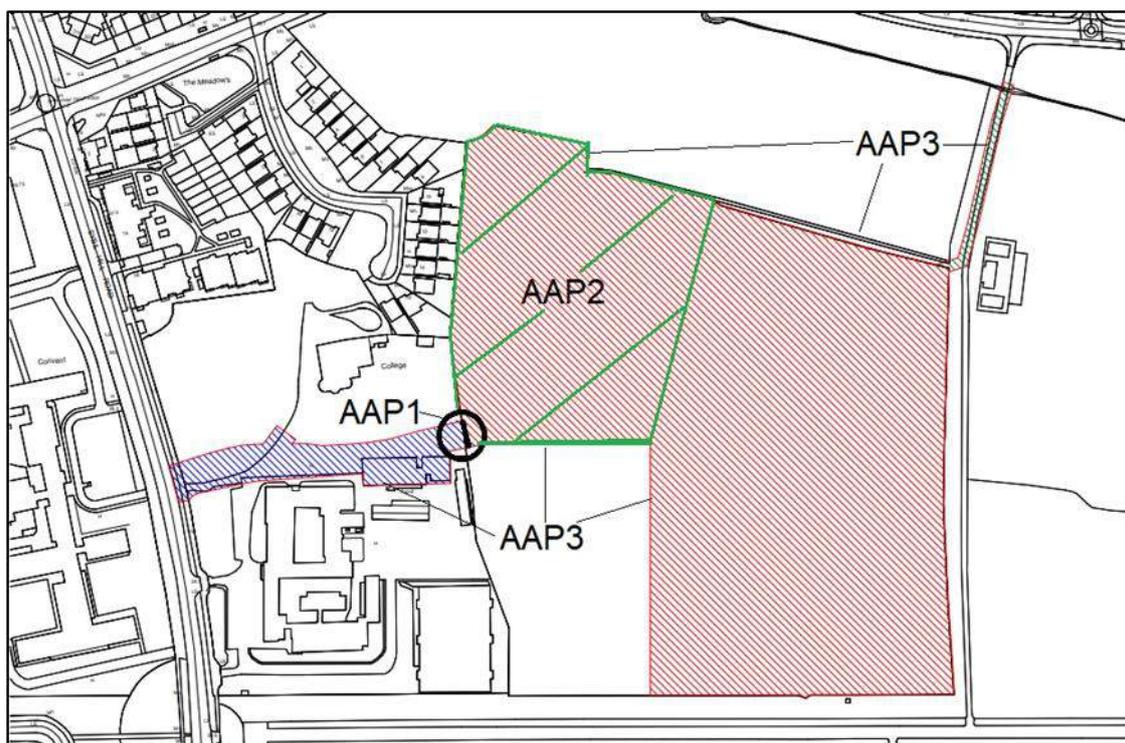


Figure 11-28 Proposed Development footprint showing locations of AAP1, AAP2 & AAP3 (Hawkins\Brown Architects)

11.5.8 Archaeological impact assessment criteria

The criteria used to assess the significance of the impact of a proposed development on an archaeological landscape, site, feature, monument or complex are defined as follows:

Table 11-6 Describing the significance of effects (based on EPA, 2022)

Impact	Definition
Imperceptible	An effect capable of measurement but without significant consequences
Not Significant	An effect which causes noticeable changes in the character of the Cultural Heritage environment but without significant consequences
Slight	An effect which causes noticeable changes in the character of the Cultural Heritage environment without affecting its importance.
Moderate	An effect that alters the character of the Cultural Heritage environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters an important aspect of the Cultural Heritage environment

Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of an important aspect of the Cultural Heritage environment.
Profound	An effect which obliterates important characteristics.

Factors that are considered in relation to assessing the potential impact of a Proposed Development on every site of archaeological and cultural heritage are its existing status/level of protection; its condition/preservation; its historic significance or attributed documentation; its group value; its rarity; its visibility in the landscape; its vulnerability and its amenity value.

In accordance with the guidelines set out by the EPA, each site, monument or complex is assessed on the basis of its context, character, significance and sensitivity/vulnerability. Any direct impact on a recorded archaeological monument or site is regarded at the very least as being a significant negative impact

11.5.8 Predicted archaeological impact of the proposed development

The Construction Phase of the Proposed Development will directly impact both areas of archaeological potential (AAP1 & AAP2) and any unknown elements of the archaeological resource (AAP3);

11.5.8.1 Predicted impact on AAP1

The proposed entrance avenue to the lands of the Proposed Development, from Sybil Hill Road, will have a significant direct impact at construction phase on the townland and civil parish boundary between Maryville townland, which is located in Raheny civil parish and the townlands of Sybilhill and Harmonstown, which are located within the civil parish of Clontarf. Additionally, the same boundary, which forms the western and north-western boundary of the proposed development has the potential to be negatively impacted by any treatment of that boundary or associated excavation along it or through it.

Nature of the impact:	Direct
Magnitude of impact:	Moderate
Impact type:	Negative
Mitigation required:	The section to be impacted should be archaeologically investigated and if deemed necessary, preserved by record (excavated).

Discussion

The construction of the entrance avenue to the Proposed Development will directly impact AAP1, the civil parish/townland boundary between the townland of Maryville, which is located in the civil parish of Raheny and the townlands of Sybil Hill and Harmonstown, which are located within the civil parish of Clontarf. This impact will result in the very likely permanent, irreversible loss of a small portion of the monument. As such, the magnitude of the impact is high, therefore, the effect is categorised as being significant and negative.

11.5.8.2 Predicted impact on AAP2

The redline footprint of the proposed development contains the former site of Maryville House in the form of its buried foundations and relict demesne landscape, including yards,

outbuildings and gardens as revealed by the geophysical survey of the site (Licence ref. 15E0095). This impact will result in the very likely permanent, irreversible loss of all of the surviving sub surface remains which are evident from the aerial photographs (Figure 11-6) and the geophysical survey (Figure 11-7) of the site. Thus, the magnitude of the impact of the proposed development is deemed to be high, with a very significant and negative on this aspect of the site's cultural heritage.

Nature of the impact:	Direct
Magnitude of impact:	Very significant
Impact type:	Negative
Mitigation required:	Archaeological test excavation to ascertain the full nature, extent and survival of the subsurface remains prior to construction works proceeding on site.

Discussion

The footprint of the Proposed Development contains the subsurface remains of the now demolished Maryville House in the form of its buried foundations and relict demesne landscape, including yards, outbuildings and gardens. The impact of the proposed development will result in the permanent, irreversible loss of those buried elements of that structure and its associated features.

Predicted impact on AAP3

The Construction Phase has the potential to have a direct, significant and negative impact across the entire proposed development footprint on any possible unknown archaeological features or cultural heritage materials, which might yet be present subsurface at this site.

Nature of the impact:	Direct
Magnitude of impact:	Very significant to profound
Impact type:	Negative
Mitigation required:	Archaeological test excavation to ascertain the full nature, extent and survival of the subsurface remains prior to construction works proceeding on site.

Discussion

As noted above, the Construction Phase of the Proposed Development has the potential to have a significant and direct negative impact on possible unknown archaeological features or cultural heritage materials, which might be present subsurface at this site. On the current level of information, the impact of the proposed development on any as yet unidentified archaeological features which might be present on is unknown and cannot be quantified.

11.5.9 Do-nothing scenario

There would be no anticipated impact on archaeology and cultural heritage that would arise as a result of this development not proceeding.

11.6 Avoidance, Remedial and Mitigation Measures

11.6.1 Architecture

It was noted in the building survey that there is a brick and stone wall just inside the northern boundary of the site and that this wall was formerly the northern perimeter wall of the enclosed garden associated with Maryville, the house that formerly stood on the site. There would be no direct impact on the wall arising from the development, either during construction phase or during the operational phase, though there would be a need to safeguard it during the construction phase to ensure that no accidental damage occurs. The wall in its present setting is out of context with its original function, in which it would have been used to enclose the walled garden and to provide a surface on which fruit trees and other plants could be grown, with a south-facing aspect and with the brick facing providing a heat sink to assist growth. The Proposed Development would be equally out of context with the original setting, while the proposed apartments in the vicinity would have ample space around them, leaving the wall with landscaped grounds separating it from the apartment buildings.

Mitigation required: The wall is to be protected from accidental damage during construction by means of a strong timber fence or hoarding.

11.6.2 Archaeology and Cultural Heritage

Three areas of archaeological potential were identified as being present within the footprint of the Proposed Development and where avoidance during the Construction Phase of the Proposed Development is not possible the following case appropriate mitigation measures are recommended:

AAP1 Mitigation required: The section of the boundary which will be impacted upon by the entrance avenue to the Proposed Development should be subject to investigation by a suitably qualified archaeologist, under licence to the Department of Housing, Local Government and Heritage, in order to fully ascertain the archaeological potential of this feature and, where necessary, a full written, drawn, photographic record will be made of this section of the feature, with environmental sampling, if deemed appropriate. This will in effect preserve the impacted section by record, where the remaining, unimpacted sections will be preserved *in situ*.

AAP 2 Mitigation required: The full extent of the buried sub surface features and elements of archaeological and cultural heritage interest should be ascertained by a program of archaeological test excavation, conducted by a suitably qualified archaeologist, under licence to the Department of Housing, Local Government and Heritage, in order to fully ascertain the archaeological potential of the remains. Following the successful completion of that program of test trenching a report should be prepared for submission to the National Monuments Service and the planning authority for further consultation and if deemed necessary further investigation/excavation.

AAP3 Mitigation required: The full extent of any unknown subsurface elements of archaeological and cultural heritage interest should be ascertained by a program of

archaeological test excavation, conducted by a suitably qualified archaeologist, under licence to the Department of Housing, Local Government and Heritage, in order to assess the site for the presence of archaeological remains and to fully ascertain the archaeological potential of the remains, should any be uncovered. Following the successful completion of that program of test trenching a report should be prepared for submission to the National Monuments Service and the planning authority for further consultation and if deemed necessary further investigation/excavation.

Where there is no archaeological material shown to be present during the test trenching phase, it may be prudent to undertake a programme of licenced archaeological monitoring during the ground reduction programme until the level of undisturbed deposits is reached, in order to further mitigate for the presence of unknown archaeological finds, features or deposits.

The application of the pertinent and necessary mitigation measures recommended above, and any others deemed relevant by the National Monuments Service and Dublin City Council, should be applied prior to the Construction Phase of the Proposed Development, in order to minimize any potential delays to construction and to eliminate any risk to the archaeological and cultural heritage of the site. As a result, there would be no further impact to the archaeological or cultural heritage of the site during the Operational Phase of the Proposed Development.

11.7 Residual impacts

Residual Impacts are defined as 'effects that are predicted to remain after all assessments and mitigation measures. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

Having regard to the mitigation measures proposed within this and other Chapters of the EIAR, no significant residual impacts are anticipated to any aspect of the archaeological, architectural and cultural heritage of the Proposed Development.

11.8 Monitoring

No specific monitoring measures are proposed in relation to archaeology and cultural heritage for the Proposed Development during the Construction and Operation Phase.

11.9 Interactions

11.9.1 Landscape and Visual

It is not predicted that any changes in landscape or visual amenities will affect in any way the archaeology and cultural heritage of the area. Subject to the implementation of mitigation measures detailed in Chapter 11, there will be no negative residual impacts upon the archaeological or cultural heritage resource.

11.10 Difficulties encountered in compiling this assessment

No difficulties were encountered in compiling this assessment.

11.11 References

Baker, C., 2009. 'Fingal's Past in the Present – An Overview' in C. Baker (ed.), *Axes, Warriors & Windmills: Recent Archaeological Discoveries in North Fingal*. Fingal County Council.

Ball, F.E., 1906. *A History of the County of Dublin, Volume 5: Howth and its Owner*. Royal Society of the Antiquaries of Ireland, Dublin.

Bence-Jones, M., 1988. *A Guide to Irish County Houses*. Constable, London.

Bolger, T. 2000. Belmont Park, Raheny, Dublin. Excavations.ie No. 2000:0336. Licence No. 00E0611. www.excavations.ie/report/2000/Dublin/0005159/.

Branigan, G. 2012. *Ancient & Holy Wells of Dublin*. The History Press Ireland. Dublin.

Byrne, P. (2000), "Ciannachta Breg before Sil nAeda Slaine", in Smyth, Alfred P. (ed.), *Seanchas: Studies in Early and Medieval Irish Archaeology, History, and Literature in Honour of Francis John Byrne*, Dublin: Four Courts Press, pp. 121–126.

Carroll, J. 1994. 17 Main Street, Raheny, Dublin. Excavations.ie No. 1994:097. Licence No. 94E0199. www.excavations.ie/report/1993/Dublin/0001706/.

Carroll, J. 1996. Cahill Motors Ltd, Raheny, Dublin. Excavations.ie No. 1996:136. Licence No. 96E0183. www.excavations.ie/report/1996/Dublin/0002267/.

Casey, C., 2005. *The Buildings of Ireland, Dublin*. Yale University Press, Connecticut.

Clarke, H.B., 2002. *Dublin, Part 1 to 1610: Irish Historic Town Atlas*. Royal Irish Academy, Dublin.

Coughlan, T., 1999. St. Francis's Hospice, Raheny, Dublin. Excavations.ie No. 1999:265. Licence No. 99E1702. www.excavations.ie/report/1999/Dublin/0004149/.

Craig, M., 1952. *Dublin 1660-1860*. Cresset Press, University of Michigan.

D'Alton, J., 1838. *The History of County Dublin*. Hodges & Smith, Dublin.

Dawson, T. 1976. The Road to Howth. *Dublin Historical Record*, 29(4), 122-132.

Dehaene, G. 2004. 6 Main Street, Raheny, Dublin. Excavations.ie No. 2004:0634. Licence No. 04E0967. www.excavations.ie/report/2004/Dublin/0011758/.

Dennehy, E. 2006. Tonlegee House, Raheny, Dublin. Excavations.ie No. 2006:690. Licence No. 06E0683. www.excavations.ie/report/2006/Dublin/0015434/.

Devitt, L.G., 2010. *Raheny, St. Ann's Estate, The North Bull Island*. Devitt, Dublin.

Dictionary of Irish Architects 1720-1940.

www.dia.ie/architects/view/1383/DARLEY%2C+FREDERICK+%5B1%5D%2A#tab_works.

www.dia.ie/works/view/40312/building/CO.+DUBLIN,+DUBLIN,+RAHENY,+SYBIL+HILL.

Dod's Peerage 1883, Baronetage and Knightage of Great Britain and Ireland, Whittaker & Co., London.

Downham, C., 2005. 'The Battle of Clontarf in Irish history and legend'. History Ireland 13:5, Sept/Oct 2005. www.historyireland.com/medieval-history-pre-1500/the-battle-of-clontarf-in-irish-history-and-legend/

Dublin City Development Plan 2016 – 2022, Record of Protected Structures, www.dublincity.ie/sites/default/files/content/Planning/DublinCityDevelopmentPlan/Documents/Dublin%20City%20Development%20Plan%202016%20%202022%20Volume%204.pdf.

Enclann Ltd and Headland Archaeology Ltd, 2008. 'Report on the Battle of Clontarf ('The Battle of the Weir of Clontarf'), 1014'. Unpublished report for Department of the Environment, Heritage and Local Government.

Foley, A., 2013. The Royal Manors of Medieval County Dublin: Crown and Community. Four Courts Press, Dublin.

Gogarty, C., 2013. From Village to Suburb: The Building of Clontarf since 1760. Clontarf Books, Dublin.

Griffith's Valuation, 1850. MaryvilleTownland and Sybilhill Townland.

Hankinson, C F J (ed.) 1953, Debrett's Peerage, Baronetage, Knightage and Companionship, Odhams Press, London.

Harris, M, 2009. The Follies and Garden Buildings of St. Ann's Park, Dublin. Senior Parks Executive, Dublin City Council.

Herity, M. (ed.), 2001. Ordnance Survey Letters of Dublin. Four Masters Press, Dublin. Ireland Genealogy Projects Archives.

Irish Times 7th September 1938

Joyce, P.W., 1913. Irish Names of Places. Vol. III. Dublin.

Joyce, W. St. John., 1912. The Neighbourhood of Dublin. Dublin.

Kilbride-Jones, H.E., 1939. 'The excavation of a composite tumulus at Drimnagh, Co. Dublin. Journal of the Royal Society of Antiquaries of Ireland 69:190-220.

Leases relating to the property

Lennon, C., 2008. Dublin Part II, 1610 to 1756, Irish Historic Towns Atlas No. 19. Royal Irish Academy in association with Dublin City Council, Dublin.

Lennon, C. 2014 *That Field of Glory – the story of Clontarf from battleground to garden suburb*, Wordwell, Dublin.

Lewis, S., 1837. *A Topographical Dictionary of Ireland*. Lewis & Co., London.

www.libraryireland.com/topog/R/Raheny-Coolock-Dublin.php.

www.libraryireland.com/topog/C/Clontarf-Coolock-Dublin.php.

Lynch, R. 2008. Edenmore, Raheny, Dublin. Excavations.ie No. 2008:486. Licence No. 08E0740. www.excavations.ie/report/2008/Dublin/0019500/

Lynch, R. 2009. Edenmore, Raheny, Dublin. Excavations.ie No. 2009:355. Licence No. 08E0740. www.excavations.ie/report/2009/Dublin/0020690/

McIntyre, D., 2014 (2nd edition), *The Meadow of the Bull: A History of Clontarf*, The Shara Press, Dublin.

McLoughlin, G., 2017. Raheny South, Dublin. Excavations.ie. No. 2017:174. Licence No. 17E0384. www.excavations.ie/report/2017/Dublin/0025987/

McQuade, M., 2008. 'Gone Fishin'. *Archaeology Ireland Spring 2008*, 8-11.

Murphy, M. and Potterton, M., 2010. *The Dublin Region in the Middle Ages*. Four Courts Press and the Discovery Programme, Dublin.

Myles, F., 2005. 2 Kincora Road, Clontarf. Excavations.ie No. 2005:408. Licence No. 05E1246. www.excavations.ie/report/2005/Dublin/0013412/

Ó Maoldúin, R., 2009. St. Assam's Church, Howth Road, Raheny, Dublin. Excavations.ie No. 2009:356. Licence No. 09E0053. www.excavations.ie/report/2004/Dublin/0020691/

Ó Cróinín, D., 1995. *Early Medieval Ireland, 400-1200*. Longman, England.

O'Keeffe, T., 2000. *Medieval Ireland, an Archaeology*. Tempus, U.K.

O'Gorman, T., 1879-80, 'On the site of the Battle of Clontarf', in *Journal of the Royal Society of Antiquaries of Ireland* 15, 169-82.

Rogers, T. 2002. Dublin North Fringe, Various, Dublin. Excavations.ie No. 2002:0512. Licence No. 02E1040. www.excavations.ie/report/2004/Dublin/0007829/.

Rogers, T. 2003. Fairview to Sillogue, Dublin. Excavations.ie No. 2003:0601. Licence No. 02E1040. www.excavations.ie/report/2004/Dublin/0007829/.

Ryan, J., 1938. 'The Battle of Clontarf', in *Journal of the Royal Society of Antiquaries of Ireland* 68, 1-50.

Shanahan, S. and Hanbridge, R. 2015. *Report on the Geophysical Survey, Maryville House, Raheny, Dublin 5*. Unpublished report.

Sharkey, J.U., 2002. St Anne's: The Story of a Guinness Estate, The Woodfield Press

Shaw's Dublin City Directory, 1850.

Smyth, W.J., 1992. 'Exploring the social and cultural topographies of sixteenth and seventeenth century County Dublin' in F.H.A. Aalen and K. Whelan (eds.), Dublin City and County: From Prehistory to Present'. Geography Publications, Dublin.

Stout, G. and Stout, M., 1992. 'Patterns in the Past: County Dublin 5000BC – 1000AD' in F.H.A. Aalen and K. Whelan (eds.), Dublin City and County: From Prehistory to Present'. Geography Publications, D

St Anne's Park website, <http://www.dublincity.ie/main-menu-services-recreation-culture-dublin-city-parks-visit-park/st-annes-parkublin>.

Taylor, A.B., 1958. 'Dumazbakki – an Irish placename in old form', in Journal of the Royal Society of Antiquaries of Ireland 88, 111-14.

Ussher Sharkey, J., 2002. St Anne's: the Story of a Guinness Estate. Woodfield Press, in association with Dublin City Council.

Waddell, J., 1998. The Prehistoric Archaeology of Ireland. Galway University Press, Galway.

Ware, Sir J., 1705. The Antiquities and History of Ireland.

Wren, J., 1983. 'From Ballybough to Surlogue's Bridge', in Dublin Historical Record 37(1), 14-29.

12 MATERIAL ASSETS

12.1 Traffic

12.1.1 Introduction

This chapter of the EIAR assesses the likely traffic and transportation impacts on the receiving environment during the construction and operational phases of the Proposed Development. The existing and proposed transport infrastructure in the area is described, and an assessment of the current and the future traffic environment is made. The impact of the development in terms of public transportation, pedestrian and cycle is also assessed.

The chapter describes: the methodology; the receiving environment at the application site and surroundings; the characteristics of the proposal in terms of physical infrastructure; the potential impact that proposals of this kind would be likely to produce; the predicted impact of the proposal examining the effects of the Proposed Development on the local road network; the remedial or reductive measures required to prevent, reduce or offset any significant effects; and the monitoring.

This Chapter was completed by Luke Byrne, BEng, MEng, Traffic Engineer, Waterman Moylan Consulting Engineers.

12.1.2 Study Methodology

The following methodology has been adopted for this assessment:

- Review of relevant available information including, current Development Plan 2016 - 2022, the Daft Development Plan 2022 – 2028, existing traffic information and other relevant studies;
- Site visit to gain an understanding of the site access and observe the existing traffic situation;
- Consultations with Dublin County Council Road Department to agree the site access arrangements and determine the scope of the traffic analysis required to accompany a planning application;
- Detailed estimation of the transport demand that will be generated by the development. The morning and evening peak times will be addressed as well as an estimation of under-construction and potential future developments in the surrounding area.
- Assessment of the impact of traffic on local junctions, car parking requirements and accessibility of the site by sustainable modes including walking, cycling and public transport;
- A traffic survey was completed for the local road network on Thursday 16th September 2021 by 'IDASO'.
- Software used for the junction was TRANSYT and PICADY for signalised junctions and priority junctions respectively. Further details on the methodology of TRANSYT and PICADY are shown in Section 12.7.

12.1.3 The Existing and Receiving Environment (Baseline Situation)

12.1.3.1 Receiving Environment

This section reviews the baseline conditions, providing backing information for the site in order to determine the significance of any traffic implications. It also considers the existing accessibility of the site by sustainable modes of transport.

12.1.3.2 Site Location

The Proposed Development is located in a green field site connected to St. Anne's Park to the east and to the south. St. Anne's Park contains GAA / Football Pitches, playgrounds and walking trails. There are also greenfield sites part of St. Anne's Park to the north of the subject site and approximately 350 metres beyond the greenfield sites is R105 Howth Road. To the west the subject site is bounded by Saint Paul's College, a residential estate called The Meadows. Approximately 250 metres further west this is bounded by R808 Sybil Hill Road.



Figure 12-1 Proposed Development Location

12.1.3.3 Local Road Network

Access to the Proposed Development is planned to be on R808 beside St. Paul's College at Junction 2. R808 is a single carriageway road approximately 1.85 km long with footpaths either side and travels in a North to South direction from R105 Howth Road to the coastline with R807 Clontarf Road. R808 can be split into two roads, Sybil Hill Road and Vernon Avenue. Sybil Hill Road is approximately 700m long from R105 Howth Road to the junction with Vernon Avenue. Vernon Avenue starts west of the Proposed Development and connects with the R808 via a junction with Sybil Hill Road. Vernon Avenue is approximately 1.7km long and finishes at R807 Clontarf Road.

R105 Howth Road is north of the Proposed Development and connected with R808 Sybil Hill Road. The R105 runs in a southwest / northeast direction from Howth to Dublin City Centre.

Sea field Road is south of the Proposed Development and runs in an east / west direction. Sea field Road is a single carriageway junction with residential housing on both sides of the road. There are pedestrian pathways either side also.

Further south from the Proposed Development along the coastline is R807 Clontarf Road. R807 Clontarf Road is a single carriageway running southeast / northwest and connects to R808 Sybil Hill Road directly south of the Proposed Development approximately 1.5km away.



Figure 12-2 Local Road Network

12.1.3.4 Baseline Traffic Data

In order to determine the volume of traffic movements at key junctions on the road network surrounding the subject development site, a classified turning movement traffic count was commissioned.

A manual Traffic survey was required for the following junctions shown in Figure 12-3 and listed below.

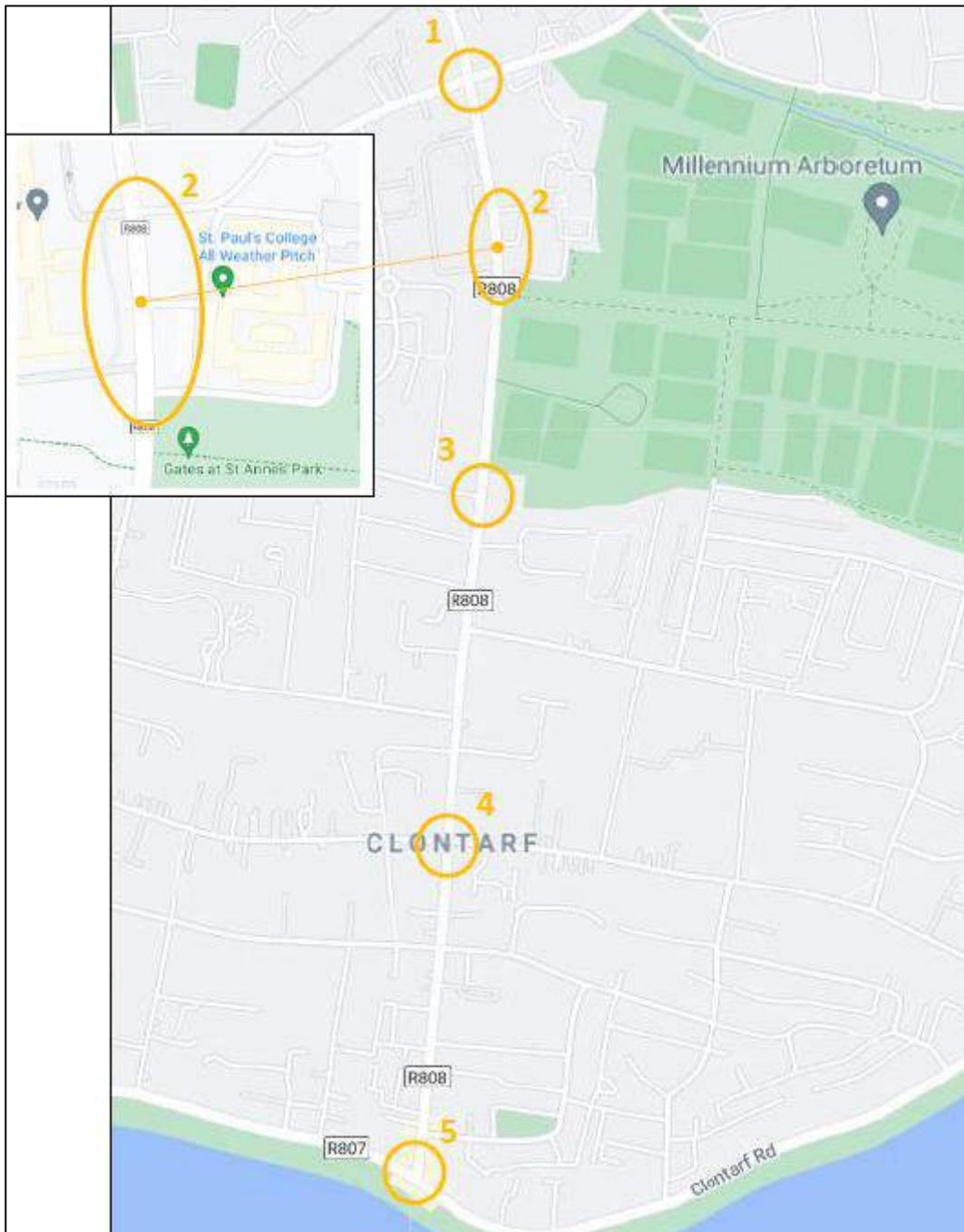


Figure 12-3 Junctions Surveyed

The names and types of junctions are listed below:

- Junction 1: Sybil Hill Road (R808) / Howth Road (R105).
- Junction 2: Sybil Hill Road (R808) / St. Pauls Access Road
- Junction 3: Sybil Hill Road (R808) / Vernon Avenue.
- Junction 4: Vernon Avenue (R808) / Seafield Road W / Seafield Road E.
- Junction 5: Vernon Avenue (R808) / Clontarf Road (R807).

These were the junctions nearest the Proposed Development which would be affected greatest by the inclusion of the development. Other roads, particularly along R808 which have

not been assessed are considered minor and are primarily residential access to existing developments.

The survey was taken on Thursday 16th September 2021 by 'IDASO'. The AM and PM Peak hours identify were 08:00 – 09:00 and 17:00 – 18:00 respectively.

Trip generation calculation for the proposed, committed, and potential future developments are presented later in this Chapter.

As recommended in the TII Publication, 'Project Appraisal Guidelines Unit 16.1: Expansion Factors for Short Period Traffic Counts (October 2016)', the traffic count data has been converted to Annual Average Daily Traffic (AADT) data in order to provide a dataset representative of the annual traffic flow profile for the road network surrounding the Proposed Development.

The General Expansion Factor Method, as outlined in the TII Publication, was used to convert the surveyed flows for the 4 No. junctions into the Annual Average Daily Traffic (AADT). The corresponding Factors for the Greater Dublin Region were used.

The AADT flows are shown below in Tables 12.1, 12.2, 12.3 and 12.4.

Table 12-1 Junction 1 - Sybil Hill Road (R808) / Howth Road (R105).

Hour Ending	Proportion of Daily Traffic	Existing Two-way Flows through Junction 1 (Vehicles)
08:00	0.077	1318
09:00	0.081	2296
10:00	0.066	1630
16:00	0.069	1820
17:00	0.083	2084
18:00	0.088	2024
Total	0.464	11,172

24 Hour Estimate = $6,121/0.382 = 24,078$ vehicles

Weekly Average Daily Traffic (WADT) = $24,078 \times 0.99 = 23,837$ vehicles

Annual Average Daily Traffic (AADT) = $23,837 \times 0.97 = \mathbf{23,122}$ vehicles

Table 12-2: Junction 2 - Sybil Hill Road (R808) / St. Pauls Access Road

Hour Ending	Proportion of Daily Traffic	Existing Two-way Flows through Junction 2 (Vehicles)
08:00	0.077	296
09:00	0.081	716
10:00	0.066	471
16:00	0.069	683
17:00	0.083	588
18:00	0.088	607
Total	0.464	3,361

24 Hour Estimate = $3,361/0.464 = 7,244$ vehicles

Weekly Average Daily Traffic (WADT) = $7,244 \times 0.99 = 7,171$ vehicles

Annual Average Daily Traffic (AADT) = $7,171 \times 0.97 = \mathbf{6,956}$ vehicles

Table 12-3: Junction 3 - Sybil Hill Road (R808) / Vernon Avenue.

Hour Ending	Proportion of Daily Traffic	Existing Two-way Flows through Junction 3 (Vehicles)
08:00	0.077	437
09:00	0.081	916
10:00	0.066	651
16:00	0.069	784
17:00	0.083	805
18:00	0.088	918
Total	0.464	4,511

24 Hour Estimate = $4,511/0.464 = 9,722$ vehicles

Weekly Average Daily Traffic (WADT) = $9,722 \times 0.99 = 9,625$ vehicles

Annual Average Daily Traffic (AADT) = $9,625 \times 0.97 = \mathbf{9,336}$ vehicles

Table 12-4: Junction 1 - Sybil Hill Road (R808) / Howth Road (R105).

Hour Ending	Proportion of Daily Traffic	Existing Two-way Flows through Junction 4 (Vehicles)
08:00	0.077	110
09:00	0.081	337
10:00	0.066	872
16:00	0.069	731
17:00	0.083	791
18:00	0.088	816
Total	0.464	3,657

24 Hour Estimate = $3,657/0.464 = 7,882$ vehicles

Weekly Average Daily Traffic (WADT) = $7,882 \times 0.99 = 7,803$ vehicles

Annual Average Daily Traffic (AADT) = $7,803 \times 0.97 = 7,569$ vehicles

Table 12-5 | Junction 5 - Vernon Avenue (R808) / Clontarf Road (R807).

Hour Ending	Proportion of Daily Traffic	Existing Two-way Flows through Junction 4 (Vehicles)
08:00	0.077	887
09:00	0.081	1376
10:00	0.066	1254
16:00	0.069	1401
17:00	0.083	1426
18:00	0.088	1440
Total	0.464	7,784

24 Hour Estimate = $4,563/0.382 = 16,776$ vehicles

Weekly Average Daily Traffic (WADT) = $16,776 \times 0.99 = 16,608$ vehicles

Annual Average Daily Traffic (AADT) = $16,608 \times 0.97 = 16,110$ vehicles

12.1.3.5 Pedestrian and Cycling Facilities

The site is well located to provide non-car access for residents and visitors of the Proposed Development with good local walk-in access from the local catchment. There are pathways along Sybil Hill Road separated by the road with a grass verge.

Surrounding the Proposed Development are several areas of cycle lanes. These cycle lanes are along Howth Road to the North of the development. It is a combination of Bus Lane and Cycle Lane (within Bus Lane). This cycle lane continues into the city centre and north towards Howth.



Figure 12-4: Existing Cycle Network

Proposals for the Greater Dublin Area Cycle Network Plan were published by the National Transport Authority in December 2013. The plan sets out a vision and a strategy for the construction and/or designation of a comprehensive network of cycling routes throughout the Greater Dublin Area (Counties Dublin, Meath, Kildare and Wicklow).

Directly North of the Proposed Development is a primary road which continues towards the city centre. There will be new secondary routes to the west and south of the development that connect to two Greenways, these are the Santry River Greenway which leads to the North and the East Coast Trail which travels south towards the city centre.



Figure 12-5: New GDA Cycle Network

12.1.3.6 Public Transport Facilities

12.1.3.6.1 Train Services

The Proposed Development is also served by the Harmonstown Dart Station and Killester Dart Station. This provides access to several areas in North and South Dublin. It is approximately 800m (c. 10-minutes walking) from the Proposed Development to Harmonstown Dart Station and 950m (c. 12-minutes walking or c. 4-minutes cycling) to Killester Dart Station. Figure 4 below shows the location of the dart dation relative to the Proposed Development.



Figure 12-6: Location of the nearest Dart Station

12.1.3.6.2 Bus Services

The Proposed Development is served by four bus stops with the local area. The nearest bus stops are to the north of the development on R105 Howth Road. Bus Stop 709 serves buses traveling away from the City Centre and serves the bus routes 6, H1, H2, H3 while Bus Stop 606 serves buses travelling towards the City Centre and serves the bus routes 6, H1, H2, H3. Bus Stop 709 is approximately 400m (c. 5-minute walk) away from the Proposed Development entrance and Bus Stop 606 is 450m (c. 6-minute walk) away.

There two bus stops near the Proposed Development on Vernon Avenue these are the Bus Stop 7607 and Bus Stop 1651, and both stops serve the 104 Bus route in opposite directions. Bus Stop 709 is approximately 400m (c. 5-minute walk) away from the Proposed Development entrance and Bus Stop 606 is 450m (c. 6-minute) away.

Table 12-6 and Figure 12-7 show the timetable of each bus stop and the locations respectively.

Table 12-6: Existing Bus Network

Bus No.	Route	Weekday Frequency	Saturday Frequency	Sunday Frequency
6	Howth Station towards Abbey Street Lower	30 - 60 mins	60 mins	60 mins
	Abbey Street Lower toward Howth Station	30 - 60 mins	60 mins	60 mins
H1	Baldoyle towards Abbey Street Lower	15 mins	20 mins	15 – 30 mins
	Abbey Street Lower towards Baldoyle	15 mins	20 mins	15 – 30 mins
H2	Malahide towards Abbey Street Lower	30 mins	40 mins	60 mins
	Abbey Street Lower towards Malahide	30 mins	40 mins	60 mins
H3	Howth Summit towards Abbey Street Lower	30 mins	40 mins	60 mins
	Abbey Street Lower towards Howth Summit	30 mins	40 mins	60 mins
104	Clontarf Station towards DCU	60 mins	-	-
	DCU towards Clontarf Station	60 mins	-	-



Figure 12-7: Location of the nearest Bus Stops

12.1.3.6.3 Bleeper Bikes

Bleeper Bikes is a new service where users can rent bikes for short term use throughout the city. The bleeper bikes operate in a 100 km² zone where bikes must be parked after use using the designated parking spots and the app. As can be seen in the figure below, bleeper bikes provide the Proposed Development access to several areas in the city including Malahide, Howth, City Centre, Blanchardstown, Dun Laoghaire and Rathmines.

A Bleeper Bike can be locked at any Sheffield Bike Rack provided it is on public property and it is located within our Operating Zone. Public cycle parking is available within St. Anne's Park.

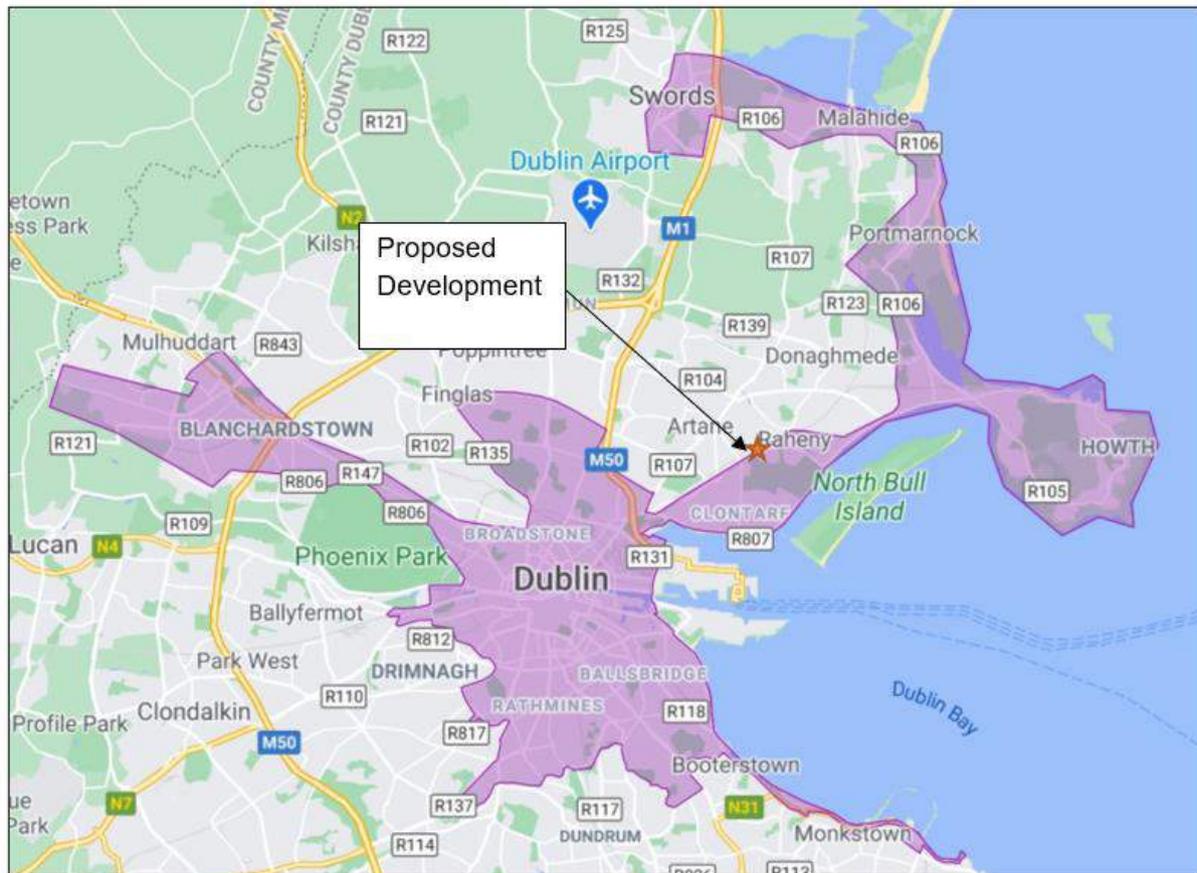


Figure 12-8: Bleeper Bikes Map

12.1.3.6.4 Go Car

GoCar is a service for quickly renting cars for short term use. There are GoCar stations all over Ireland available for use. The nearest Go Car is approximately 1km away (c. 12-minute walk) from the Proposed Development. At the time of writing this, there is one car available at this station.

Waterman Moylan have engaged with GoCar about the possibility of introducing car share vehicles within the development. GoCar have provided a letter of intent for the development, which is included in Appendix M.

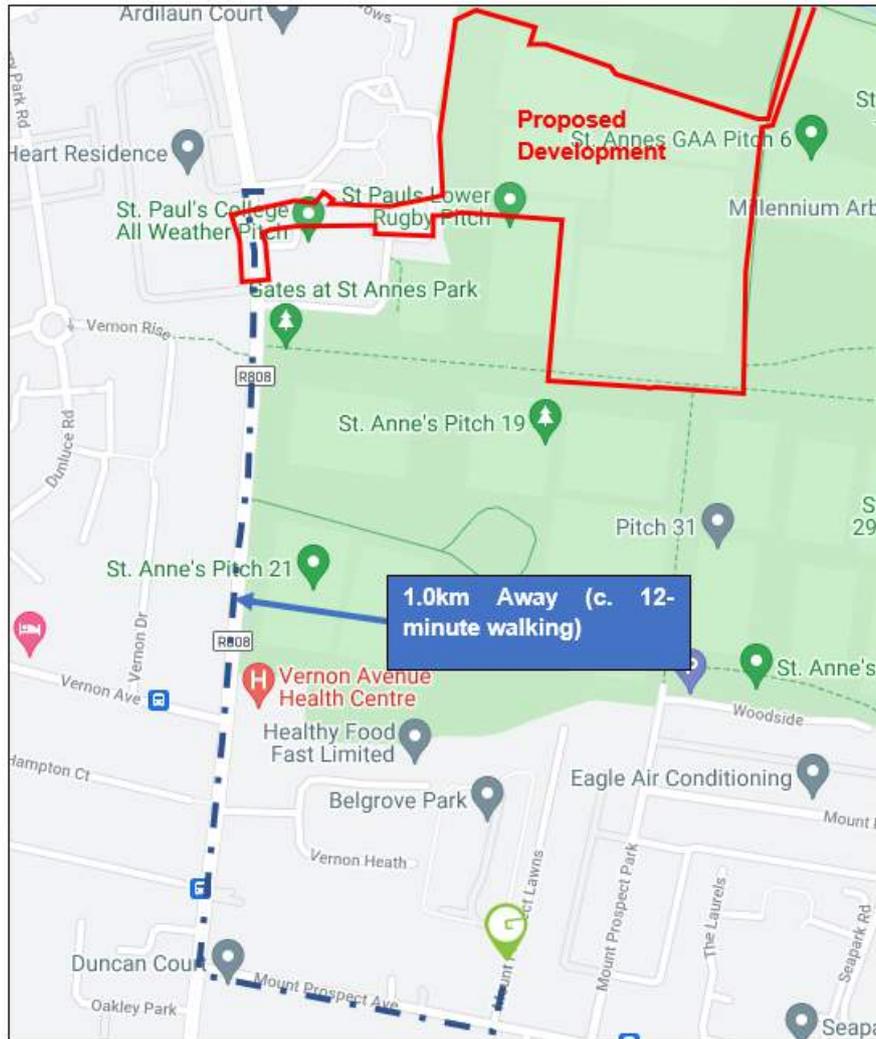


Figure 12-9: Location of the nearest GoCar Station

12.1.3.7 Existing Modal Split

A full breakdown of the population is required for the modal split of the surrounding areas. Census 2016 was carried out by the Central Statistics Office on 24th April 2016.

With the objective to obtain information regarding 'car ownership' and 'modal split for the journey to work, school or college', the existing residential areas surrounding the Proposed Development have been consulted. For the purpose of the 2016 survey, these areas have been divided in 4 Areas. These consulted Small Areas are illustrated in Figure 12-10.

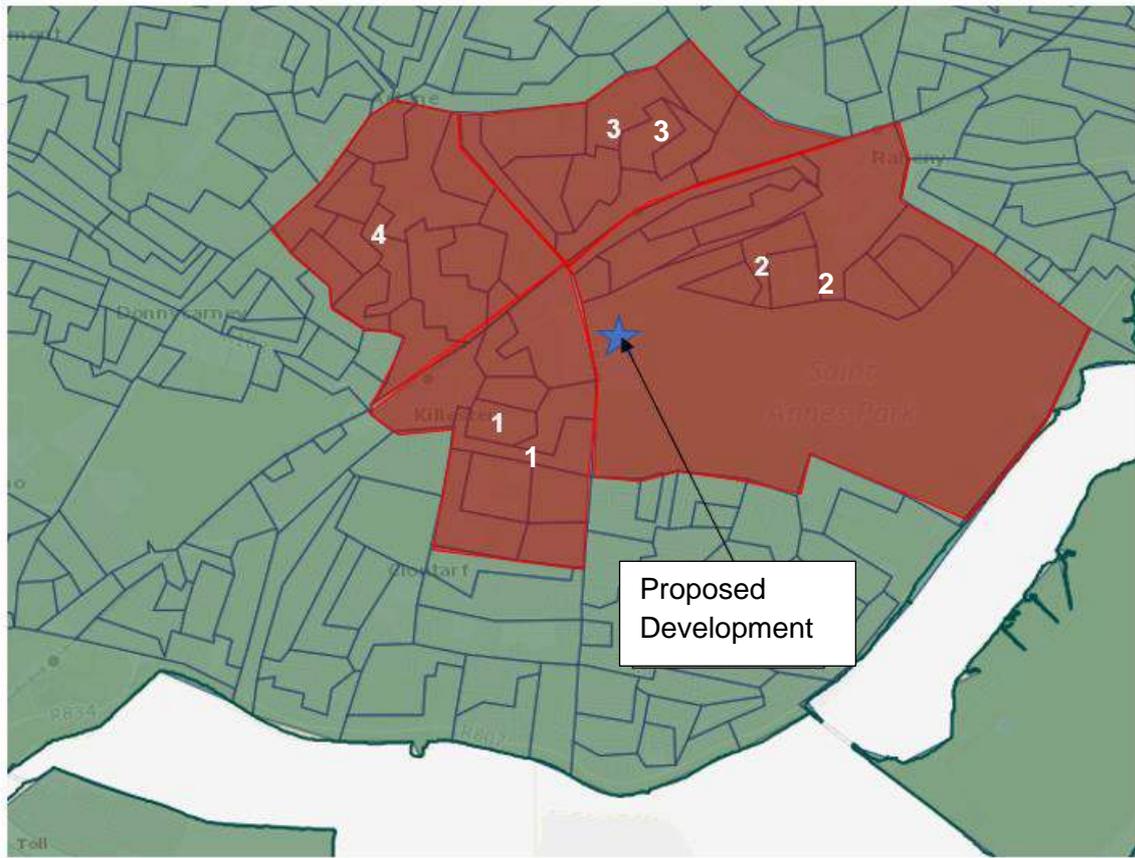


Figure 12-10: SapMap Areas

The existing modal split for the journey to work by the residents at the Small Areas (Zones) as surveyed in Census 2016 is presented in Table 12-7.

Table 12-7: Existing Modal Split Census 2016

Area	Pop.	Trip Attractor	Car Driver	Car Passenger	Train	Bus	Cycle	On Foot	Others or Not Stated	Total
1	2906	Work	607	18	235	85	122	67	29	1163
			52%	2%	20%	7%	10%	6%	2%	100%
		College	17	187	76	77	58	206	5	626
			3%	30%	12%	12%	9%	33%	1%	100%
2	3438	Work	609	29	291	105	136	58	30	1258
			48%	2%	23%	8%	11%	5%	2%	100%
		College	20	152	77	110	47	328	10	744
			3%	20%	10%	15%	6%	44%	1%	100%
3	3442	Work	484	24	255	120	101	64	28	1076
			45%	2%	24%	11%	9%	6%	3%	100%
		College	12	155	52	89	51	220	19	598
			2%	26%	9%	15%	9%	37%	3%	100%
4	2693	Work	504	21	265	160	140	60	37	1187
			42%	2%	22%	13%	12%	5%	3%	100%
		College	13	138	43	80	69	123	23	489
			3%	28%	9%	16%	14%	25%	5%	100%
Total	12,479	Work	2204	92	1046	470	499	249	124	4684
			47%	2%	22%	10%	11%	5%	3%	100%
		College	62	632	248	356	225	877	57	2457
			3%	26%	10%	14%	9%	36%	2%	100%

The surveyed 'modal split for the journey to work, school or college' by the residents at the four consulted areas as surveyed in Census 2016 recorded that 57% of 12,479 population generated 7,141 trips for the journey to work, school or college. Work trips made up for 66% of trips generated in the area, some 49% were by car, 22% by Train, 10% by Bus, 11% by Bicycle, 5% On foot and 3% were others or not stated. College trips made up 34% of the trips

generated in the area, some 29% were by car (26% of these were car passenger), 10% by Train, 14% by Bus, 9% by Bicycle, 36% by Foot, and 2% were others or not stated.

The total existing modal split for each method of commuting is shown below:

- 42% by Car
- 18% by Train
- 12% by Bus
- 10% by Cycle
- 16% by Foot
- 3% by Other/Not Stated

12.1.4 Characteristics of the Proposed Development

12.1.4.1 Introduction

The Proposed Development consists of the construction of a residential and nursing home development set out in 7 no. blocks, ranging in height from 4 to 7 storeys, to accommodate 580 no. apartments, residential tenant amenity spaces, a crèche and a 100-bed nursing home, as set out in the schedule of accommodation below:

Table 12-8: Schedule of Accommodation

Description		1-Bed	2-Bed	3-Bed	Total
Apartment Blocks	Block A	31	25	5	61
	Block B	44	26	-	70
	Block C	46	57	9	112
	Block D	56	58	22	136
	Block E	47	46	3	96
	Block F	23	9	4	36
Mixed-Use (Block G)	Apartments	25	27	17	69
	Nursing Home	100 Bed-Spaces			-
	Crèche	6 Classrooms			-
Total		273	248	60	580

12.1.4.2 Physical Infrastructure

12.1.4.2.1 Internal Road Layout

The internal layout of the Proposed Development will provide pedestrian pathways on both sides of the road, often separated by a grass bank. All footpaths for the Proposed Development will be provided in accordance with Section 4.3.1 of the DMURS which suggests that a minimum 1.8m footpath should be provided. The proposed pathway will connect with the current pedestrian network on Sybil Road.

12.1.4.2.2 Site Access Points

The Proposed Development will use the existing site access to Sybil Hill House access road. This is to the north of the St. Pauls College entrance.

The sightline requirements for a new priority junction on 50kph road are identified within DMURS which recommends a visibility splay of 49m x 2.4m on roads with bus routes. Visibility splay of this junction has been designed in accordance with DMURS requirements Section 4.4.4 'Forward Visibility'. Details of the junction layout can be seen on Waterman Moylan drawings accompanying the documentation package.

There will be an additional pedestrian site access point to the south-west of the development connect to Sybil Hill Road via a pathway.

12.1.4.2.3 Internal Pedestrian and Cyclist facilities

Footpaths within the Proposed Development will be provided in accordance with Section 4.3.1 of the Design Manual for Urban Roads and Streets (DMURS) which suggests that a minimum 1.8m footpath should be provided. Crossing points are located at various points within the development such that unimpeded pedestrian movement is facilitated. Accordingly, the Proposed Development is consistent with the principles outlined in DMURS.

12.1.4.2.4 Cycle Parking

Dublin City Council Development Plan (2016 – 2022) includes cycle parking standards for new developments. The standards are based on three different zones for the purposes of parking control. Zone 1 is generally within the inner-city centre, parking zone 2 is for areas alongside transport corridors and Zone 3 is for all other areas.

The Proposed Development is classified as Zone 2. The bicycle parking requirements for Zone 2 developments are set out in Table 12-9:

Table 12-9 | DCC Development Plan (2016 – 2022)

Unit Type	Standard	No. of Units	Spaces Required
Residential	1 per unit*	580	580
Childcare Facilities (Employment)	1 per 100 sqm	1200 sqm	6
Nursing Home	n/a	-	-
Total			586

**(Additional requirements for larger units and visitor parking will be decided on a case-by-case basis).*

The Design Standards for New Apartments – December 2020 also contains standards for cycle parking. These standards are as follows:

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

The Table below show the requirements for cycle parking and visitor cycle parking based on the Design Standards for New Apartments.

Table 12-10: Design Standards for new Apartments – December 2020

Description	Bicycle Parking Norm		No. of Units Proposed	Required Parking
	Resident's Parking	Visitor Parking		
1-Bed Apt.	1	1 space per 2 units	272	408
2-Bed Apt.	2	1 space per 2 units	248	620
3-Bed Apt.	3	1 space per 2 units	60	210
Total	-	-	580	1,238

It is proposed to provide bicycle parking over and above these requirements, as set out in Table 12-11:

Table 12-11: Proposed Bicycle Parking

Description		Required Parking					Proposed Parking		
		1-Bed	2-Bed	3-Bed	Visitor	Total	Internal	External	Total
Apartment Blocks	Block A	31	50	15	30.5	126.5	-	158	158
	Block B	44	52	-	35	131	-	164	164
	Block C	46	114	27	56	243	-	298	298
	Block D	56	116	66	68	306	306	24	330
	Block E	47	92	9	48	196	-	280	280
	Block F	23	18	12	18	71	84	48	132
Mixed-Use (Block G)	Apartments	25	54	51	34.5	164.5	172	-	172
	Nursing Home	20				20	20	10	30
	Crèche	10				10	-	10	10
Total		272	496	180	290	1,268	582	992	1,574

12.1.4.2.5 Pedestrian Linkages to Surrounding Lands

The Proposed Development is well served by pedestrian networks along Sybil Hill Road. There are signalised pedestrian crossings on Sybil Hill Road to the south of the development at St. Paul's College. There are signalised pedestrian crossings to the north of the development at the junction between Sybil Hill and Howth Road.

12.1.4.3 Trip Generation – Construction Traffic

The construction programme takes place over an 18 month period split over two stages.

- **Stage I:** Site demolition, clearance and preparation work for the construction.
- **Stage II:** Site development and construction. The development includes all associated site works and infrastructure which includes roads, utilities, foul and surface water drainage.

Stage I is expected to take 3 months with the remaining Stage II taking 15 months. The most active stage for construction traffic movements will be the excavation works.

The expected traffic movements during the construction/excavation period will vary significantly from month to month depending on the activities in progress. Determination of the construction traffic movements is based on the assumptions set out below: -

- A 10-hour day between 08h00 and 18h00, conservatively assuming removal trucks will operate Monday – Friday only.
 - Note that these are conservative assumptions to maximise the predicted impact on the surrounding roads – actual working hours at the site are to be agreed with Dublin City Council and will likely be 07:00 – 18:00 Monday to Friday and 08:00 – 14:00 on Saturdays.
- 20 working days per month
- Preliminary computations of the excavation quantity are 86,600m³
- In order for a more robust, conservative assessment, a bulking factor of 25% is applied and therefore 107,500m³ of material will be excavated.
- Carrying capacity of trucks – 15m³
- Based on the volume 107,500m³ there will be total of 7,167 trips in and 7,167 trips out over a 60-day period (3 months).

This gives an average of 119 truck arrivals and 119 truck departures per working day during the busiest 3-month period. Overall, the expected HGV movements during the construction stage are predicted to vary from 100 to 130 departures per day with a peak rate of 25 truck arrivals and 25 truck departures per hour in the AM/PM peak hours.

These movements represent some 1% of the existing traffic flow of the 2000 – 2300 vehicles per hour each way at the junction of Howth Road and Sybil Hill Road.

12.1.4.3.1 Trip Generation - Operational Traffic

In order to assess the likely impacts of the Proposed Development, trips to and from the development were generated using TRICS Database.

TRICS is the national standard of trip generation and analysis in Ireland. It is a database system which allows users to identify representative trip rates and to establish potential levels of trip generation for a wide variety of developments.

TRIC Rates were sourced using version TRICS 7.8.3 and are shown in Table 12-12. Full TRIC Rates are shown in Appendix N.

Table 12-12: TRIC Rates – Proposed Development

Land Use	AM Peak Hour		PM Peak Hour	
	IN	OUT	IN	OUT
Apartments	0.044	0.124	0.083	0.055
Nursing Home	0.094	0.144	0.089	0.139

The Proposed Development as part of the subject application will comprise of a total of 580 no. Apartments, 100 no. unit Nursing Home (4500 sqm) and a creche.

The creche is envisaged to serve residents of the Proposed Development and not many trips are expected to be generated from this during the peak hours. The AM and PM peak hour trip generation to/from the Proposed Development, estimated after the trip rates showed above, is shown in Table 12-6.

Table 12-13: Trip generated – Proposed Development

Land Use	Units	AM Peak Hour		PM Peak Hour	
		IN	OUT	IN	OUT
Apartments	580 Residential Units	26	72	48	32
Nursing Home	100 Nursing Home Units	9	14	9	14
Total	580 Residential Units 100 Nursing Home Units	35	86	57	46

Based on the TRIC Rates shown in Table 12-2, the Proposed Development will generate a total of 119 trips in the AM peak hour period (34 inbound and 85 outbound) and a total of 103 trips in the PM peak hour period (57 inbound and 46 outbound).

12.1.4.3.2 Trip Generation – Construction Traffic

The construction programme takes place over an 18 month period split over two stages.

- **Stage I:** Site demolition, clearance and preparation work for the construction.
- **Stage II:** Site development and construction. The development includes all associated site works and infrastructure which includes roads, utilities, foul and surface water drainage.

Stage I is expected to take 3 months with the remaining Stage II taking 15 months. The most active stage for construction traffic movements will be the excavation works.

The expected traffic movements during the construction/excavation period will vary significantly from month to month depending on the activities in progress. Determination of the construction traffic movements is based on the assumptions set out below: -

- A 10-hour day between 08h00 and 18h00, conservatively assuming removal trucks will operate Monday – Friday only.
 - Note that these are conservative assumptions to maximise the predicted impact on the surrounding roads – actual working hours at the site are to be agreed with Dublin City Council and will likely be 07:00 – 18:00 Monday to Friday and 08:00 – 14:00 on Saturdays.
- 20 working days per month
- Preliminary computations of the excavation quantity are 86,600m³
- In order for a more robust, conservative assessment, a bulking factor of 25% is applied and therefore 107,500m³ of material will be excavated.
- Carrying capacity of trucks – 15m³
- Based on the volume 107,500m³ there will be total of 7,167 trips in and 7,167 trips out over a 60-day period (3 months).

This gives an average of 119 truck arrivals and 119 truck departures per working day during the busiest 3 month period. Overall, the expected HGV movements during the construction

stage are predicted to vary from 100 to 130 departures per day with a peak rate of 25 truck arrivals and 25 truck departures per hour in the AM/PM peak hours.

These movements represent some 1% of the existing traffic flow of the 2000 – 2300 vehicles per hour each way at the junction of Howth Road and Sybil Hill Road.

12.1.4.3.3 Car Parking Provision

Dublin City Council Development Plan (2016 – 2022) contains car parking standards for new developments. The standards are based on three different zones for the purposes of parking control. Zone 1 is generally within the inner-city centre, parking zone 2 is for areas alongside transport corridors and zone 3 is for all other areas.

The Proposed Development is classified as zone 2, as shown in the Figure 12-11:

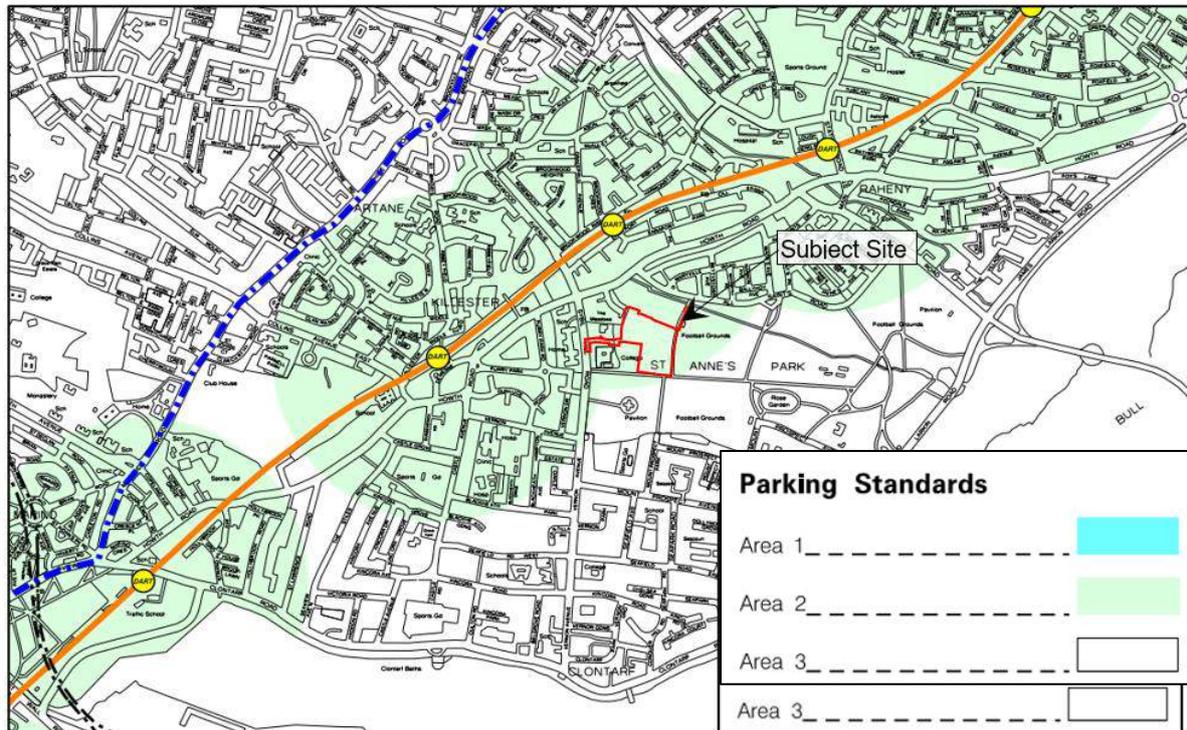


Figure 12-11: Extract of Map J from the Dublin City Development Plan 2016 – 2022

Parking Standards for the development will therefore be based on Area 2 requirements. Table 16.1 of the Development Plan sets out maximum car parking standards for various land uses. The relevant requirements are set out in the Table below (note that no specific figure is provided for crèches/childcare facilities, so the requirement for schools is included instead):

Table 12-14: DCC Development Plan (2016 – 2022)

Description	Car Parking Norm	No. of Units Proposed	Maximum Car Parking
Residential	1 Space per Dwelling	580 Units	580
Nursing Home	1 Space per 2 Patient Beds	100 Bed-Spaces	50
Schools	1 Space per Classroom	6 Classrooms	6
Total	-	-	636

A draft development plan for Dublin City has been made publicly available to view as part of a public consultation period. While this plan has not yet been adopted, the car parking standards set out within it have been assessed to establish the general intention for the future of Dublin City. It is also noted that this plan will be adopted by DCC prior to commencement of the Proposed Development.

Car parking standards are set out in Appendix 5, Section 4, Table 2 of the Draft Dublin City Development Plan 2022-2028. The parking standards are divided into three zones:

- Parking Zone 1 is generally within the Canal Cordon and within North Circular Road, in recognition of active travel infrastructure and opportunities and where major public transport corridors intersect.
- Parking Zone 2 occurs alongside key public transport corridors.
- The remainder of the city falls under Parking Zone 3.

The subject site is outside the Canal Cordon and North Circular Road, but is in close proximity to the Dart and to several bus services, and is therefore alongside key public transport corridors. Parking Zone 2 standards have been reviewed, with the relevant parking standards from the Draft Development Plan tabulated below:

Table 12-15: Draft Dublin City Development Plan 2022-2028 Parking Standards

Land Use Category	Zone 2 Maximum Parking	No. of Units (DCC Lands Only)	Parking Requirement	Max/ Norm?
Apartments	1 per dwelling	580 no. Dwellings	580	Max
Nursing Home	1 per 2 residents	100 Residents	50	Max
Pre-school facilities/crèche	1 per 100m ² GFA	1,073m ²	10	Max
Total	-	-	640	-

The plan states that it is Dublin City Council's policy for car parking in residential and mixed-use developments to provide for sustainable levels of car parking and car storage in residential schemes, in accordance with development plan car parking standards, so as to promote city-centre living and reduce the requirement for car parking, to encourage new ways of addressing the transport needs of residents (such as car clubs and mobility hubs) in order to reduce the requirement for car parking, and to safeguard the residential parking component in mixed-use developments.

Comparing the current Dublin City Development Plan 2016-2022 parking standards with the proposed parking standards set out in the draft Dublin City Development Plan 2022-2028, the car parking requirements for the subject development are almost identical.

The Design Standards for New Apartments – December 2020 also contains car parking standards for new apartments. These standards are based on the location of new development which can be categorised as 'Central and/or Accessible Urban Locations', 'Intermediate Urban Locations' and 'Peripheral and/or Less Accessible Urban Locations'.

The Proposed Development can be described as an Accessible Urban Location under the following criteria.

“These locations are most likely to be in cities, especially in or adjacent to (i.e., within 15 minutes walking distance of) city centres or centrally located employment locations. This includes 10 minutes walking distance of DART; commuter rail or Luas stops or within 5 minutes walking distance of high frequency (min 10-minute peak hour frequency) bus services”.

The Proposed Development is within walking distance of the Dart Station and high frequent bus stops along Howth Road. The standards for an Accessible Urban location are for the car parking provision to be minimised, substantially reduced, or wholly eliminated in certain cases.

Due to the proposed Nursing Home included in the proposed development ambulances will become more common and therefore will need emergency parking within the development. There are two set down spaces just outside the Nursing Home entrance and are in ideal position for an ambulance.

A total of 520 car parking spaces will be provided for the proposed development. A full breakdown of the parking is shown in Table 12-16:

Table 12-16 Car Parking Provided

Description		Proposed Car Parking				
		Standard	Accessible	EV	Dropoff	Total
Apartment Blocks	Block A	41	2	7	1	51
	Block B	45	3	7	1	56
	Block C	75	5	9	-	89
	Block D	93	5	12	3	113
	Block E	64	4	8	-	76
	Block F	23	2	3	1	29
Mixed-Use (Block G)	Apartments	47	2	6	2	57
	Nursing Home	23	9	7	2	41
	Crèche	5	1	-	2	8
Total		416	33	59	12	520

12.1.4.3.4 Trip Distribution

In order to determine the amount of new car trips expected to travel through each surveyed junction in the vicinity of the Proposed Development site, the calculated car trips for the Proposed Development have been distributed. The trip distribution for the AM and PM peak hour generated traffic for the Proposed Development is detailed in Figure 12-12 and the corresponding AM and PM peak hour flows, based on the assumed distribution, are shown in Figure 12-13.

For the purpose of this assessment, it was assumed that 50% of the traffic will travel north on Sybil Hill Road towards Howth Road. Of this 50%, 10% will travel east to/from Howth, 10% will travel north onto/from Brookwood Avenue and the remaining 30% will travel west to/from the City Centre. The other 50% will travel south to/from Sybil Hill Road with 30% of the cars

travelling west to/from Vernon Avenue and the remaining 20% will continue south on Vernon Road with 10% travelling to/from Sea field Road West and the remaining 10% travelling to/from R807 Clontarf Road.

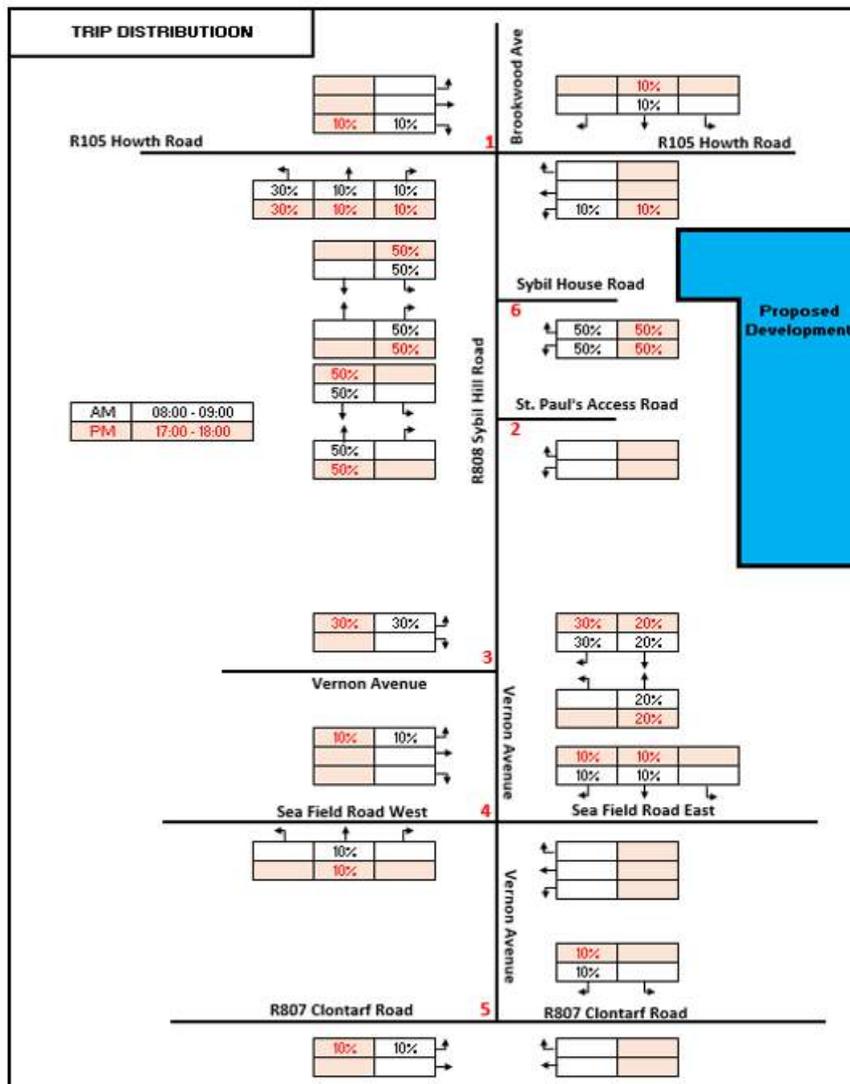


Figure 12-12: Proposed Development – Trip Distribution

Using the trips generated from Table 6 and the trip distribution from Figure 12-12 above, the trips can be assigned to show the impact the Proposed Development will have on the surrounding Road network. Figure 12-13 shows the trip assignment for the Proposed Development.

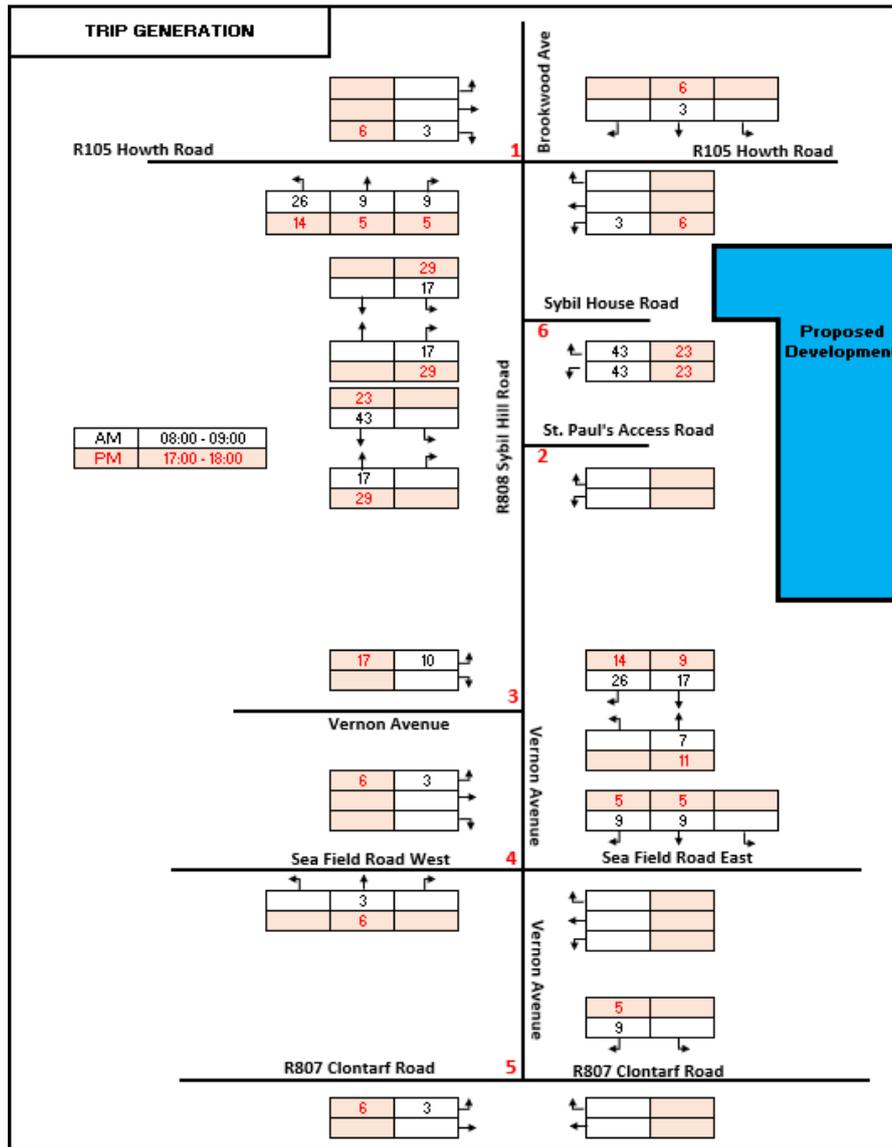


Figure 12-13: Trips generated – Proposed Development

12.1.5 Potential Impact of the Proposed Development

12.1.5.1 Introduction

The potential impacts of the Proposed Development from a traffic and transport perspective at both construction and operational stage are outlined in the following sections.

12.1.5.2 Construction Phase

There is potential for construction traffic to impact from a traffic and transport perspective in relation to the surrounding road network. There is potential for traffic congestion, due to increased heavy good vehicles on the road network which may also perform turning movements, unloading, etc., in areas that impact on traffic. The potential for inappropriate parking whilst waiting for access to the site, may also impact local road users. There is potential for an increase in noise and dust due to the additional construction traffic.

There is potential for construction traffic to have a slight effect on the surrounding environment. However, the duration of this impact will be short-term (i.e., one to seven years).

A detailed construction programme has not been developed at this stage. However, the Proposed Development is to be constructed in two stages which will include, in broad terms, the following:

- Stage I: Site demolition, clearance and preparation work for the construction.
- Stage II: Site development and construction. The development includes all associated site works and infrastructure which includes roads, utilities, foul and surface water drainage.

The construction programme is intended to be an 18-month programme.

12.1.5.3 Haul Routes

There are three preliminary haul routes identified below in the figure below. A description of each haul route is given below. As the preliminary haul routes are assumed to use the M50 or M1 as part of the route, the chosen haul routes do not extend passed the M50/M1 intersection.

Haul Route 1: is approximately 8km long and travels north along Howth Road to Raheny. The route then takes the R809 through Donaghmede to the R139 which connects to the M50/M1 on-ramps.

Haul Route 2: is approximately 7.3km long travelling straight up the R808 to Artane and the R107. The R107 connects to the R139 via Clarehall Junction which connects to the M50/M1 on-ramps.

Haul Route 3: is approximately 6.8km long traveling straight up the R808 to Artane and left at Coolock connecting to the M50 via R104 M50 on-ramp.

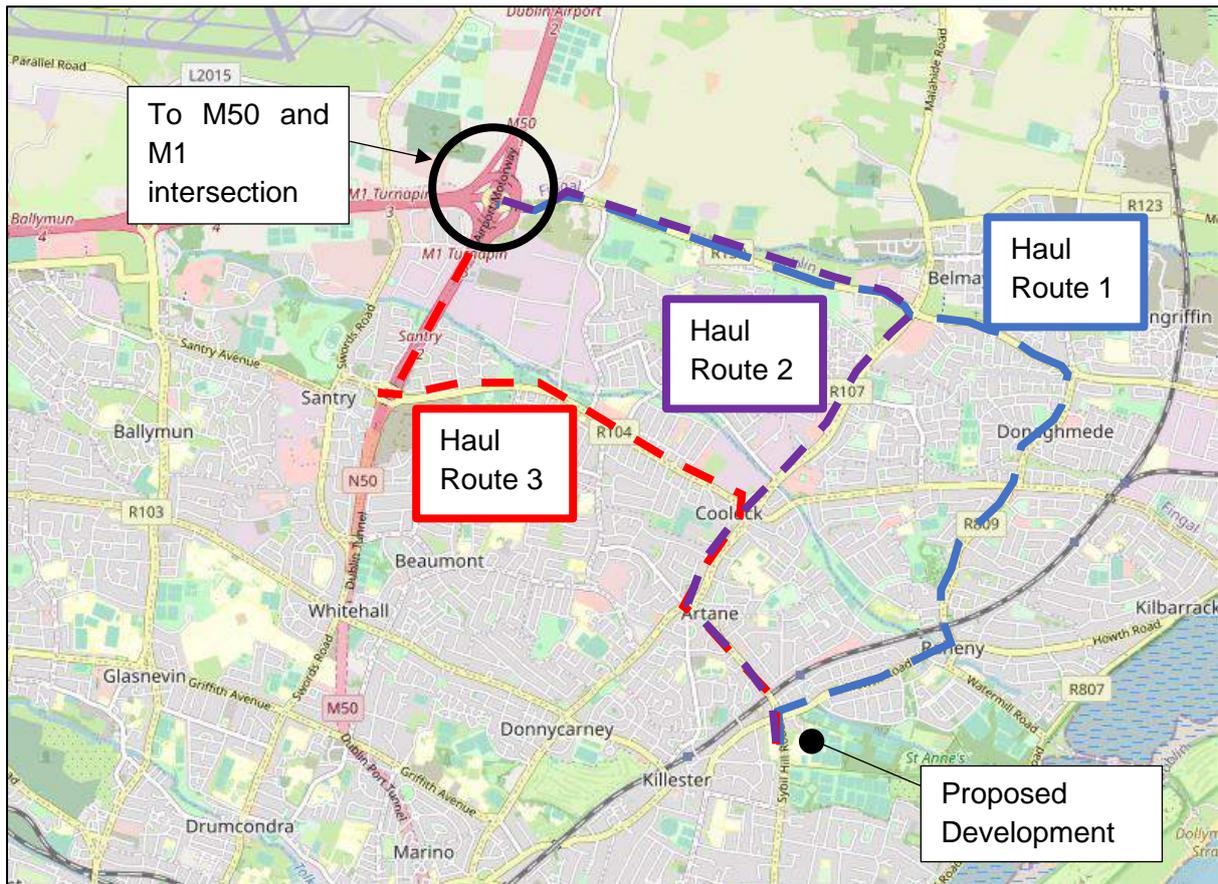


Figure 12-14: Preliminary Haul Routes

12.1.5.4 Operational Phase

The Proposed Development will generate a number of trips by various modes of travel including vehicular, pedestrian, cycle and public transport. These trips may have an impact on the surrounding road network and could contribute to increased congestion.

The traffic during the Operational Phase may also be affected by special events such as summer concerts in St. Anne's Park. During the concerts no car parking will be available for the concert and Sybil Hill Road from Vernon Ave to Howth Road will be closed each evening from 15:00hrs - 23:30hrs (access will be maintained for the proposed development and other residents/services along the road). Temporary closures / diversions will occur post event depending on pedestrian numbers. These will be monitored and managed by An Garda Síochána and Security personnel and will not impinge on local access, wherever possible. Both Gardaí and Stewards will be posted along Sybil Hill Road and the junction with Howth Road.

Traffic count data was obtained for the purposes of the planning application. The data surveyed is expected to reflect the peak traffic conditions on the local road network. An estimation of the traffic generation and distribution of the Proposed Development has been set out in the previous section. This will be compared to the background traffic counts in order to ascertain the impact the Proposed Development will have on the local road network.

A summary of the baseline two-way flows and the two-way flow expected to be generated by the Proposed Development in the local area are presented below in Table 12-17 for junction 1, Table 12-18 for junction 2, Table 12-19 for junction 3, Table 12-20 for junction 4, Table 12-21 for junction 5.

Table 12-17: Junction 1

Description	Total Junction Two Way Flow (Veh)	Proposed Developments Two Way Flow (Veh)	% Traffic increase
AM Peak Hour (08:00 - 09:00)	2296	53	2%
PM Peak Hour (17:00 - 18:00)	2063	40	2%

Table 12-18: Junction 2

Description	Total Junction Two Way Flow (Veh)	Proposed Developments Two Way Flow (Veh)	% Traffic increase
AM Peak Hour (08:00 - 09:00)	711	60	8%
PM Peak Hour (17:00 - 18:00)	599	52	9%

Table 12-19: Junction 3

Description	Total Junction Two Way Flow (Veh)	Proposed Developments Two Way Flow (Veh)	% Traffic increase
AM Peak Hour (08:00 - 09:00)	916	60	7%
PM Peak Hour (17:00 - 18:00)	918	52	6%

Table 12-20: Junction 4

Description	Total Junction Two Way Flow (Veh)	Proposed Developments Two Way Flow (Veh)	% Traffic increase
AM Peak Hour (08:00 - 09:00)	872	24	3%
PM Peak Hour (17:00 - 18:00)	816	21	3%

Table 12-21: Junction 5

Description	Total Junction Two Way Flow (Veh)	Proposed Developments Two Way Flow (Veh)	% Traffic increase
AM Peak Hour (08:00 - 09:00)	1375	12	1%
PM Peak Hour (17:00 - 18:00)	1440	11	1%

12.1.5.4.1 Public Transport Capacity Impact

In order to assess all potential impacts of the Proposed Development, a public transport assessment was prepared by Waterman Moylan. The full report is included in Appendix O.

The results of the public transport capacity assessment show the potential impact of the Proposed Development to be not significant based on the spare capacity of both the nearest bus stop and dart stations.

12.1.5.4.2 Junction Assessment Impact

In order to assess the potential impact arising from the Proposed Development during the operational phase, a Traffic and Transport Assessment has been prepared and is included in the SHD application under a separate cover. The traffic modelling carried out as part of the Traffic and Transport Assessment includes the analysis of 3 no. Junctions of the surrounding network as set out below.

- Junction 2: Sybil Hill Road (R808) / St. Pauls Access Road
- Junction 3: Sybil Hill Road (R808) / Vernon Avenue.
- Junction 6: Sybil Hill Road (R808) / Sybil House Road (Site Access Road)

12.1.5.4.3 Traffic Growth Factors

These junctions were assessed for the estimated opening year of 2025 and future design years of 2030 (Opening Year + 5 Years) and 2040 (Opening Year + 15 Years). The background traffic growth factors used to factor up the baseline traffic movements are in accordance with the 'Table 6.1: Link-Based Growth Rates: Metropolitan Area Annual Growth Rates' within the TII Publications – Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (May 2019). These are:

- 1.066 (Central Growth) growth factor from 2021 to 2025.
- 1.156 (Central Growth) growth factor from 2021 to 2030.
- 1.210 (Central Growth) growth factor from 2021 to 2040.

12.1.5.4.4 Committed and Potential Future Developments

At the time of writing this, there are no committed or potential future developments within the area that will impact the surrounding background traffic.

12.1.5.4.5 Forecast Traffic – 2040

The forecast traffic on the surrounding road network in 2040 is presented in Figure 12-14 below. This was obtained by factoring up the baseline traffic shown earlier in this section and adding the traffic movements from the Proposed Development.

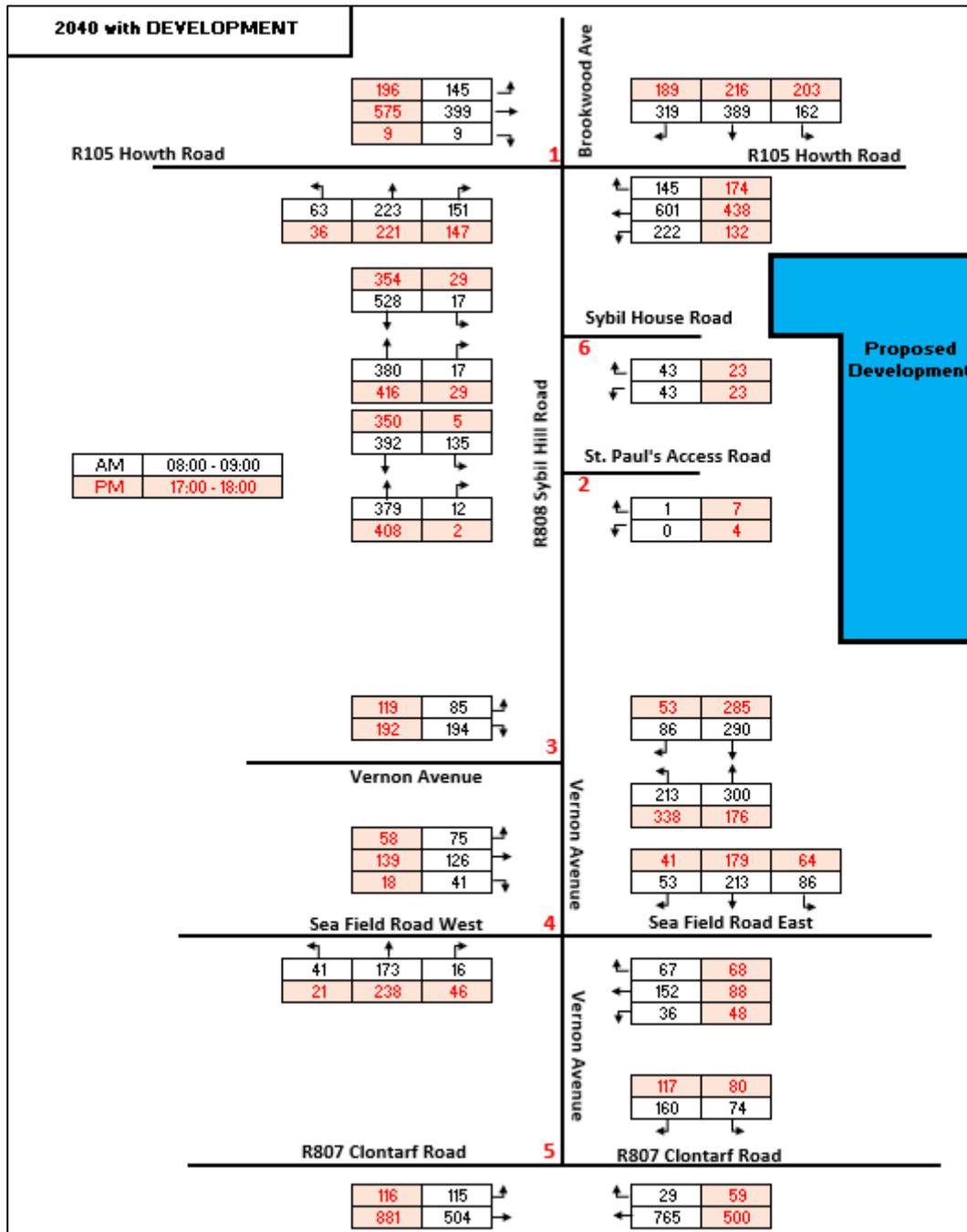


Figure 12-15: Scenario – 2040

12.1.5.5 Modelling Background

There are various modelling software packages available to assess every type of junction. Waterman Moylan uses TRANSYT and PICADY to analyse signalised and priority junctions, respectively.

TRANSYT (Traffic Network Study Tool) software is a widely accepted software for modelling signalised controlled junctions. This programme utilises the phases input by the user and optimises their timings over a cycle time. The outputs of a TRANSYT assessment include a Degree of Saturation percentage (DOS%) figure and queue length for each link on the road network.

PICADY is a software for modelling priority-controlled junctions. This programme utilises junction's geometry and traffic flows input by the user to determine Ratio of Flow to Capacity (RFC) and queue length for each link on the junction.

Typically, a junction is said to be working satisfactorily when the DOS% or RFC of each link does not exceed 90%/0.9. Acceptable DOS% or RFC values are considered to be in the range of 80%/0.8 to 100%/1.0 with higher values indicating restrained movements.

In terms of the EIAR assessment, the potential impacts of the Proposed Development on each junction will be assessed by the RFC/DOS value. A large increase in RFC or DOS over 90% would indicate a moderate effect while minimum change would be considered a imperceptible or not significant effect.

12.1.5.6 Modelling Results

A summary of the results of the modelling carried out as part of the Traffic and Transport Assessment is provided below.

12.1.5.6.1 Junction 2: Sybil Hill Road (R808) / St. Pauls Access Road

Junction 2 is an existing priority T-junction between Sybil Hill and St. Pauls College. This junction has been modelled based on its current configuration in PICADY. Table 8 below shows the junction analysis results. The arms of the junction are labelled as followed:

- Arm A: Sybil Hill (N)
- Arm B: St. Pauls College
- Arm C: Sybil Hill (S)

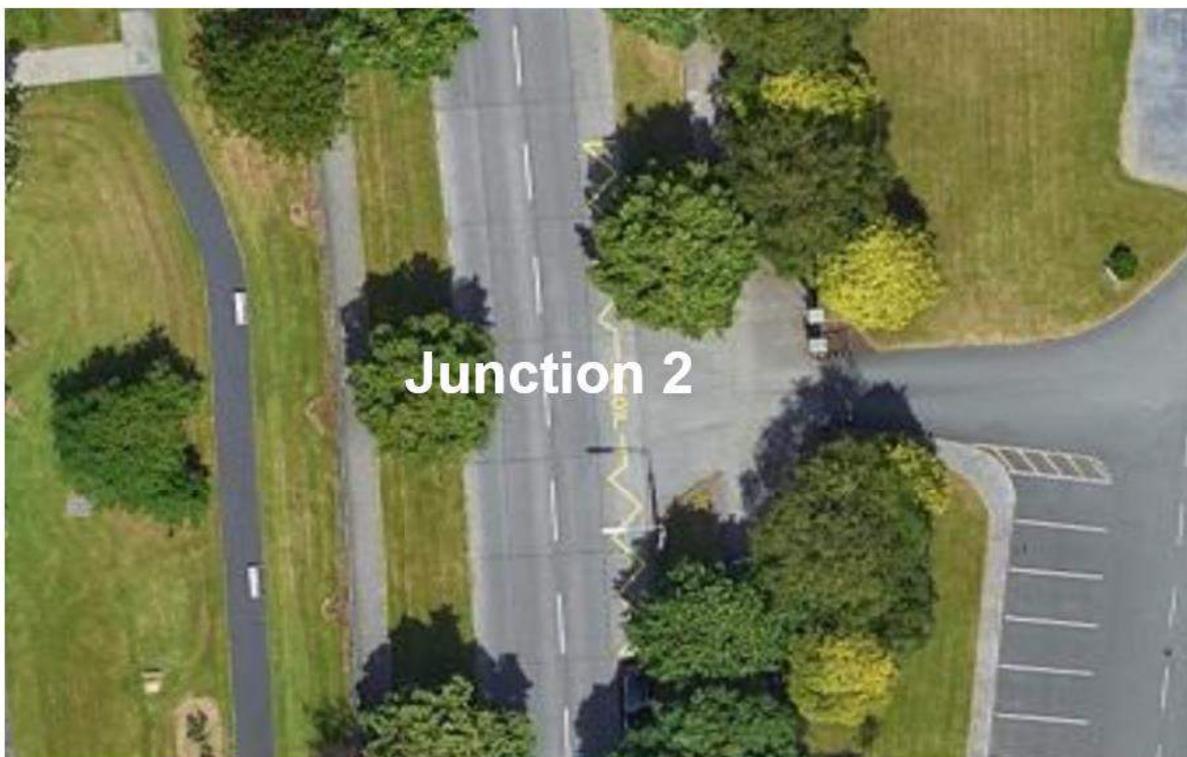


Figure 12-16: Junction 2 – Sybil Hill Road / St. Pauls Access Road

Table 12-22: Junction 2 – PICADY Analysis Results

Traffic Survey 2021						
Stream	AM Peak Hour			PM Peak Hour		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
Stream B – C	0	0	0	0	6.87	0.01
Stream B – A	0	0	0	0	9.07	0.02
Stream C – AB	0	4.8	0.02	0	4.59	0
DO NOTHING 2025						
Stream	AM Peak Hour			PM Peak Hour		
	Queue (Veh.)	Delay (S)	DOS %	Queue (Veh.)	Delay (S)	DOS %
Stream B – C	0	0	0	0	6.92	0.01
Stream B – A	0	0	0	0	9.24	0.02
Stream C – AB	0	4.77	0.02	0	4.55	0
DO NOTHING 2040						
Stream	AM Peak Hour			PM Peak Hour		
	Queue (Veh.)	Delay (S)	DOS %	Queue (Veh.)	Delay (S)	DOS %
Stream B – C	0	0	0	0	7.05	0.01
Stream B – A	0	0	0	0	9.64	0.02
Stream C – AB	0	4.77	0.02	0	4.55	0
DO SOMETHING 2025						
Stream	AM Peak Hour			PM Peak Hour		
	Queue (Veh.)	Delay (S)	DOS %	Queue (Veh.)	Delay (S)	DOS %
Stream B – C	0	0	0	0	6.92	0.01
Stream B – A	0	0	0	0	9.24	0.02
Stream C – AB	0	4.77	0.02	0	4.55	0
DO SOMETHING 2040						
Stream	AM Peak Hour			PM Peak Hour		
	Queue (Veh.)	Delay (S)	DOS %	Queue (Veh.)	Delay (S)	DOS %
Stream B – C	0	0	0	0	7.05	0.01
Stream B – A	0	0	0	0	9.64	0.02
Stream C – AB	0	4.72	0.03	0	4.47	0.01

Junction 2 will remain well under capacity for the DO SOMETHING 2040 scenario with the highest RFC of 0.03 and a corresponding queue of 0.0 vehicles in the AM peak hour and the highest RFC of 0.02 and a corresponding queue of 0.0 vehicles.

It should be noted that during the AM Peak Hour, the school has a dropdown zone along Sybil Hill near the junction. However, the junction is well under capacity and the potential impact would be considered imperceptible.

12.1.5.6.2 Junction 3: Sybil Hill Road (R808) / Vernon Avenue.

Junction 3 is an existing signalised T-junction between Sybil Hill Road and Vernon Avenue. The junction has been modelled based on its current configuration in TRANSYT. Table 8 below shows the junction analysis results. The arms of the junction are labelled as followed:

- Arm A: Vernon Ave. (S)
- Arm B: Vernon Ave. (E)
- Arm C: Sybil Hill



Figure 12-17: Junction 3 – Sybil Hill Road/Vernon Ave.

Table 12-23: Junction 3 - TRANSYT Analysis Results

Traffic Survey 2021							
Arm	Movement	AM Peak Hour			PM Peak Hour		
		Queue (Veh.)	Delay (S)	DOS %	Queue (Veh.)	Delay (S)	DOS %
A	S/L	9.05	24.84	55	9.12	25.75	56
B	L/R	5.96	42.29	59	6.42	40.38	59
C	S/R	7.09	37.82	59	6.67	38.3	58
DO NOTHING 2025							
Arm	Movement	AM Peak Hour			PM Peak Hour		
		Queue (Veh.)	Delay (S)	DOS %	Queue (Veh.)	Delay (S)	DOS %
A	S/L	10.12	26.84	60	10.05	26.73	60
B	L/R	6.44	43.81	63	6.95	41.88	63
C	S/R	7.56	37.46	60	7.26	39.57	62
DO NOTHING 2040							
Arm	Movement	AM Peak Hour			PM Peak Hour		
		Queue (Veh.)	Delay (S)	DOS %	Queue (Veh.)	Delay (S)	DOS %
A	S/L	12.49	30.87	70	12.63	32.2	72
B	L/R	7.5	45.19	68	8.06	43.22	68
C	S/R	8.96	40.61	69	8.47	40.97	67
DO SOMETHING 2025							
Arm	Movement	AM Peak Hour			PM Peak Hour		
		Queue (Veh.)	Delay (S)	DOS %	Queue (Veh.)	Delay (S)	DOS %
A	S/L	10.77	29.48	65	10.8	29.53	65
B	L/R	6.85	44.99	65	7.41	41.47	64
C	S/R	8.72	37.22	65	7.9	39.63	64
DO SOMETHING 2040							
Arm	Movement	AM Peak Hour			PM Peak Hour		
		Queue (Veh.)	Delay (S)	DOS %	Queue (Veh.)	Delay (S)	DOS %
A	S/L	13.36	34.61	75	13.12	32.93	73
B	L/R	7.95	46.57	70	8.76	45.34	72
C	S/R	10.2	40.55	72	9.46	43.47	72

Junction 9 will remain under capacity for the DO SOMETHING 2040 scenario with a DOS of 75% and a corresponding queue of 13.36 vehicles in the AM peak hour period and a DOS of 73% and a corresponding queue 13.12 vehicles.

While there is an increase in DOS% the overall potential impact of the Proposed Development on the junction can be considered not significant because the junction does not exceed the capacity limit.

12.1.5.6.3 Junction 6: Sybil Hill Road (R808) / Sybil House Road (Site Access Road)

Junction 6 is an existing priority junction between Sybil Hill Road and gated site access to Sybil House. As part of the Proposed Development this will be used as the site access point. This junction has been modelled based on its current configuration in PICADY. Table 10 below shows the junction analysis results. The arms of the junction are labelled as followed:

- Arm A: Sybil Hill (N)
- Arm B: Sybil House Access Road
- Arm C: Sybil Hill (S)



Figure 12-18: Junction 6 – Sybil Hill Road / Sybil House Access Road

Table 12-24: Junction 6 - PICADY Analysis Results

DO SOMETHING 2025						
Stream	AM Peak Hour			PM Peak Hour		
	Queue (Veh.)	Delay (S)	RFC	Queue (Veh.)	Delay (S)	RFC
Stream B - C	0.1	7.23	0.09	0	6.39	0.04
Stream B – A	0.2	12.14	0.14	0.1	10.68	0.07
Stream C - AB	0	7.93	0.04	0.1	7.7	0.06
DO SOMETHING 2030						
Stream	AM Peak Hour			PM Peak Hour		
	Queue (Veh.)	Delay (S)	RFC	Queue (Veh.)	Delay (S)	RFC
Stream B - C	0.1	7.47	0.09	0	6.46	0.04
Stream B – A	0.2	12.99	0.15	0.1	11	0.07
Stream C - AB	0	8.16	0.04	0.1	7.79	0.06
DO SOMETHING 2040						
Stream	AM Peak Hour			PM Peak Hour		
	Queue (Veh.)	Delay (S)	RFC	Queue (Veh.)	Delay (S)	RFC
Stream B - C	0.1	7.57	0.09	0	6.51	0.04
Stream B – A	0.2	13.34	0.15	0.1	11.71	0.08
Stream C - AB	0	8.25	0.04	0.1	7.84	0.07

Junction 6 will remain under capacity if used as the site access junction for the Proposed Development for the year 2040 with the highest RFC of 0.09 and a corresponding queue of 0.1 vehicles in the AM peak hour period and an RFC of 0.04 and a corresponding queue of 0.0 vehicles

Junction 6 is the site access junction and therefore the impact will be considered not significant due to the low values of the RFC for DO SOMETHING.

12.1.5.7 Summary

The analysis of the road network surrounding the Proposed Development has shown that the existing and proposed junctions will operate within satisfactory capacities for the future assessed 2040 + development with acceptable DOS%/RFC and queue lengths. Whilst the surrounding road network can cater for the Proposed Development, the increase in traffic over the baseline condition will result in a not significant impact on the surrounding roads network.

12.1.5.8 "Do Nothing" Scenario

Should the Proposed Development not take place, the access roads and infrastructure will remain in their current state and there will be no change. Background traffic would be expected to grow over time.

12.1.6 Avoidance, Remedial & Mitigation Measures

12.1.6.1 Introduction

This section of the report discusses mitigation measures to reduce the impact the Proposed Development on the surrounding area during the construction and operational phases.

12.1.6.2 Construction Phase

It is considered that a Construction Management Plan (CMP) will be prepared by the appointed contractor in order to minimise the potential impact of the construction phase of the Proposed Development on the safety and amenity of other users of the public road. The CMP will consider the following aspects:

- Dust and dirt control measures.
- Noise assessment and control measures
- Routes to be used by vehicles
- Working hours of the site
- Details of construction traffic forecasts
- Time when vehicle movements and deliveries will be made to the site
- Facilities for loading and unloading
- Facilities for parking cars and other vehicles
- Signage at site access.

A Preliminary Construction, Demolition & Waste Management Plan has been included under a separate cover and includes preliminary mitigation measures. Preliminary measures include:

- Parking will be provided on site. No on-street parking or parking in the local residential areas will be permitted;
- Minimise the volume of material removed from site by optimising the cut to fill requirements within the site in order to reduce construction traffic require;
- A dedicated material storage area will be set up on the site.
- Peak construction traffic and deliveries will occur outside the peak traffic hours for peak traffic and also outside opening and closing times of the school.

Due to the volume of excavation material required (107,500m³) and the large daily number of HGVs required. It is proposed to store excavated material on-site and increase the phasing programme of removing excavated material from the site. The excavation process will remain unchanged, but the removal of excavated material will now be 8-months. This will decrease the daily traffic numbers and reduce the impact of the construction phase on the surrounding network.

Further to the above, a detailed Traffic Management Plan (TMP) will be prepared by the Main Contractor. This document will outline proposals in relation to construction traffic and associated construction activities that impact the surrounding roads network. The document will be prepared in coordination and agreed with the local authority.

The Main Contractor will be required to schedule delivery of materials strictly on a daily basis. As there are adequate storage facilities available on site it is not envisaged that there will be any necessity to provide a secure material staging compound remote from the site in which to temporarily store materials from suppliers until such time as these can be accommodated on site. Instead, a dedicated material storage area will be set up on the site.

Care will be taken to ensure existing pedestrian and cycling routes are suitably maintained or appropriately diverted as necessary during the construction period, and temporary car parking is provided within the site for contractor's vehicles.

It is likely that construction will have a not significant impact on pedestrian and cycle infrastructure. This is because the site is approximately 150m away from the main road and pedestrian pathways. There will be short term effects to the pedestrian and cycle infrastructure at the site access point. Mitigation measures such as specific haul routes and haul times avoiding the peak traffic hours will help reduce the impact of the Construction Phase.

12.1.6.3 Operational Phase

The Proposed Development is situated adjacent to suitable infrastructure and transport services for travel by sustainable modes. A key barrier to modal shift towards sustainable modes of travel is often a lack of information about potential alternatives to the car. As such, it is proposed that residents will be made aware of potential alternatives including information on walking, cycle routes and public transport.

Residents will be encouraged to avail of these facilities for travel to and from work. Provision of this information would be made during the sales process and will be included in the new homeowner's pack upon the sale of each unit, as this represents the best opportunity to make residents aware and to secure travel behaviour change. It is anticipated that this measure may help to reduce the level of traffic at the Proposed Development, thus providing mitigation against any traffic and transport effects of the development.

A Travel Plan has been included in this application under separate cover. This Plan sets out methods to reduce the dependence on private car journeys and to encourage residents within the Proposed Development to avail of sustainable forms of transport such as walking, cycling and public transport.

As part of the DCC Draft Development Plan 2022 – 2028, a current and target mode share has been included for the whole DCC Area. This modal split is based on addressing climate change through sustainable mobility.

The current Mode Share available (2019) for the DCC area is broken down as follows:

- Walking – 11%
- Cycling – 6%
- Public Transport (bus, rail, LUAS) – 54%
- Private Vehicles (car, taxi, goods, motorcycles) – 29%

This is for the whole DCC area and therefore the existing modal split in Section 8.2 must also be taken into account.

The Target Modal Split for DCC lands is outlined below.

- Walking: 13%
- Cycling: 13%
- Public Transport (bus, rail, LUAS): 57%*
- Private Vehicles (Car, taxi, goods, motorcycles): 17%

*The increase in public transport mode share anticipates the construction of major public transport infrastructure that is proposed to occur over the lifetime of the plan. The impact of public transport infrastructure projects on mode share is more likely to come into fruition during the lifespan of the following plan.

This target modal split for the subject area surrounding the Proposed Development will differ from the DCC Target split due to the location of the development. The Proposed Development target split proposed is as follows:

- Walking: 15%
- Cycling: 25%
- Public Transport (bus, rail, LUAS): 40%
- Private Vehicles (Car, taxi, goods, motorcycles): 20%

This modal split heavily encourages cycling as the Proposed Development is close to Dublin city centre and with the introduction of the GDA Cycle Network Plan commuting by bicycle will be significantly easier.

12.1.6.4 “Worst Case” Scenario

The “worst case” scenario for the Proposed Development is the final assessment year 2040 (opening year + 15 years). Background traffic will continue to grow and including the potential traffic generated from the Proposed Development will be the “worst case” for the junction analysis.

12.1.7 Residual Impacts

12.1.7.1 Introduction

The predicted impacts of the Proposed Development from a traffic and transport perspective at both construction and operational phases are outlined in the following sections.

12.1.7.2 Construction Phase

Provided the above mitigation measures and management procedures outlined in the Construction Management Plan are incorporated during the Construction Phase, the residual impact upon the local receiving environment is predicted to be short-term (i.e. one to seven years) in the nature and slight in terms of effect.

The storage of excavated material and extending the removal of excavated material to 8-months will help reduce the daily HGV traffic. Based on the volume 107,500m³ there will be total of 7,167 trips in and 7,167 trips out over a 160-day period (8 months). This gives an average of 48 truck arrivals and 48 truck departures per working day during the busiest period. Overall, the expected HGV movements during the construction stage are predicted to vary from 30 to 60 arrivals per day and 30 to 60 departures per day, with a peak rate of up to 4 truck arrivals and 4 truck departures per hour in the AM/PM peak hours.

Through the implementation of preliminary mitigation measures it is anticipated that the effect of traffic during the construction phase will have a slight effect on the surrounding road network for short-term period. These are preliminary measures and a detail CMP and CTMP will be provided the Contractor before construction proceeds.

12.1.7.3 Operational Phase

Provided the Travel Plan and above mitigations are implemented correctly the target model split should be reached and reduce the potential impacts and avoid the "worst case" scenario. Details of the Travel Plan are shown in the section below.

12.1.8 Monitoring

12.1.8.1 Construction Phase

During the Construction Phase the following monitoring is advised. The specific compliance exercises to be undertaken in relation to the range of measures detailed in the final construction management plan will be agreed with the planning authority.

- Construction vehicles routes and parking
- Internal and external road conditions
- Construction activities hours of work

12.1.8.2 Operational Phase

The Travel Plan for the Proposed Development will be monitored and updated at regular intervals. This will enable tracking in terms of a reduction in the dependence on private car journeys and a shift towards sustainable transport options such as walking, cycling and the use of public transport such as buses and trains.

A management company will be appointed by the developer to manage the development. A senior member of staff from the management company who supports the philosophy of the

Plan will be appointed as the Co-ordinator. The Co-ordinator should be appointed within 2 months of the Site being occupied. A dedicated commuter space will be provided within the tenant amenity area where travel information, timetables, access to the internet and notice boards will be provided.

The Co-ordinator's roles in the development, implementation and management of the Plan will include:

- Promotion of the Travel Plan to residents;
- Implementation and maintenance of the Plan;
- Monitoring progress of the Plan;
- Liaison with public transport operators and officers of the Planning and Highway Authorities;
- Production of information reports for the Developer, the Occupier(s) and the Planning and Highway Authorities; and
- Ongoing assessment of the objectives of the Plan.

Within the first 4 months of being appointed, the Co-ordinator will arrange for a resident's travel survey to be carried out. This can be achieved by means of self-completion questionnaires, which will help to identify travel requirements and set targets and needs.

The information requested in the questionnaire should include:

- Personal details;
- Primary mode of transport;
- Current travel patterns including the time taken to travel to work and the place of work;
- Views on alternative modes to the car (i.e. what would encourage them to switch to other modes); and
- Usage of car sharing scheme;

Traditionally, response rates to such questionnaires are relatively low and it may be necessary to encourage recipients to complete and return them.

The information obtained from the survey should be entered onto a database and used to formulate and monitor the implementation of the Plan and to set and review targets. These targets are to be agreed with the Planning and Highway Authorities or their agents within 6 months of the survey being carried out.

Up to date local bus and rail timetables will be maintained within the tenant amenity area and other fixed points within the facilities on the site. Residents will be advised of their location. In addition, Internet access to travel information will be provided. The developer will provide all new residents with a travel pack showing alternative modes of travel to the development. Where possible, the developer will advise visitors to the site of alternative modes of travel to that of the car.

Secure bicycle parking facilities will be provided for residents at designated areas within the apartment blocks and on the curtilage of each house. For visitors and Crèche users, a number of bicycle parking will be provided through the site at the surface level. Local cycle route information will be provided in the tenant amenity area and at other fixed points within the development, and residents will be advised of their location.

The co-ordinator will be responsible for the management of inappropriate parking within the development.

12.1.9 Interactions

12.1.9.1 Construction Stage

Temporary negative impacts to human health may be likely during the Construction Phase due to noise, dust, air quality and visual impacts which are discussed in the relevant chapters of this EIAR. Temporary traffic management will be required to facilitate connections to existing utilities in the existing roads.

The traffic impacts, which would be temporary in duration are not considered to be significant due to the implementation of the mitigation measures identified.

12.1.9.2 Operational Stage

Noise generated by increased traffic flows have been assessed in the Air and Noise Chapters of the EIAR.

12.1.10 Difficulties Encountered When Compiling

There were no difficulties encountered in compiling this Chapter.

12.1.11 References

Dublin BusConnects Website: [New Dublin Area Bus Network - BusConnects](#)

Design Manual for Urban Roads and Streets (DMURS), Department of Transport, Tourism and Sport

Irish Rail Website: www.irishrail.ie

Dublin City Council Development Plan 2016 – 2022.

Dublin City Council Draft Development Plan 2022 - 2028

NRA Guidelines, Traffic and Transportation Assessment Guidelines (2014), National Roads Authority

Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, (May 2019), Transport Infrastructure Ireland Publications

Project Appraisal Guidelines for National Roads Unit 16.1 – Expansion Factors for Short Period Traffic Counts, (2016), Transport Infrastructure Ireland Publications

Sustainable Urban Housing: Design Standards for New Apartments, (2020), Department of Housing, Planning and Local Government

Transport for Ireland (TFI): www.transportforireland.ie

12.2 Waste and Utilities

12.2.1 Introduction

Material Assets have been defined as '*Resources that are valued and that are intrinsic to specific places, they may be either human or natural origin and the value may arise for either economic or cultural reasons*' (EPA 2002).

The definition of Material Assets was further expanded by the EPA in 2022 in '*Guidelines on the information to be contained in Environmental Impact Assessment Reports*' which states:

"In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils."

The scope and definition of Material Assets within the context of the EIA process has been defined by the EIA Directive as including Architectural and Archaeological Heritage or Cultural Heritage. These elements are assessed separately in Chapter 11 under Archaeology & Cultural Heritage.

This Chapter of the Environmental Impact Assessment Report (EIAR) provides an assessment of the potential impacts of the Proposed Development on Material Assets or physical resources in the environment of human origin including built services and infrastructure comprising:

- Electricity Supply,
- Gas Supply,
- Information and Communications Technology,
- Surface Water Drainage Infrastructure,
- Water Supply and Demand,
- Wastewater Management, and
- Waste Management

Natural resources (water, land, biodiversity, air, etc) are addressed in their respective chapters.

This Chapter was prepared by Nikita Coulter, Senior Environmental Consultant with Enviroguide Consulting. Nikita Coulter has a B.Sc. in Zoology (Hons) from University College Dublin, an M.Sc in Biodiversity and Conservation, a Postgraduate Diploma in Environmental Engineering from Trinity College Dublin, and a NEBOSH accredited International Diploma in Environmental Risk Management. Nikita has 8 years professional experience as an Environmental Compliance Specialist.

12.2.2 Study Methodology

The methodology adopted for the assessment takes cognisance of the relevant guidelines the following:

- Environmental Protection Agency (EPA) (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)
- EPA (2003) Advice Notes on Current Practice in the preparation of Environmental Impact Statements.
- EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements.

The scope of work undertaken for the assessment included a desk-based study of material assets, namely built services, utilities and infrastructure associated with the existing Site and the Proposed Development. All phases of the Proposed Development were considered in the assessment of potential impacts on material assets.

Information on built assets in the vicinity of the Site of the Proposed Development was assembled by the following means:

- A desktop review of ESB Networks Utility Maps, Irish Water Utility Plans, Gas Networks Ireland Service plans, EIR E-Maps, M&E Utilities Report, Preliminary Construction, Demolition & Waste Management Plan, Energy Analysis Report and the Engineering Assessment Report.

Assessment of the likely impact of features of the Proposed Development, including surface water runoff, foul water discharge and water usage was carried out in accordance with the following guidelines:

- IS EN752, "Drain and Sewer Systems Outside Buildings"

The study area, for the purposes of assessing the baseline conditions for the Material Assets Chapter of the EIAR, extends beyond the site boundaries and includes potential receptors within a 2.0km radius of the Proposed Development site. The extent of the wider study area was based on the Institute of Geologists of Ireland (IGI) Guidelines (IGI, 2013) which recommend a minimum distance of 2.0km radius from the Proposed Development site.

12.2.2.1 Prediction and Assessment of Impacts

Impacts were predicted and assessed based on EPA Guidance (2022) and by using the definitions detailed in Tables 12-25 to 12-29. Impact will vary from negative to neutral or positive, and also will vary in significance on the receiving environment. Where significant potential impacts were identified, mitigation measures are proposed to minimise impacts.

Table 12-25: Terminology used to assess the quality potential impacts & effects

Quality of Effects / Impacts	Definition
Negative	A change which reduces the quality of the environment.
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment.

Source: EPA, 2022

Table 12-26: Terminology used to assess the significance of potential impacts & effects

Significance of Effects / Impacts	Definition
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	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

Source: EPA, 2022

Table 12-27: Terminology used to assess the duration of potential impacts/effects

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

Source: EPA, 2022

Table 12-28: Definition of the Extent and Context of Effects

Quality	Definition
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?)

Source: EPA, 2022

Table 12-29: Definition of the Probability of Effects

Quality	Definition
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.

Source: EPA, 2022

Figure 12-19 (extracted from the *EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022*) shows how the character of the predicted impact in relation to the sensitivity of the receiving environment can determine the significance of the impact.

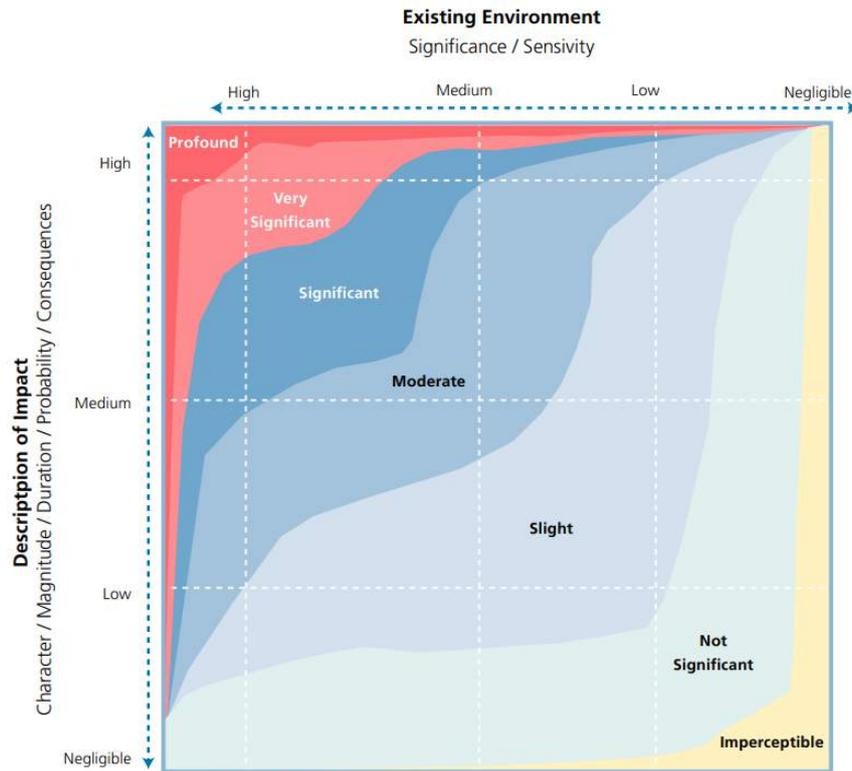


Figure 12-19 Chart showing typical classifications of the significance of impacts (EPA, 2022, Guidelines on the Information to be Contained in Environmental Impact Assessment Reports)

12.2.3 The Existing and Receiving Environment (Baseline Situation)

12.2.3.1 Site Location

The Site of the Proposed Development is situated in the northern suburbs of Dublin City, approximately 5km from Dublin City centre, in an established residential area on lands east of St Paul's College, Sybil Hill Road, Raheny, Dublin 5. The Site is bound to the North, East and South by St Anne's Park and to the West by residential development at The Meadows, Sybil Hill House (a Protected Structure) and St Paul's College. Vehicular access to the site is from Sybil Hill Road.

12.2.3.2 Land Use History

Historical mapping and aerial photography available from the Ordnance Survey of Ireland website (OSI, 2021) were reviewed and key observations on-site and off-site are summarised in Table 12-30.

Table 12-30: Historical Land Use

Date	Information Source	Site Description
1837-1842	OSI map 6inch	On-site: Maryville House is located in the north-western corner of the site. The rest of the Site is comprised of the associated buildings, garden and demesne lands of Maryville House. Off-site: The Site is surrounded by gentry settlements including Sybil Hill House (west), St Annes House, Furry Park (west), Rosevale (northeast) and Glebe House (north) and agricultural lands.
1888-1913	OSI map 25inch	On-site: No significant changes Off-site: No significant changes
1830-1930	OSI Cassini map 6inch	On-site: Additional buildings are seen within the grounds of Maryville House. Off-site: A new 2.4km long entrance avenue has been constructed from St Anne's House to the eastern extent of Sybil Hill townland.
1995	OSI Aerial photography	On-site: Maryville House has been demolished and the grounds have been converted to playing fields. Off-site: St. Paul's College and The Meadows residential development have been constructed directly East of the Site. Sybil Hill House is still visible. St. Anne's House has been demolished and the lands to the north and south of the Site are now St. Anne's GAA Pitches. The Millennium Arboretum has been planted to the east of the Site. Further offsite, dramatic changes to the surrounding landscape, with the majority of lands converted to residential development.
2000	OSI Aerial photography	On-site: No significant changes Off-site: No significant changes
2005	OSI Aerial photography	On-site: No significant changes Off-site: No significant changes
2005-2013	OSI Aerial Photography	On-site: No significant changes Off-site: A building directly west of The Meadows has been demolished.
2021	Google Maps Photography	On-site: No significant changes Off-site: A childcare and social services center have been constructed on the site of the demolished building to the west of The Meadows. The trees in the Millennium Arboretum are now well developed.

12.2.3.3 Immediate Surroundings

The Site is bound to the North, East and South by St Anne's Park;; and to the west by a residential development at The Meadows, Sybil Hill House (a Protected Structure) and St Paul's College.

12.2.3.4 Local Settlement and Land Use

St Anne's Park is an extensive, historic parkland and a major amenity and public open space. The c. 110 ha Park is a well-used, popular amenity and recreational resource extending from its entrance off Sybil Hill Road in the west to the coast at Dollymount in the East.

St Paul's College was established in 1950 and forms part of a belt of religious lands located on both sides of Sybil Hill Road. The planned capacity of the school is 600 no. pupils with the ability to accommodate up to 650 no. pupils without significant additional accommodation.

The site of the Proposed Development, together with the lands of Sybil Hill House and of St. Paul's College, are Zoned Z15 under the Dublin City Development Plan 2016-2022 (DCDP) and the Draft Dublin City Development Plan 2022-2028. Land-Use Zoning Objective Z15 is: "To protect and provide for institutional and community uses". A small section of the site to the northeast, is zoned Z9 as this includes lands within St. Anne's Park required to provide for the routing of a surface water discharge from the site via St. Anne's Park to the Naniken River.

As the site of the Proposed Development is Zoned Z15, which zoning includes residential development as 'Open for Consideration Uses' within the associated land use matrix, the logic for residential development is that it: (i) can benefit from established urban infrastructure and services; (ii) can tie into an established residential community and (iii) can contribute to population rejuvenation and support for economic provision of urban services.

"With any development proposal on these lands, consideration should be given to their potential to contribute to the development of a strategic green network... and to the delivery of housing in the city. In addition, development at the perimeter of the site adjacent to existing residential development shall have regard to the prevailing height of existing residential development..."

12.2.3.5 Electricity Supply

12.2.3.5.1 Local Supply & Grid Connection

EirGrid develop and operate the national electricity grid and are responsible for taking electricity from the power generators and delivering it to the distribution network, which is operated by ESB Networks. The high-voltage Irish electricity transmission grid comprises 6,800 km of power lines and operates at 400 kV, 220 kV and 110 kV. Substations provide entry points to, and exits from, the transmission grid.

The site is well located with regard to ESB Networks infrastructure. The M&E Utilities Report (included as Appendix P) states that there doesn't appear to be any transmission cables traversing the site of the Proposed Development. There are 38kV and 20kV/10kV LV/MV underground cables on Sybil Hill Road. The ESB Networks drawing represented in Figure 12-20 indicates the network distribution capacity to the Proposed Development.

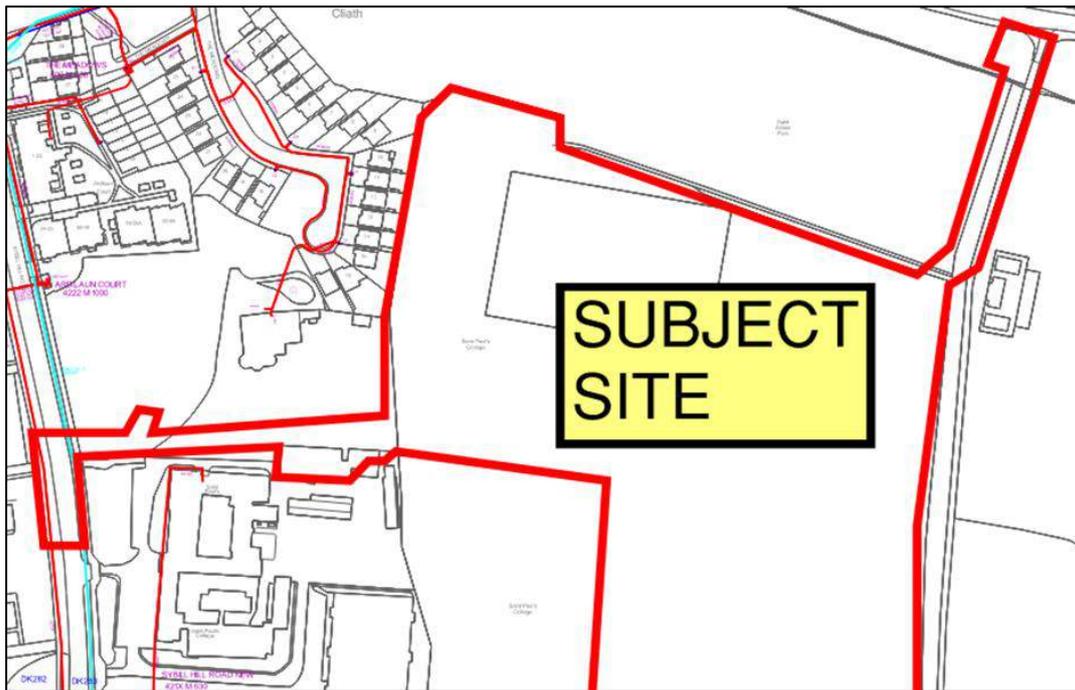


Figure 12-20 ESB Networks distribution capacity drawing for the Proposed Development
(Source: M&E Utilities Report, IN2 Engineering Design Partnership, August 2022)

12.2.3.5.2 Onsite Supply and Consumption

The Site is currently greenfield and was previously used as playing pitches. There is currently no onsite consumption of electricity.

12.2.3.6 Gas Supply

Gas Networks Ireland builds, develops and operates Ireland's gas infrastructure, maintaining over 14,521 km of gas pipelines and two sub-sea interconnectors. Gas Networks Ireland is responsible for connecting all new gas customers to the network, and for work on service pipes and meters at customers' premises, on behalf of all gas suppliers in Ireland.

The Gas Networks Ireland map (refer to Figure 12-21) for the surrounding area indicates buried natural gas pipework local to development to Sybil Road and neighbouring site. There appears to be no existing natural gas connection to the proposed site.

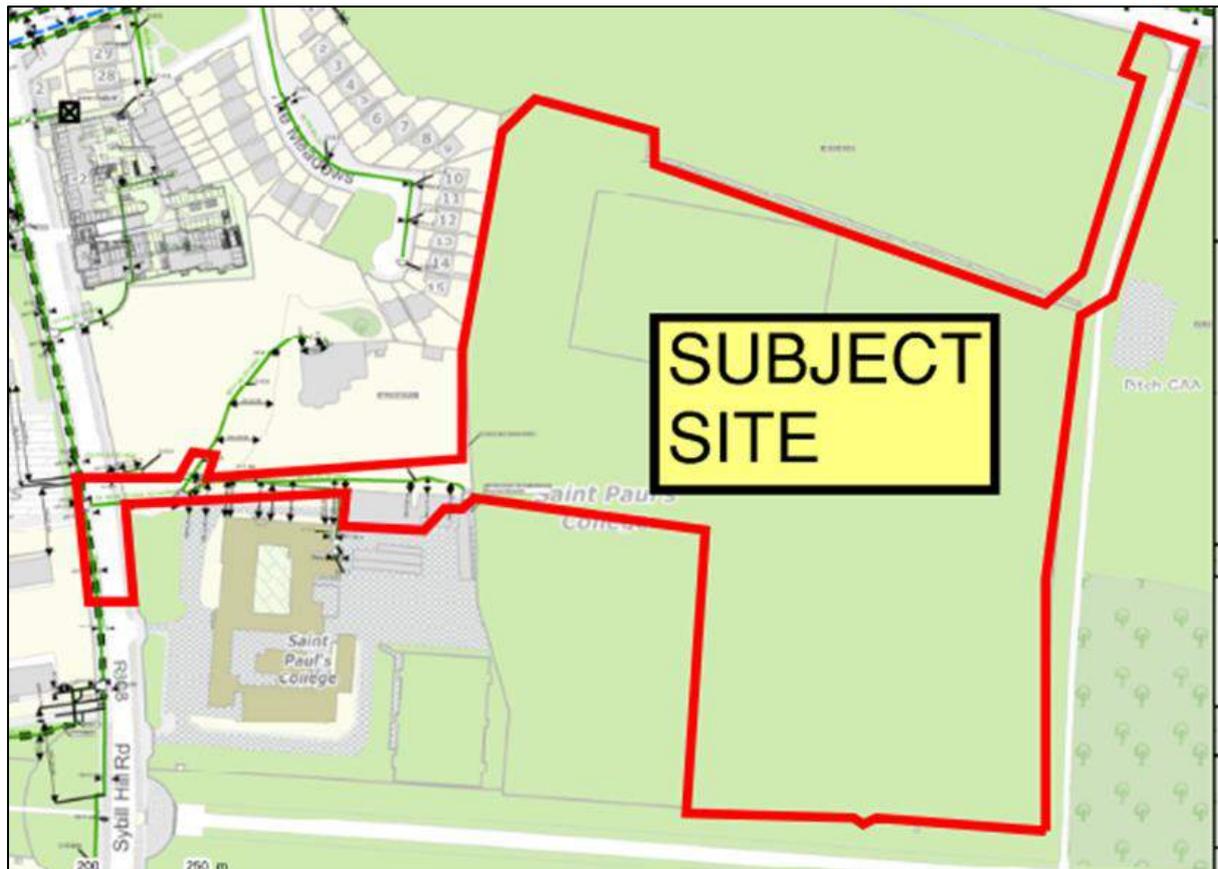


Figure 12-21 Gas Networks Ireland map for the Proposed Development (Source: M&E Utilities Report, IN2 Engineering Design Partnership, August 2022).energy analysis

12.2.3.7 Information and Communications Technology (ICT)

National Broadband Ireland was set up by the Irish Government to facilitate the roll out of fibre broadband across the Country. The Department of the Environment, Climate and Communications have developed an interactive map which details the progress of the rollout of the National Broadband Plan. The High-Speed Broadband map identifies locations and premises as amber or blue and the map is updated on a quarterly basis. Amber areas depict target areas for the State intervention of the National Broadband Plan. Blue areas indicated that commercial operators have instated or are in the process of delivering high speed broadband services. St. Pauls College, St. Annes Park, Sybil Hill Road, and the vast majority of Dublin City are located within a Blue area and High speed broadband is available.

In terms of mobile telecommunication for transmission and reception, the closest mobile/ICT communications mast (Vodafone, Three and Meteor) is located in Saint Anne's Park near the Health Centre on Vernon Avenue, Clontarf, Dublin 3, approximately 400m southwest of the Site of the Proposed Development.

The Site is currently greenfield, hence IT infrastructure for operations and administration is not established or in place.

12.2.3.8 Water Supply and Demand

The Site is greenfield and as such there is no water supply or demand at present. The Site is currently not connected to a municipal water supply, but it is located in a well-serviced urban area. There is an existing 250mm uPVC watermain in Sybil Hill Road, which continues south of the proposed Site entrance, connecting to an existing spun iron watermain. North of the Site, there is an existing 300mm cast iron trunk watermain, which serves the local area including feeding the Sybil Hill Road main (*Engineering Assessment Report, Waterman Moylan, 2022*).

12.2.3.9 Local Hydrology and Hydrogeology

The Site of the Proposed Development is located within the Liffey and Dublin Bay catchment and the Mayne_SC_010 sub-catchment. The closest mapped watercourse to the Site is the Naniken River, which is located approximately 100m north of the Site. The Naniken River is visible through St. Anne's Park for its entire lower course and is culverted upstream of St. Annes Park for its upper course. The river discharges to the sea via a culvert beneath the James Larkin Road (R807) approximately 1.7km east of the Site between North Bull Island and the mainland.

The Site is situated on the Dublin groundwater body, which is Not at Risk of not meeting its Water Framework Directive objectives. The aquifer within the Site boundary is a Locally Important Aquifer (LI) on bedrock which is Moderately Productive only in Local Zones. The groundwater rock units underlying the aquifer are classified as Dinantian Upper Impure Limestones (GSI, 2021). The level of vulnerability of the Site to groundwater contamination via human activities is Low. The soil within the east area of the Site is classified as Urban, with the remaining soil designated as Fine loamy drift with siliceous stones and the subsoil is comprised of Limestone till (Carboniferous) and Man-Made (EPA, 2021).

12.2.3.10 On-site Surface Water Drainage

The Site is a greenfield site composed of grass-based playing fields pitches and natural parkland coverage. As such, surface water currently infiltrates to ground and run-off discharges to the surrounding watercourses in line with the existing topography of the Site. Topographic survey data indicates that the site falls generally from west to east, with a high point of approximately 25.5m OD Malin at the west of the site and a low point of approximately 21.4m OD Malin at the south-eastern corner of the site and 21.7m OD Malin at the north-eastern corner of the site. The site lies within the catchment of the Naniken River, which ultimately discharges to Dublin Bay (*Engineering Assessment Report, Waterman Moylan, 2022*).

12.2.3.11 Wastewater Management

The Site is greenfield and as such there are no wastewater management requirements at present. There is no foul water sewer in Sybil Hill Road at the site entrance. As the Site is located in an urban area, there are foul sewer lines in the surrounding area. An existing 1,350mm diameter foul sewer, which is part of the North Dublin Drainage Scheme, discharges in an easterly direction immediately south of the Site, before traversing the south-eastern corner of the site. Also, there are existing sewers in The Meadows at the north-west of the site, connecting to an existing 225mm sewer in Howth Road (*Engineering Assessment Report, Waterman Moylan, 2022*).

12.2.3.12 Waste Management

Dublin City Council (DCC) is the local authority responsible for setting and administering waste management activities in the area of the Proposed Development. DCC's waste management activities are governed by the requirements set out in the Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021. The subject site is currently a greenfield site and therefore has no waste management requirements.

12.2.4 Characteristics of the Proposed Development

The Proposed Development consists of the construction of a residential and nursing home development set out in 7 no. blocks, ranging in height from 4-7 storeys to accommodate 580 no. apartments, residential tenant amenity spaces, a crèche and a 100 bed nursing home. The site will accommodate car parking spaces, bicycle parking spaces, storage, services and plant areas at both basement and podium level.

Landscaping will include extensive communal amenity areas, and a significant public open space provision on the east and south of the site. The proposed application includes all site landscaping works, green roofs, substations, boundary treatments, lighting, servicing, signage, surface water attenuation facilities and associated and ancillary works, including site development works and services above and below ground. For a full description of the Proposed Development please refer to the Statutory Notices.

12.2.4.1 Construction Phase

The Proposed Development is to be constructed in two stages which will include, in broad terms, the following:

- Stage I: Site demolition works, site clearance and preparation work for the construction. A site compound including offices and welfare facilities will be set up by the Main Contractor.
- Stage II: Site development and construction. The development includes all associated site works and infrastructure which includes roads, utilities, foul and surface water drainage.

The Construction Phase is intended to be an 18 month programme. The operational hours for the site will be 08:00 to 17:00 Mondays to Fridays and 08:00 to 14:00 Saturdays. No work is permitted on Sundays or public holidays. Deviation from these hours will only be allowed in exceptional circumstance with prior written approval from the planning authority.

12.2.4.2 Operational Phase

The Operational Phase of the Proposed Development will consist of the normal day-to-day operations necessary for the management of a creche and nursing home, and the ongoing maintenance of residential units and amenity space.

The traffic assessment presented in Chapter 12.1 of this EIAR concludes that whilst the surrounding road network can cater for the Proposed Development, the increase in traffic over the baseline condition will result in a moderate impact on the surrounding roads network.

12.2.5 Potential Impact of the Proposed Development

This section assesses the impact of the Proposed Development on the Material Assets of the area.

12.2.5.1 Local Settlement

Specific issues relating to Population and Human Health associated with the Proposed Development are set out in Chapter 4 of this EIAR. The Operational Phase of the Proposed Development will result in an increase in the population of the area, and it will have a positive impact on the long-term supply needs of housing in the greater Dublin area. The Proposed Development has the potential to increase the level of direct and indirect employment associated with the operation of the creche, the nursing home and property management services.

12.2.5.2 Electricity Supply

12.2.5.2.1 Construction Phase

There will be temporary power requirements during the Construction Phase for lighting and construction activities. The power demand during the Construction Phase will be catered for by way of on-site power generators.

Connecting a new multi-unit housing development to the electricity distribution system must be carried out in accordance with ESB Networks' specifications, and in particular with the guidance provided in the documents ESB Networks National Code of Practice for the Customer Interface Version 5 (2021) and ESB Networks Construction Standards for MV Substation Buildings (2019). The developer must undertake the preparatory work such as installation of ducting and provision of substation plinth or building. Once the preparation work has been completed to a satisfactory standard, ESB Networks will commence installation of the electricity cabling/lines and any other necessary equipment. A temporary suspension of the network locally to facilitate the connection works may be required during the Construction Phase, and an additional temporary suspension will also occur when power is provided to the Site of the Proposed Development. These temporary suspensions will be controlled by ESB Networks as the statutory undertaker and in accordance with standard protocols.

The potential impact from the Construction Phase of the Proposed Development on the local electrical supply network is likely to be negative, slight, and short-term.

12.2.5.2.2 Operational Phase

Contact has been made with the utility provider, ESB Networks, to discuss the power supply to support the Proposed Development. ESB Networks has indicated that there are currently no issues with the provision of the required power to the Proposed Development (*M&E Utilities Report, IN2 Engineering Design Partnership, August 2022*).

Electricity will be required to provide public lighting, domestic lighting, power supply and heating for each individual unit for the Proposed Development. Electric car charging facilities will be provided in the car park in line with Government policy. An Energy analysis has been undertaken by IN2 Engineering Design Partnership (August 2022) in order to demonstrate the Proposed Development's compliance to Building Regulations Technical Guidance Document (TGD) Part L 2019. The analysis determined that through the following energy and servicing strategies that an A2/A3 BER should be obtainable:

- Improvements to building thermal transmittance (U-Values), air permeability and thermal bridging with respect to Part L defaults.
- De-Centralised Heating and Hot Water Plant arrangement to each apartment.
- Exhaust Air Heat Pumps (EAHP's) plant delivering all the annual heating and hot water requirement.
- Exhaust Air Heat Pump extracting stale air from apartment creating negative pressure. Passive make-up air from façade providing fresh air to all liveable spaces.
- Photovoltaic (PV) array for electricity generation, centralised to connect to Landlord systems. Minimum required 6/8 no. panels total (330 W peak/ 1.68m² each) per landlord core allocated at roof level.

Further information is available within the Energy Analysis Report (IN2 Engineering Design Partnership, August 2022), and the Building Lifecycle Report (Aramark, August 2022) that will be submitted as part of this application.

The impact of the Operational Phase of the Proposed Development on the electricity supply network is likely to be to increase demand to the existing supply, however, taking into account the energy strategies that are proposed in the Energy Analysis Report, the potential effect from the Operational Phase on the electricity supply network in the study area is likely to be neutral and not significant in the long term.

12.2.5.3 Gas Supply

12.2.5.3.1 Construction Phase

Connecting a new multi-unit housing development to the gas network system must be carried out in accordance with Gas Networks Ireland's specifications. The developer must employ the services of a registered mechanical installer or plumber and select and register with a natural gas supplier. A temporary suspension of the network locally to facilitate the connection works may be required during the Construction Phase. These temporary suspensions will be controlled by Gas Networks Ireland as the statutory undertaker and in accordance with standard protocols. The potential impact from the Construction Phase of the Proposed Development on the local gas supply network is likely to be negative, slight, and short-term.

12.2.5.3.2 Operational Phase

The utility strategy for the residential development will avail of a centralised plant room consisting of modular gas fired condensing boilers, gas fired condensing combined heat and power plant and air source heat pump plant. A gas connection has been allowed for at this stage of the project (*M&E Utilities Report, IN2 Engineering Design Partnership, November 2022*).

There will be an increase in the gas demand from existing resources. The natural gas supply to support the new development has been discussed with utility provider, Gas Networks Ireland (GNI). GNI have confirmed that there is adequate pressure in the gas network and have raised no concerns about providing natural gas to the Proposed Development. The increase in demand is not significant.

12.2.5.4 Information and Communications Technology (ICT)

12.2.5.4.1 Construction Phase

Connections will be required to the existing ICT network during the Construction Phase of the Proposed Development which, if not conducted in accordance with best practice, has the potential to impact on local telecoms & ICT connectivity. However, due to the temporary and phased nature of the Construction Phase the potential impact of the Construction Phase on the local telecoms network is considered negative and not-significant.

12.2.5.4.2 Operational Phase

The impact of the Operational Phase of the Proposed Development on the telecoms network is likely to be a marginal increase in demand. The Site of the Proposed Development is located within an area where high speed broadband is available, and as such, the impact from the Operational Phase on the telecoms network is likely to be neutral and not significant in the long term.

12.2.5.5 Water Supply and Demand

It is noted that specific issues relating to Hydrology associated with the Proposed Development are set out in Chapter 7 of this EIAR.

12.2.5.5.1 Construction Phase

Site offices and construction activities will create a demand for water supply to the site. Commencement of construction will therefore result in a net increase in the water demand for the site.

Irish Water (IW) issued a Confirmation of Feasibility (COF) (Ref. CDS21008008) dated 9th December 2021, confirming that water supply connections for the site are 'feasible without infrastructure upgrade by Irish Water'. It is proposed to provide a new 180mm diameter connection to the existing 250mm diameter water supply main in Sybil Hill Road. A new looped network will be constructed through the site and a bulk meter with associated telemetry system will be connected to the new watermain along the entrance road, in accordance with Irish Water requirements. All watermains will be laid strictly in accordance with Irish Water requirements, and valves, hydrants, scour and sluice valves and bulk water meters will be provided in accordance with the requirements of Irish Water.

Some local diversions may be required to water supplies to accommodate the construction works which may require temporary outages. Additionally, new connection works may cause water supply disruptions during the Construction Phase. These disruptions will be controlled by Irish Water and DCC in accordance with standard protocols. Due to the nature of the works during the Construction Phase, the likely effect will be negative, not significant and temporary.

12.2.5.5.2 Operational Phase

During the Operational Phase of the Proposed Development there will be a demand for water from the public water supply. The calculated water demand is set out in detail in Chapter 7 of this EIAR. The domestic demand has been based on an average occupancy ratio of 2.7 persons per dwelling with a daily domestic per capita consumption of 150 litres with a 10% allowance factor. The average day/peak week demand has been taken as 1.25 times the average daily domestic demand, while the peak demand has been taken as 5 times the

average day/peak week demand (Irish Water Code of Practice for Water Infrastructure, 2020). The average demand for the Proposed Development is 3.56 litres/second (l/s), with a peak demand of 22.22l/s. In accordance with best practice, water conservation appliances are to be incorporated as part of the Proposed Development to reduce the water demand.

Excess usage is the consumption of water services above the threshold amount stipulated in the Water Services Act (2017). Water use above the annual household allowance (213m³) is considered to be excessive use and Irish Water customers may be liable for charges on the amount above this level.

The likely effect of the increase in mains water demand will be neutral, not significant, and long-term on mains water supply.

12.2.5.6 Water Environment – Hydrology and Surface Water Drainage

It is noted that specific issues relating to Hydrology associated with the Proposed Development are set out in Chapter 7 of this EIAR.

12.2.5.6.1 Construction Phase

Surface water currently discharges to the Naniken River to the North of the Site. There is a possibility of temporary contamination to the surface water network during construction activities. Sedimentation and silt arising from construction activities could contaminate the surface water network. Refuelling of vehicles may result in spillages, which could impact local surface water bodies. In the event of spillages, steps will be taken to prevent environmental pollution, for example through protection of drains by use of drain covers or booms, use absorbent granules following an oil / chemical spill. Water quality mitigation measures are set out fully in the Construction Environmental Management Plan (CEMP) (*Enviroguide Consulting, 2022*), which is submitted as a separate document with this planning application.

12.2.5.6.2 Operational Phase

Surface water runoff from the catchment will be restricted via a Hydro-brake or similar approved flow control device, limited to the calculated greenfield equivalent runoff rate of 17l/s, before discharging to the public network. The proposed flow control device is to be limited to the greenfield equivalent runoff rate. The net runoff volume from the site will therefore remain unchanged.

The runoff from the roads and hardstanding areas will discharge contaminants, including oils and silts, to the surface water system which could result in pollution to the surface water network. At-source treatment SuDS techniques will be employed to address this issue, including roadside tree pits and the installation of a petrol interceptor to remove hydrocarbons before the surface water outfall to the Naniken River. The surface water drainage incorporating the SuDS proposals for the Proposed Development will result in an overall 'neutral', 'imperceptible' 'long-term' impact on receiving surface water quality and groundwater quality and associated receptors compared to the baseline conditions.

12.2.5.7 Wastewater Management

It is noted that specific issues relating to Hydrology associated with the Proposed Development are set out in Chapter 7 of this EIAR.

12.2.5.7.1 Construction Phase

Irish Water (IW) issued a Confirmation of Feasibility (COF) (Ref. CDS21008008) dated 9th December 2021, confirming that connections from the site to the 1,350mm sewer at the south of the development is feasible without any infrastructure upgrade by IW.

Foul water sewer connections will be constructed strictly in accordance with IW requirements and drains will be laid to comply with the requirements of the latest Building Regulations, and in accordance with the recommendations contained in the Technical Guidance Document H. During the construction of the new foul sewers specific measures will be taken to prevent the release of effluent to the Naniken River and Dublin Bay during the Construction Phase. These measures include, but are not limited to, the use of silt traps, silt fences, silt curtains, settlement ponds and filter materials. Further information on these measures and their implementation is provided in the CEMP. The adherence and full implementation of the appropriate mitigation measures will ensure there is no potential for pollution of watercourses to arise.

The new connection works may cause disruptions to the foul water network during the Construction Phase. These disruptions will be controlled by IW and DCC in accordance with standard protocols. Due to the nature of the works during the Construction Phase, the likely effect will be negative, non-significant and temporary.

12.2.5.7.2 Operational Phase

It is proposed to drain wastewater from the site by gravity to the existing 1,350mm wastewater sewer at the south-eastern corner of the Site. There will be a net peak foul water flow of 10.207l/s discharging to the existing sewer. The Proposed Development will result in a net increase in flows to the network.

Foul water from the Proposed Development is ultimately discharged to Ringsend Wastewater Treatment Plant (WwTP). An in-depth study of the foul water treatment infrastructure in the Greater Dublin Area was ordered by the Dublin Region Local Authorities in 2005, which identified the Ringsend WwTP as overloaded and not in compliance with the EU's Urban Wastewater Treatment Directive.

A major upgrade is now underway at the Ringsend WwTP to increase the treatment capacity of the facility from 1.6 million Population Equivalent (PE) to 2.4 million PE. The upgrade works will allow (on a phased basis) the facility to treat the increasing volumes of wastewater while achieving the standards of the Urban Wastewater Treatment Directive, enabling future housing and commercial development in the Greater Dublin Area. Additionally, a proposed WwTP at Clonshaugh will, in the future, reduce the dependency on the Ringsend WwTP.

The increase in foul water at the Ringsend WwTP as a result of the Proposed Development is considered to be insignificant in terms of the overall scale of the facility. Therefore, the impact on the foul water network as a result of the Operational Phase of the Proposed Development is considered to be neutral, not significant and long term.

12.2.5.8 Waste Management

12.2.5.8.1 Construction Phase

The majority of waste arising during the Construction Phase will comprise soil and stone materials associated with the excavation works required for the basement, foundations and connections to utilities and services.

While efforts have been made to follow the existing topography of the site, in order to minimise the cut and fill requirements, the Proposed Development includes two large basements which will significantly increase the cut volume. The volume of soil to be excavated and removed from the site is 86,000m³, without any bulking factor applied. Applying a 25% bulking factor, the volume of soil to be removed by appropriately authorised waste collection contractors will be approximately 107,500m³.

There will be some demolition waste associated with the demolition of an existing prefabricated building. If concrete needs to be crushed on site, a waste permit will be required. Minimal quantities of crushed concrete are anticipated, and arisings will be used as crushed and used as site haul roads as per detailed in the CDWMP. A member of the construction team will be appointed as the Waste Manager to ensure commitment, operational efficiency and accountability during the Construction Phase of the Proposed Development.

The waste streams that will be generated by Construction and Demolition (C&D) activities are as follows:

- Demolition waste from the existing prefabricated buildings
- Topsoil and subsoil
- Packaging and general waste from construction activities
- General site clearance waste including tree stumps

These wastes are as defined in the Construction and Demolition Waste Management Plan (CDWMP) (*Waterman Moylan, 2022*). As set out in the CDWMP, which is submitted as a separate document with this planning application, all waste generated during the Construction Phase will be segregated onsite to enable ease in re-use and recycling, wherever appropriate.

In general, the priority of the CDWMP will be to promote recycling, reuse and recovery of waste and diversion from landfill wherever possible. After in-situ reuse and recycling options have been fully considered, all residual waste streams will be collected by appropriately authorised waste collection contractors and will be managed using suitably permitted/licensed waste disposal or materials recovery facilities. Due to the use of permitted/licensed waste collection/waste management facilities, it is anticipated that the likely effects arising from the production of waste will be neutral, short term and not significant on the environment of the study area. It is the responsibility of the Main Contractor to ensure that waste collection contractors are legally permitted to carry the waste, and that the facility they bring the waste to is licensed to handle that type of waste as outlined in the Waste Management Acts 1996 (as amended).

It is noted that there will be small amounts of domestic waste generated by workers present on the site during the Construction Phase. This will be managed in accordance with the DCC byelaws on waste and in accordance with the principles set out in the CEMP. All wastes generated from the work force on site will be managed and disposed of in accordance with the principles of segregation and will be removed from site by a provider with appropriate licencing.

12.2.5.8.1.1 Asbestos Containing Material

Occupational Hygiene & Safety Services (OHSS) carried out an asbestos survey to HSG264 requirements in 2019 for the purposes of identifying Asbestos Containing Materials (ACM) in the premises(s) prior to planned demolition. OHSS produced a report which is included in full as Appendix C of the CDWMP. The findings of the ACM survey are as follows:

- Asbestos containing cellulose board was found in the walls and ceiling of the older prefabs. This asbestos board is on both side of the partition walls and on the ceilings. In many places the board is covered over with particle board and hard board.
- Asbestos containing slates were found under the floor joists of the older prefabs where they were used to level the timbers during construction.
- Asbestos containing green floor tiles were found in Room X6 of the prefab.
- As the prefab was still in use at the time of the survey it was not possible to core through the roof. Once the prefab is decanted a core should be drilled to assess the makeup of the roof. Asbestos may be present in lower layers of felt or on strawboard.

Prior to demolition of the building or structure ACM must be removed and disposed of by a competent contractor. ACM removal will form part of a construction project and will require careful coordination to be carried out safely. Following removal of the ACM a site clearance for reoccupation certificate must be obtained from a competent independent analyst prior to demolition of the structure in accordance with Regulation 15 (10) of the Safety Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010. Full details are included in the CDWMP.

12.2.5.8.1.2 Invasive Plant Species

An invasive plant species survey will be required prior to construction, and if any are identified on site, they will be removed by a competent and experienced contractor and will be disposed of as a waste material using appropriately permitted/licensed waste collection/waste management facilities.

12.2.5.8.2 Operational Phase

An Operational Waste Management Plan (OWMP) has been prepared for the Proposed Development by AWN Consulting (2022). The OWMP contains full details of the types and quantities of waste that may arise at the Proposed Development.

The typical wastes that will be generated during the Operational Phase of the Proposed Development will include the following:

- Dry Mixed Recyclables (DMR) – includes wastepaper, cardboard and plastic packaging, metal cans, plastic bottles, aluminium cans, tins and Tetra Pak cartons. These materials could potentially catch fire, and this would be a significant local effect with a short-term, negative impact.
- Organic waste – food waste and green waste generated from internal plants / flowers. These materials could attract vermin if they are not appropriately stored, and the stores maintained.
- Glass – no significant environmental concerns have been identified for the storage of domestic glass waste at the Proposed Development.
- Mixed Non-Recyclable (MNR) / General Waste – these materials could attract vermin if they are not appropriately stored, and the stores maintained.

There will be some additional waste types generated in small quantities which will need to be managed separately including:

- Green / garden waste may be generated from internal plants or external landscaping
- Batteries (both hazardous and non-hazardous)

- Waste electrical and electronic equipment (WEEE) (both hazardous and non-hazardous)
- Printer cartridges / toners
- Chemicals (paints, adhesives, resins, detergents, etc.)
- Light bulbs (Fluorescent Tubes, Long Life, LED and Filament bulbs)
- Textiles (rags)
- Waste cooking oil (if any generated by the residents or creche tenants)
- Furniture (and from time-to-time other bulky wastes)
- Abandoned bicycles

In addition to the typical waste materials that will be generated at the Proposed Development daily, healthcare waste will also be generated at the Nursing Home. Healthcare waste is defined as “solid or liquid waste arising from healthcare”. Waste materials generated will fall into two main categories, namely healthcare non-risk waste (i.e. non-clinical healthcare waste) and healthcare risk waste (hazardous). Healthcare risk waste will be generated from the treatment of residents and from contaminated items associated with treatment. The Nursing Home will provide care services only and will not carry out significant surgical procedures or cancer care services. Hence, the healthcare risk waste generated at the Nursing Home will comprise waste disposed of in yellow bags (such as dressings, swabs, bandages, gloves, nappies etc.) and yellow sharps buckets (for waste such as needles, syringes, razors, stitch cutters etc.). Full details regarding the segregation, storage and management of healthcare waste are provided in the OWMP (AWN Consulting, 2022).

12.2.5.9 Potential Cumulative Impacts

Cumulative Impacts can be defined as “impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

A review of other off-site developments and Proposed Developments was completed as part of this assessment. There are several existing planning permissions on record in the area ranging from small-scale extensions and alterations to existing residential properties to some larger-scale developments. The larger-scale developments identified within the vicinity of the Proposed Development are detailed in Table 12-31:

Table 12-31 Relatively large-scale developments permitted in the vicinity of the Proposed Development

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment
2857/18 Decision: Grant Permission. Decision Date: 19/12/2018	MKN Developments Limited	Amendments to the permitted development (Reg. Ref. 4242/15; ABP Ref. PL29N.246250 and as amended by Reg. Ref. 2977/17, ABP Ref. PL29N.249043) at this 0.53 hectares site at Sybil Hill Road, Raheny Dublin 5. The site is bounded by St. Pauls School to the south, Sybil Hill Road to the west, The Meadows residential development to the east and north and the Kare Social Services Centre to the north. The site	The Planning Authority (DCC) granted permission for the development subject to 11 no. condition(s). The conditions relate to working hours, noise control, public road

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment
		<p>formerly incorporated No. 1, 1A and 1B Sybil Hill Road (and lands to the rear of same). The proposed amendments consist of:</p> <ul style="list-style-type: none"> - The provision of an additional penthouse unit to Block A at 5th floor level and the extension of the 4th floor level to provide for 2 no. additional units (1 no. 3 bed unit and 1 no. 4 bed unit) to Block A increasing the unit number from 49 no. to 51 no. in Block A and from 76 no. to 78 no. overall (71 no. apartments and 7 no. houses); - The proposed additional units will result in a part increase in height of Block A at the south western corner fronting Sybil Hill Road from 16.1m to 19.25m; - The proposed extension to the 4th floor level to provide for 1 no. 3 bed units will be set back c. 5.6m from the western boundary along Sybil Hill Road with the penthouse unit at the new 5th floor level being set back c.2.5m from the western boundary with Sybil Hill Road. - Amendments to communal open space at 4th floor level to accommodate the additional residential units; - Minor elevational changes to Block A including the provision of private roof terraces at 4th and 5th floor level; - SUDs drainage and all ancillary and associated site development and landscaping works. 	<p>cleaning, traffic management and waste management. Specific conditions have been set by the Drainage Division regarding surface and foul water sewers and SuDS measures, which must be strictly adhered to. Therefore, there are no cumulative impacts anticipated with this development.</p>
<p>3167/19 Decision: Grant Permission. Decision Date: 09/09/2019</p>	<p>Sean Carroll Garages Ltd.</p>	<p>Planning permission for development approved under Dublin City Council Reg. Ref. 4353/16 at the existing petrol filling station consisting of revisions to existing shop and forecourt including: (i) Change of use and internal alterations to ground floor to provide additional retail floorspace of 8 sq.m and ancillary facility for sales of hot food for consumption off the premises, (ii) New ground floor window and pay hatch to front elevation, (iii) Revisions to car parking layout, and (iv) all associated site, drainage and boundary development works.</p>	<p>The Planning Authority (DCC) granted permission for the development subject to 8 no. condition(s). The conditions relate to the sale of hot food, visual amenity, noise control, and traffic safety. Therefore, there are no cumulative impacts anticipated with this development.</p>
<p>3047/21 Decision: Grant Permission. Decision Date: 01 Oct 2021</p>	<p>The Board of Management of Greenlanes National School</p>	<p>Planning permission for the construction of a single storey extension to the rear of the existing school at the north western side of the site and including all associated site works.</p>	<p>The Planning Authority (DCC) granted permission for the development subject to 8 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, transport and parking. Conditions have been set by the Drainage Division regarding surface and foul water sewers and SuDS measures, which must be strictly adhered to. Therefore,</p>

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment
			there are no cumulative impacts anticipated with this development.
2998/20 Decision: Grant Permission. Decision Date: 19 Oct 2020	St. Paul's College, Raheny	The development will consist of the following: construction of (i) a pergola structure consisting of a timber frame with retractable awning system above; (ii) sand and cement rendered block walls (0.8 m in height) with precast concrete capping to surround the proposed pergola structure; (iii) raised planted bedding along the block walls; and (iv) all site works necessary to facilitate the development. The proposed structure is located within the internal courtyard area at St. Paul's College.	The Planning Authority (DCC) granted permission for the development subject to 6 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, transport and drainage. Therefore, there are no cumulative impacts anticipated with this development.
3803/21 Decision: Grant Permission. Decision Date: 17 Feb 2022	The Society of Jesus	PROTECTED STRUCTURE: Permission for development at this site, which contains a Protected Structure known as Manresa House. The Proposed Development will consist of: 1) a new single storey, flat-roofed building located to the northeast of the protected structure, to provide for new reception, dining, cooking and associated ancillary spaces, with rooflights, solar panes and part sedum roof; 2) a new single-storey, flat-roofed open loggia structure forming a covered route from the existing Retreat Building to the proposed new building; 3) associated hard landscaping, including new terrace and external steps, 2no. disabled parking bays, and extensive planting works to the courtyard; 4) landscaping works, including the provision of 36 no. car-parking spaces, new planting to the west lawn and the formation of a new stormwater attenuation pond; and 5) the removal of an existing single-storey, pitched roof timber structure.	The Planning Authority (DCC) granted permission for the development subject to 12 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, surface water drainage and SuDS, transport, parking and maintaining the integrity of the protected structure. Therefore, there are no cumulative impacts anticipated with this development.
2038/18 Decision: Grant Permission. Decision Date: 08 Jan 2019	MKN Property Group	PROTECTED STRUCTURE: Permission for a residential development of 72 no. units across 4 no. blocks with a single level basement, consisting of the change of use of the existing Verville Retreat building from nursing home use to residential use and the change of use of the existing former outbuilding to residential use. The overall development will comprise of the following: Block A: construction of a 4 storey building (3 storeys with a setback fourth storey) comprising 14 no. apartments (12 no. 2 bedroom units and 2 no. 3 bedroom units) with balconies/terraces to the north and south elevations; Block B: The change of use of the existing 4 storey Verville Retreat building from nursing home use to residential use comprising 9 no. apartments (3 no. 1 bedroom units and 6 no. 2 bedroom units). Demolition of later additions and extensions to the existing Verville Retreat	The Planning Authority (DCC) granted Retention Permission under planning ref. no. 3081/20 on 28 Oct 2020. The development is subject to the conditions of the original planning grant, with additional conditions relating to drainage. Therefore, there are no cumulative impacts anticipated with this development.

Planning Ref No.	Applicant Name	Summary of Development	Cumulative Impact Assessment
		<p>building as well as associated modifications to elevations and internal modifications/reconfiguration of the refurbishments to the existing building in order to accommodate the provision of the new apartment units and the construction of a new external stair core at the buildings eastern elevation; Block C: Construction of a 4 storey building (3 storeys with a setback fourth storey) comprising 48 no. apartments (1 no. studio apartment, 20 no. 1 bedroom units, 21 no. 2 bedroom apartments and 6 no. 3 bedroom apartments) with balconies/terraces to all elevations and roof garden; Block D: The conversion of the existing single storey outbuilding into 1 no. single storey, 2 bedroom mews dwelling with associated internal and external modifications to accommodate the proposed change of use; A basement level comprising a total of 69 no car parking spaces, 80 no. bicycle parking spaces, ancillary plant room and refuse storage areas; Revisions and improvements to the existing vehicular entrance to Vernon Avenue; Demolition of the existing single storey block to the north of Verville Retreat; landscaping (including communal and private open space); Boundary treatment; and, all associated engineering and site development works necessary to facilitate the development.</p>	
<p>4656/18 Decision: Grant Permission. Decision Date: 27 Mar 2019</p>	<p>Clontarf Hospital</p>	<p>Permission for development at Castle Avenue, Clontarf, Dublin 3. The development will consist of the removal of the existing maintenance portacabins and demolition of the existing hard standing area, removal of 4 young trees which will be replaced in the area to suit the development, removal of 3 car spaces and the construction of a single storey maintenance building including, workshop, office, store and bin store and associated site works adjacent to the existing services yard.</p>	<p>The Planning Authority (DCC) granted permission for the development subject to 12 no. condition(s). The conditions relate to working hours, noise control, public road cleaning, surface water drainage and SuDS, public infrastructure, public health and safety, amenity, ecology and sustainable development. Therefore, there are no cumulative impacts anticipated with this development.</p>

The cumulative effects of Proposed Development on Material Assets have been assessed taking other planned, existing, and permitted developments in the surrounding area into account. Good construction management practices, as detailed in the CEMP will minimise the risk of pollution and nuisance arising from construction activities at the Site. The works will be carried out in such a way that inconvenience to the public arising from increase in traffic flows and disruptive effects of construction traffic on local and main roads is limited wherever

practical. Each of the developments that have been permitted in the vicinity of the site (detailed in Table 12-29) are subject to conditions, which, when considered in conjunction with the Proposed Development, it is predicted that the cumulative effects the Proposed Development on surface water, foul water disposal, potable water supply, natural gas supply, electrical supply, telecoms, and municipal waste will be negligible.

12.2.5.10 “Do Nothing” Scenario

If the Proposed Residential Development is not advanced, the site will remain as a greenfield site. If the Proposed Development was not to proceed, there would be no increase in the demand on the existing water supply network and there would be no increase in wastewater discharging to the sewer network. Additionally, if the Proposed Development was not to proceed, there would be no increase in the demand on the existing power networks and there would be no increase in the demand on the existing waste management infrastructure. Hence, the effect of a “Do Nothing” scenario on the Material Assets of the study area would be neutral and imperceptible in the long term.

12.2.6 Avoidance, Remedial & Mitigation Measures

Specific avoidance, remedial and mitigation measures will be required for the Proposed Development. Waste management during the Construction Phase will be managed in accordance with the CDWMP prepared by Waterman Moylan (2022) for the Proposed Development. Waste will be managed in compliance with the Waste Management Act 1996 (as amended) and all subordinate legislation. Measures to minimise waste generation, promote re-use and recycling and recovery of wastes will be implemented throughout the Construction Phase.

Waste will be stored onsite in the dedicated waste segregation areas in such a manner as to:

- Prevent environmental pollution.
- Minimise nuisance generation such as dust.
- Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling, and recovery.

Waste segregation areas, particularly those containing flammable wastes, will be located away from any potential sources of ignition (i.e., hot works zones), and no smoking will be allowed onsite, in order to prevent fire outbreak in waste segregation areas.

In the event that hazardous soil, or historically deposited waste is encountered during the site bulk excavation phase, the contractor will notify DCC and provide a Hazardous/Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal/treatment, in addition to information on the proposed authorised waste collector(s). This soil will then be removed by an appropriately accredited contractor and disposed of at an appropriately accredited facility.

12.2.6.1 “Worst Case” Scenario

The worst-case scenario where mitigation measures fail for the Proposed Development, it is considered that localised nuisances may arise if construction works resulted in an extended power or telecommunications outage, or disruption to water supply or sewerage systems for existing properties in the area due to unforeseen delays on site. Alternatively, if an unclassified hazardous waste stream were to arise on the site during excavations, which resulted in the

contamination of a large volume of non-hazardous wastes, such as soil and stones, this would require specialist removal and treatment. However, taking account of the avoidance and mitigation measures, these scenarios are considered highly unlikely and indeterminable.

12.2.7 Residual Impacts

Residual Impacts are defined as “*effects that are predicted to remain after all assessments and mitigation measures*”. They are the remaining ‘environmental costs’ of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

Having regard to the mitigation measures proposed within this and other chapters of the EIAR, residual impacts from the Proposed Development on Material Assets in the study area are anticipated to be neutral and not significant in the long term.

12.2.8 Monitoring

12.2.8.1 Construction Phase

The monitoring of C&D waste during the Construction Phase of the Proposed Development is recommended to ensure that impacts are not experienced beyond the site boundary. The Main Contractor will be responsible for monitoring and record keeping in respect of waste leaving the facility and that these records will be maintained on site. These monitoring measures are standard protocol and no additional, specific monitoring is required.

12.2.8.2 Operational Phase

The building management company, residents, tenants, childcare facility and nursing home operators will be required to maintain the bins and storage areas in good condition as required by the DCC Waste Bye-Laws. The waste strategy presented in the OWMP will provide sufficient storage capacity for the estimated quantity of segregated waste. The designated areas for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy. The areas will be fitted with CCTV for monitoring.

12.2.9 Interactions

The Proposed Residential Development will provide additional housing in a densely populated urban area. Material assets, utilities and waste interact with other environmental receptors as follows:

12.2.9.1 Population and Human Health

In the absence of mitigation, the improper removal, handling and storage of waste could negatively impact on the health of construction workers. Extended power or telecommunications outages, or disruption to water supply or sewerage systems for existing properties in the area could negatively impact on the surrounding human population and their overall health. Chapter 4 (Population and Human Health) of this EIAR has concluded that the likely significant effects will be negligible with mitigation measures..

12.2.9.2 Biodiversity

The improper handling and storage of waste during the Construction and Operational Phases could negatively impact on biodiversity, as small mammals may become entangled in waste

materials, however, Chapter 5 (Biodiversity) of this EIAR has concluded that provided all mitigation measures are implemented in full and remain effective throughout the lifetime of the facility, no significant negative residual impacts on the biodiversity of the study area are expected from the Proposed Development..

12.2.9.3 Water (Hydrology & Hydrogeology)

Any connections to the public water network (water supply or foul sewer) during the Construction and Operational Phases will be under consent from Irish Water. Potential impacts on water are addressed in Chapter 7 (Water) of this EIAR, which concludes that there are no likely significant adverse residual impacts on hydrology and hydrogeology anticipated regarding this Proposed Development.

12.2.9.4 Traffic

Waste collection activities at the Proposed Development have the potential to impact upon traffic movements in the Raheny and Clontarf areas. Potential impacts on traffic are addressed in Chapter 12.1 of this EIAR.

12.2.10 Difficulties Encountered When Compiling

No difficulties were encountered in the preparation of this Chapter.

12.2.11 References

- Environmental Protection Agency (EPA) (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)
- EPA (2003) Advice Notes on Current Practice in the preparation of Environmental Impact Statements.
- EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements.
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Communities 1999)
- <https://siteviewer.comreg.ie/#explore> (ComReg, 2021). Commission for Communications Regulation Mast Viewer. Consulted on 04.01.2022.
- <https://www.gov.ie/en/publication/5634d-national-broadband-plan-map/> Consulted on 04.01.2022.
- <https://www.gasnetworks.ie/corporate/company/our-network/pipeline-map/> (Gas Networks Ireland, 2021). Gas Networks Ireland Pipeline Viewer. Consulted on 04.01.2022.
- <https://myplan.ie/> (DHLGH, 2021) Zoning and National Planning Applications Map Viewer. Consulted on 04.01.2022

- National Standards Authority of Ireland (NSAI), 2017. IS EN752, "Drain and Sewer Systems Outside Buildings – Sewer system Management. NSAI, 1 Swift Square, Northwood, Santry, Dublin 9
- Ordnance Survey Ireland, 2020 (OSI, 2021). Ordnance Survey Ireland webmapping <https://geohive.maps.arcgis.com/apps/webappviewer/index.html> Consulted on 04.01.2022.

13 RISK MANAGEMENT

13.1 Study Methodology

13.1.1 Scope and Context

The relevant legislation that applies to this Chapter is the Planning and Development Regulations 2001 – 2021, as amended, and in particular Schedule 6 – Information to be contained in EIAR. The following paragraph of Schedule 6, Paragraph 2(e)(i)(IV), specifically refers to "*a description of the likely significant effects on the environment of the Proposed Development resulting from ... the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)*".

Paragraph 2(h) further expands with "*a description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive or relevant assessments carried out pursuant to national legislation may be used for this purpose, provided that the requirements of the Environmental Impact Assessment Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for, and proposed response to, emergencies arising from such events.*"

Additionally, the Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), which implement the Seveso III Directive (2012/18/EU), and which revoked the 2006 Major Accident Regulations also applies to this Chapter.

This Chapter was prepared by Nikita Coulter, Senior Environmental Consultant with Enviroguide Consulting. Nikita Coulter has a B.Sc. in Zoology (Hons) from University College Dublin, an M.Sc in Biodiversity and Conservation, a Postgraduate Diploma in Environmental Engineering from Trinity College Dublin, and a NEBOSH accredited International Diploma in Environmental Risk Management. Nikita has 8 years professional experience as an Environmental Compliance Specialist.

13.1.2 Guidelines and Reference Material

Cognisance has been taken of the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022). This document follows the requirements laid out in the Directive 2014/52/EU.

Specifically, the EPA Guidelines state that the EIAR must take account of "*the vulnerability of the project to risk of major accidents and /or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk)... The potential for a project to cause risks to human health, cultural heritage or the environment due to its vulnerability to external accidents or disasters is considered where such risks are significant, e.g. the potential effects of floods on sites with sensitive plants. Where such risks are significant then the specific assessment of those risks in the form of a Seveso Assessment (where relevant) or Flood Risk Assessment*

may be required. The EIAR should refer to those separate assessments while avoiding duplication of their contents.”

Reference has also been made to the Department of the Environment, Heritage & Local Government (DoEHLG) Publication ‘Guide to Risk Assessment in Major Emergency Management 2010’ and the Office of Emergency Planning, Department of Defence (DOD) Publication ‘A National Risk Assessment for Ireland 2020’. A consolidated list of national hazards for Ireland identified in the DOD document are identified in Table 13-1.

Table 13-1 Consolidated List of National Hazards (Source: A National Risk Assessment for Ireland (2020) Department of Defence)

<p>Hazard: Civil</p> <ul style="list-style-type: none"> • Large Crowd Event • Pandemic • Water Supply Distribution and Contamination • Food Chain Contamination • Animal Disease • Terrorist Incident 	<p>Hazard: Natural</p> <ul style="list-style-type: none"> • Storm • Snow and Ice (Including prolonged low temperature) • Flooding (Including pluvial, fluvial and coastal)
<p>Hazard: Transportation</p> <ul style="list-style-type: none"> • Maritime Incident • Air Incident • Transport Hub (Includes Airports, Ports and Rail Stations) 	<p>Hazard: Technological</p> <ul style="list-style-type: none"> • Structural Collapse (Including Dam, Tunnel, Bridge and Building) • Nuclear Incident (Abroad) • Cyber Incident • Disruption of Energy Supply (Including oil, gas, electricity and communications)

13.1.3 Risk Assessment Methodology

The risk assessment methodology has been supported by general risk assessment methods. Hazard analysis and risk assessment are accepted internationally as essential steps in the process of identifying the challenges that may have to be addressed by society, particularly in the context of emergency management. Mitigation as a risk treatment process involves reducing or eliminating the likelihood and/or the impact of an identified hazard (DoEHLG, 2010).

Table 13-1 Classification of National Likelihood Criteria (Source: A National Risk Assessment for Ireland (2020) Department of Defence)

National Likelihood Criteria		
Rating	Classification	Average Recurrence Interval
1	Extremely Unlikely	100 or more years between occurrences
2	Very Unlikely	51-100 year between occurrences
3	Unlikely	11-50 years between occurrences
4	Likely	1-10 years between occurrences
5	Very Likely	Ongoing/Less than 1 year between occurrences

13.2 Predicted Impacts

The EIAR chapters within this report identify that the Proposed Development has been designed in accordance with best practice and that the Proposed Development can be safely undertaken without risk to health.

In order to understand the potential consequences and predicted impacts of any major accident or disaster due to the Proposed Development and the vulnerability of the project a desk study was undertaken. The assessment reviewed:

- The vulnerability of the project to major accidents or disasters.
- The potential for the project to cause risks to human health, cultural heritage and the environment, as a result of that identified vulnerability.

A methodology has been used including the following phases:

Phase 1 Assessment:

The DOD Consolidated List of National Hazards was used to identify a preliminary list of potential major accident and disasters. Receptors covered by legislation were not included within the assessment e.g. construction workers.

Phase 2 Screening:

The list was screened and major events such as volcanoes were not included given the unlikely event of one occurring. Elements already addressed as a key part of the design e.g. risks of building collapse, are not repeated.

Phase 3: Mitigation and Evaluation

In the event that mitigation measures included did not mitigate against the risk, then, the potential impacts on receptors are identified in the relevant chapter. Table 13-3 lists the major accidents and/or disasters reviewed.

Table 13-2: Major Accidents and/or Disasters Reviewed

Major Accident or Disaster	Relevant for this Proposed Development? (Y/N)	Why relevant?	Potential Receptor	Covered within EIAR?
Civil				
Large Crowd Event		Not considered vulnerable	N/A	N/A
Pandemic	Y	<p>COVID-19 is an illness that can affect your lungs and airways. It is caused by a virus called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). SARS-CoV-2 is spread in sneeze or cough droplets. The Proposed Development poses no additional COVID-19 risk.</p> <p>It is anticipated that there will be approximately 300 jobs created by the Construction Phase, with a maximum of 150 construction workers onsite at any one time at the peak of the construction works. Additionally there will be approximately 135 jobs created during the Operational Phase. During the Construction and Operational Phases of this Proposed Development, HSE guidelines will be adhered to as relevant.</p> <p>All workers directly and indirectly employed during the Operational Phase of the Proposed Development will comply with the relevant Government protocols that will be in place at that point in time in relation to COVID-19.</p>	Employees	Chapter 4 Population & Human Health

Water Supply Distribution and Contamination	Y	Not considered vulnerable. Waterborne diseases can be caused by consuming contaminated drinking water. A potable water supply will be supplied to the Proposed Development via a connection to Irish Water supply.	Employees Residents	Refer to Chapter 7 Water and Hydrology and Chapter 12 Material Assets for information on water supply.
Food Chain Contamination	N	Not considered vulnerable	N/A	N/A
Animal Disease	N	Not considered vulnerable	N/A	N/A
Terrorist Incident	N	Not considered vulnerable	N/A	N/A
<u>Transportation</u>				
Maritime Incident	N	Not considered vulnerable, as the site is approximately 1.5km from the coast.	N/A	N/A
Air Incident	N	Not considered vulnerable. The closest commercial airport is Dublin Airport, which is approximately 6km from the Site.	N/A	Public Safety Zones for Dublin Airport are assessed in Section 13.3 of this Chapter.
Transport Hub (Includes Airports, Ports and Rail Stations)	N	Not considered vulnerable. The proposed Site is not considered a transport hub.	N/A	N/A
<u>Natural</u>				
Cultural, Archaeological and Architectural Heritage	N	Not considered vulnerable. There are no protected structures or conservation areas located within the Site of the Proposed Development.	N/A	Chapter 10 (Archaeology and Cultural Heritage) of this EIA assessed the impact of the Proposed Development on the Archaeological and Cultural Heritage.
Landslides	N	The potential for landslides was already considered within the design therefore no future assessment or potential required.	N/A	Chapter 6 (Land and Soils) of this EIA assessed the vulnerability of the Proposed Development to landslides.

Sinkholes	N	The potential for sinkholes was already considered within the design therefore no future assessment or potential required.	N/A	Chapter 6 (Land and Soils) of this EIAR assessed the vulnerability of the Proposed Development to sinkholes.
Earthquakes	N	Area is not geologically active.	N/A	N/A
Floods/Storm surge/tidal flooding	Y	A Site Specific Flood Risk Assessment was conducted for the site of the Proposed Development, and concluded: The likelihood of tidal flooding is extremely low and no mitigation is required. The likelihood of fluvial flooding is extremely low and no mitigation is required. The likelihood of pluvial flooding ranges from low to high and mitigation measures include implementing appropriate drainage design, SuDS and attenuation design, setting appropriate floor levels and overland flood routing. The likelihood of groundwater flooding is low if appropriate mitigation measures are put in place including setting appropriate floor levels, flood routing and damp proofing membranes.	Residents/ workers/ service users/ members of the public/ the development	Chapter 7 (Hydrology) of this EIAR and the Site Specific Flood Risk Assessment (Waterman Moylan, 2022) identifies the vulnerability of the project to flooding.
Severe weather such as Tornados, Heatwaves, Blizzards and Droughts	N	Not considered vulnerable. A Microclimate Assessment was carried out to evaluate the predicted performance of the buildings and the impact of the buildings on microclimate (B-Fluid, 2021). The Proposed Development will not introduce any critical impact on the surrounding buildings, or nearby adjacent roads In the event of severe weather events, the national meteorological service, Met Éireann, provides advance notice of severe weather, usually several days in advance. When appropriate, colour-coded weather warnings are issued. The Office of Emergency Planning works with the government departments and other key public authorities in order to ensure the best possible use of resources and compatibility across different emergency planning requirements.	N/A	N/A
Air Quality events	Y	Vehicular emissions Dust emissions	Residents/ workers	Chapter 8 (Air Quality) of this EIAR identifies the impact of the construction and operation of the development on

				ambient air quality.
Wildfires	N	Not relevant. A landscape plan has been completed for the Proposed Development.	N/A	N/A
Dam, Bridge or Tunnel Failure	N	Not considered vulnerable as none are present on the site of the Proposed Development or proposed as part of the scheme.	N/A	N/A
Flood defence failure	N	Appropriate drainage design, SuDS and attenuation design, setting appropriate floor levels and overland flood routing have all been included in the design of the Proposed Development and will be installed according to appropriate regulations and best practise guidelines.	Residents/ workers/ service users/ members of the public/ the development	Chapter 7 (Hydrology) of this EIAR and the Site Specific Flood Risk Assessment (Waterman Moylan, 2022) identifies the vulnerability of the project to flooding.
Fire	Y	The risk of fire might lead to loss of life.	Residents, service users, members of the public & nearby properties.	Section 13.3.1 of this Chapter deals with Fire Safety. A Preliminary Fire Safety and Access & Use Strategy' has been prepared by Maurice Johnson & Partners (2021).
Invasive species	N	Not considered vulnerable	N/A	Chapter 5 (Biodiversity) of this EIAR has assessed invasive species.
Technological				
Structural Collapse (Building)	N	This has been taken into consideration in the building design. All buildings have been designed to modern standards. No further assessment is required.	Residents / Employees	The design criteria of the buildings are in accordance with all relevant building design standards.
Nuclear incident	N	Not considered vulnerable	N/A	N/A
Cyber incident	N	Not considered vulnerable	N/A	N/A
Disruption to energy supply (oil, gas, electricity)	N	Not considered vulnerable	N/A	Chapter 12 (Material Assets) of this EIAR contains information on energy systems.
Utilities failure (communications)	N	Not considered vulnerable	N/A	Chapter 12 (Material Assets) of this EIAR contains information on communications systems.

Utilities failure (water supply)	N	Not considered vulnerable	N/A	Chapter 7 (Hydrology) and Chapter 12 (Material Assets) of this EIAR contain information on water supply
Utilities failure (wastewater, sewage)	N	Not considered vulnerable	N/A	Chapter 7 (Hydrology) and Chapter 12 (Material Assets) of this EIAR contain information on wastewater and sewage removal and treatment
Utilities failure (solid waste)	N	Not considered vulnerable	N/A	Chapter 12 (Material Assets) of this EIAR contains information on solid waste removal and treatment
Industrial accidents (defence, energy, oil and gas refinery, food industry, chemical industry, manufacturing, quarrying, mining)	N	There are no Upper Tier Seveso sites near the Proposed Development. The closest is located approximately 2.5km from the Proposed Development at Dublin Port.	N/A	N/A

13.3 Management Plans

13.3.1 Fire Safety and Emergency Response Plans

13.3.1.1 Construction Phase

Sufficient labour and resources will be arranged for the project, together with sufficient security arrangements to ensure safe access and egress of construction staff. Co-ordination of works will be required with others in the active buildings in terms of the emergency escape arrangements as the project progresses.

13.3.1.2 Operational Phase

A 'Preliminary Fire Safety and Access & Use Strategy' report has been prepared for the Proposed Development by Maurice Johnson & Partners, Fire Safety Engineering & Access Consultants (2021). The report details the means of escape in case of fire from the residential buildings, the nursing home, the childcare facility and the various amenity spaces.

A Building Lifecycle Report (Aramark, 2022) has been prepared for the Proposed Development which reviews the outline specification of materials and infrastructure to be utilised for the Proposed Development. Protective Services that will be installed in the Proposed Development are listed within report and include:

- Fire alarms
- Fire extinguishers
- Apartment sprinkler system (where applicable by fire cert)
- Dry risers, and
- Firefighting lobby ventilation.

Fire alarms, fire extinguishers and fire blankets will be installed in all internal areas. All fire alarms will be in accordance with the current IS3218:2013 + A1 2019 and the Fire Certificate, and all fire extinguishers will meet the requirements of I.S 291:2015 – Selection, Commissioning, Installation, Inspection and Maintenance of Portable Fire Extinguishers. A sprinkler system will be installed in the apartments in accordance with BS 9251:2005 – Sprinkler Systems for Residential and Domestic Occupancies – Code of Practice (as amended). Dry Risers are a system of empty pipes and valves that can be connected externally to a pressured water source by emergency services and firefighters in the event of a fire. They will be installed in the common area cores of the apartment blocks. The Dry Risers will be installed in accordance with BS 5041 – Fire Hydrant Systems Equipment & BS 9999 – Effective Fire Safety in the Design, Management and Use of Buildings. Fire-fighting ventilation consisting of smoke extract/exhaust systems will be installed in the common area lobbies to the fire consultants design and specification (Aramark, 2022).

The individual residential units will each be designed as standalone compartments fire separated from all adjoining accommodation. The basement and podium car parks and ancillary accommodation will also be compartmented from the various Blocks overhead. The nursing home building will be compartmented from the car parks and will also be sub-divided into compartments to allow for progressive horizontal evacuation (Maurice Johnson & Partners, 2021).

13.3.2 Traffic Management Plan

13.3.2.1 Construction Phase

A Traffic Management Plan will be developed by the Main Contractor for the Construction Phase of the Proposed Development. A 'just in time' delivery system will avoid a backup of traffic on approach. Additionally, a booking system will be considered, whereby contractor deliveries and collections can be managed to avoid traffic delays. The Construction Phase Traffic Management Plan will include segregation of construction vehicles from staff and visitor vehicles that will be present on the site. The Main Contractor will be responsible for ensuring that all access routes to the college and Vincentian Community Residence are kept clear of obstruction and that suitable traffic and pedestrian warning signage is in place.

13.3.2.2 Operational Phase

A Travel Plan has been developed for the Operational Phase of the Proposed Development by Waterman Moylan (2022). The implementation of the strategy proposed in the Travel Plan, such as the provision of secure cycle parking spaces; up-to-date information of public transport routes and bus stop locations; information about bike to work scheme to all residents; will encourage residents to reduce dependency of private car and increase the travel by green modes of transport. These measures will not only benefit the residents but will also prevent any transport impacts that can be provoked by the operational phase of the Proposed Development.

13.3.3 Public Safety Zones

Public Safety Zones (PSZs) are mapped out around airport runways to protect the public on the ground from possible aircraft crashes in populated area. PSZs are used to prevent inappropriate use of land where the risk to the public is greatest, e.g., by limiting the type and allowable height of buildings and structures within the zones.

Two individual risk factors relating to chance of death by aircraft crash have been assessed in determining appropriate Public Safety Zones (PSZs) at Dublin Airport. The inner PSZ risk value is 1 in 100,000 per year and the outer PSZ risk value is 1 in 1,000,000 per year, for each runway.

The Site of the Proposed Development is located approximately 6km to the southeast of Dublin Airport. There are no PSZs directly over the Site of the Proposed Development. The nearest PSZ is an outer PSZ which is located approximately 4km to the north of the Site of the Proposed Development. The PSZs at Dublin Airport and the location of the Site of the Proposed Development are shown in Figure 13-1. Based on the locations of the PSZs in relation to the Proposed Development, an aircraft strike disaster is not considered relevant to this Proposed Development.

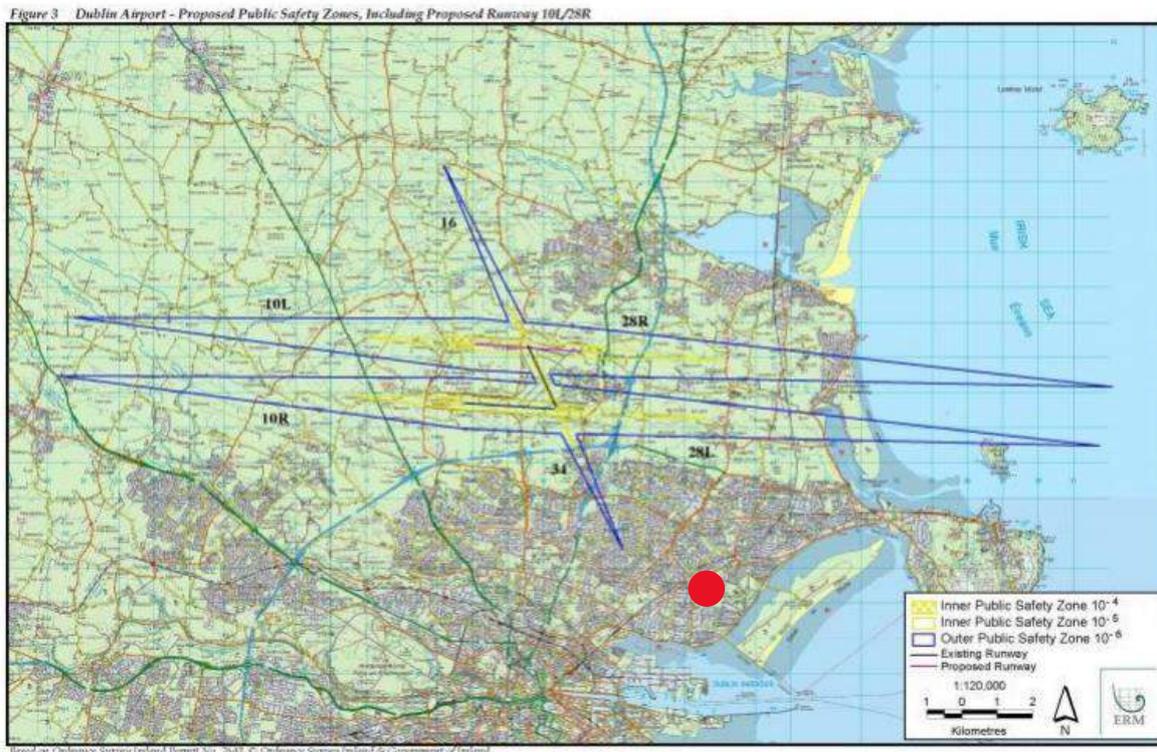


Figure 13-1 Dublin Airport Public Safety Zones – the approximate location of the site of the Proposed Development is represented by a red dot

13.4 Residual Impacts

Control measures observed for health and safety and environmental management as per relevant code of practices (Code of Practice for Inspecting and Certifying Buildings and Works) and relevant legislation including Building Control Act 1990 (No. 3 of 1990), as amended and Building Control Regulations 1997, as amended. The residual impacts will be negligible once all control, mitigation and monitoring measures have been implemented.

13.5 Monitoring

There is no monitoring required regarding risk management. All monitoring proposals for the interacting chapters have been detailed in the relevant technical chapters and are included in Chapter 15 Mitigation Measures and Monitoring.

13.6 Conclusions

The design has considered the potential for flooding, road accidents or fire within the design methodology. The vulnerability of the Proposed Development to major accidents and/or disasters is not considered significant.

13.7 Difficulties Encountered When Compiling

No difficulties were encountered when preparing this chapter.

13.8 References

Chapter 4-12 of Volume 2 of this EIAR

Environmental Resources Management Ireland Ltd (2005) Public Safety Zones Report

EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

Garda Mapping Section – Seveso Sites Ireland WebMap [Viewed Online 05.07.2022]
<https://www.arcgis.com/home/item.html?id=a01b5a0a6ff24f10adff30beaa3b6fd0>

Office of Emergency Planning (2020) 'A National Risk Assessment for Ireland 2020'
Department of Defence Publication

Statutory Instrument (SI). No. 296/2018 - European Union (Planning and Development)
(Environmental Impact Assessment) Regulations 2018

14 INTERACTIONS

14.1 Introduction

As a requirement of Planning Regulations and the Environmental Protection Agency's 'Guidelines on information to be contained in Environmental Impact Assessment Reports' (2017), interrelationships between various environmental aspects must be considered when assessing the impact of the Proposed Development, as well as individual significant impacts. The significant impacts of the Proposed Development and the proposed mitigation measures have been detailed in the relevant chapters of this report. However, as with all developments that pose potential environmental impacts, there also exists potential for interactions/interrelationships between the impacts of different environmental aspects. The results may exacerbate or ameliorate the magnitude of impacts. This chapter of the EIAR addresses the interactions between the various environmental factors of the Proposed Development.

The following Section is directed by Article 3 section 1(e) of the EIA Directive. The EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (Draft, 2017) and Advice Notes for Preparing Environmental Impact Statements (Draft, September 2015) were also considered.

Article 3 of the Directive states:

1. The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:
 - a) population and human health;
 - b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
 - c) land, soil, water, air and climate;
 - d) material assets, cultural heritage and the landscape;
 - e) the interaction between the factors referred to in points (a) to (d)

14.2 Study Methodology

The interactions between impacts on different environmental factors have been addressed throughout this EIAR. Close co-ordination and management with the EIAR team was carried out to ensure that all likely relevant interactions were addressed at the scoping stage of the EIAR and interactions have been adequately assessed.

Following an assessment of the EIAR, a matrix was produced to display where interactions between impacts on different factors have been addressed. This has been carried out by use of chapter headings included in the EIAR and details of any interaction during all phases of the Proposed Development.

14.3 Interactions

The following matrix has been produced to show where potential significant interactions between effects on different factors have been addressed, see Table 14-1.

As this EIAR has been prepared by a number of specialist consultants, an important aspect of the EIA process was to ensure that interactions between the various disciplines have been taken into consideration. The principal interactions requiring information exchange between the environmental specialists and the design team are summarised below in Table 14-2 to Table 14-10.

Table 14-1: Interactions between Factors

Interaction	4. Population and Human Health	5. Biodiversity	6. Land and Soil	7. Hydrology and Hydrogeology	8. Air Quality and Climate	9. Noise and Vibration	10. Landscape and Visual Amenity	11. Archaeology, Architecture and Cultural Heritage	12.1 Material Assets (Traffic)	12.2 Material Assets (Waste & Utilities)
Population and Human Health	N/A	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction
Biodiversity	Interaction	N/A	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction
Land and Soil	Interaction	Interaction	N/A	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction
Hydrology and Hydrogeology	Interaction	Interaction	Interaction	N/A	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction
Air Quality and Climate	Interaction	Interaction	Interaction	Interaction	N/A	Interaction	Interaction	Interaction	Interaction	Interaction
Noise & Vibration	Interaction	Interaction	Interaction	Interaction	Interaction	N/A	Interaction	Interaction	Interaction	Interaction
Landscape & Visual Amenity	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	N/A	Interaction	Interaction	Interaction
Archaeology, Architectural and Cultural Heritage	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	N/A	Interaction	Interaction
Material Assets (Traffic)	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	N/A	Interaction
Material Assets (Waste & Utilities)	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	Interaction	N/A

	No Interaction
	Interaction
	N/A

Table 14-2 Population and Human Health

Population and Human Health	
Summary	
<p>Chapter 4 of this EIAR, <i>Population and Human Health</i>, details the potential direct and indirect impacts of the Proposed Development on Population and Human Health; and sets out any required mitigation measures where appropriate.</p> <p>The population in the vicinity of the Site of the Proposed Development has been assessed in terms of demography, economic activity and employment, tourism and amenity, landscape and visual, human health and social health.</p>	
Interactions	
Noise and Vibration	<p>Construction activities such as site clearance, building construction works, and trucks and vehicles entering and exiting the Site have the potential to interact with the surrounding population and human health and cause noise disturbance. The impact assessment of noise and vibration has concluded that additional noise associated with the construction and operational phase will not cause a significant impact. The operation of on-site machinery will be intermittent and last only for the duration of the Construction Phase. As such, there will be no significant impact on population and human health. The operational noise and vibration impact is not significant with a neutral effect. Noise is fully assessed in Chapter 9 of this EIAR.</p>
Hydrology	<p>Pollution events can impact the water quality and thus impact the human health of the surrounding population. Appropriate surface water and foul water control measures will be implemented as part of the Proposed Development. No public health issues associated with the water conditions at the Site have been identified for the Construction Phase or Operational Phase of the Proposed Development. There are no likely significant adverse impacts as a result of Hydrology and as such there will be no significant impacts on population and human health. Hydrology has been fully assessed in Chapter 7 of this EIAR.</p>
Land and Soil	<p>Dust from the site and from soil spillages on the existing road network around the site may impact human health, especially during dry conditions. Best practise measures and mitigation measures have been identified in Chapter 6 of this EIAR. No significant impacts are predicted in relation to land and soil and as such there will be no significant impact on population and human health.</p>
Air Quality and Climate	<p>Interactions with air quality during the construction and operational phase has the potential to cause dust nuisance issues impacting on human health. However, Chapter 8 has concluded that there will be no significant air quality impacts. All ambient air quality legislative limits will be complied with and therefore the predicted impact is not significant with a neutral effect on human health. Air quality is discussed further in Chapter 8 of this EIAR.</p>

<p>Material Assets – Traffic</p>	<p>Construction activities will result in an increased number of HGV movements during the Construction Phase. The Proposed Development will also result in an increase in the population of the surrounding area and subsequently an increase in the number of vehicles. There is potential for significant impacts on population and human health in relation to the capacity and operation of the surrounding road network.</p> <p>No traffic routes are predicted to experience increases of more than 25% in total traffic flows during the Operational Phase. The overall impact of the Proposed Development on the transportation infrastructure in the local area will be minimal.</p>
<p>Material Assets – Waste and Utilities</p>	<p>The improper removal, handling and storage of hazardous waste has the potential to negatively impact on the health of construction workers. The Preliminary Construction and Demolition Waste Management Plan (CDWMP) (Waterman Moylan, August 2022) and CEMP (Enviroguide, August 2022) details mitigation measures to ensure the safety of the workers. Extended power or telecommunications outages, or disruption to water supply or sewerage systems for existing properties in the area could negatively impact on the surrounding human population and their overall health. Chapter 12 of this EIAR has concluded there will be no significant impacts on the Material Assets (Waste and Utilities) as a result of the Proposed Development subsequently there will be no significant impact on population and human health.</p>
<p>Landscape and Visual</p>	<p>The Proposed Development will alter the visual appearance of the Site which is predominantly a greenfield Site. It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the Site of the Proposed Development and the rural and residential nature of the surrounding landscape, will not cause any significant impacts and as such there will be no significant impact on population and human health.</p>
<p>Conclusions</p>	
<p>The Proposed Development has the potential to provide employment opportunities and health improvements. Employment and income are among the most significant determinants of long-term health, influencing a range of factors including the quality of housing, education, diet, lifestyle, coping skills, access to services and social networks.</p> <p>The Proposed Development will result in a number of new jobs being created. It is proposed approximately 300 jobs will be created during the Construction Phase and that approximately 135 jobs will be created during the Operational Phase of this development having both a direct and indirect positive impact on the local economy and employment.</p> <p>The Proposed Development will also create additional indirect employment for example at shops, cafes, fuel stations etc. in the vicinity of the Proposed Development. The Proposed Development will have a slight positive effect in terms of additional direct and indirect employment and on the local socio-economic environment.</p>	

Table 14-3: Biodiversity

Biodiversity	
Summary	
<p>Chapter 5 of this EIAR, <i>Biodiversity</i>, details the potential direct and indirect impacts of the Proposed Development on habitats, flora and fauna associated with Site of the Proposed Development.</p> <p>Based on an Appropriate Assessment Screening report which was carried out in relation to the Proposed Development and accompanies this application, it was concluded that the possibility may be excluded that the Proposed Development will have a significant effect on any of the European Sites listed below:</p> <ul style="list-style-type: none"> • South Dublin Bay SAC (000210) • Baldoyle Bay SAC (000199) • Howth Head SAC (000202) • Rockabill to Dalkey Island SAC (003000) • Malahide Estuary SAC (000205) • Ireland's Eye SAC (002193) • Rogerstown Estuary SAC (000208) • Ireland's Eye SPA (004117) • Howth Head Coast SPA (004113) • Dalkey Islands SPA (004172) <p>However, the possibility may not be excluded that the Proposed Development will have a likely significant effect on the following sites and accordingly a Natura Impact Statement (NIS) has been prepared:</p> <ul style="list-style-type: none"> • North Dublin Bay SAC (000206) • North Bull Island SPA (004006) • South Dublin Bay and River Tolka Estuary SPA (004024) • Baldoyle Bay SPA (004016) • Malahide Estuary SPA (004025) • Rogerstown Estuary SPA (004015) 	
Interactions	
Hydrology and Hydrogeology	<p>The interactions identified are between hydrology and water and biodiversity with respect to the potential impact of water pollution on protected areas. This is addressed in further detail in the NIS that accompanies this application under separate cover.</p>
Land and Soil	<p>An assessment of the potential impact of the Proposed Development on land and soils is outlined in Chapter 6 – Land and Soils. These impacts are considered to be relevant to the ecological sensitivities associated with the Site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are described in full in Chapter 6.</p>

Air Quality and Climate	<p>An assessment of the potential impact of the Proposed Development on Air Quality and Climate is outlined in Chapter 8 - Air Quality and Climate. Designated sites of ecological conservation importance, including SPAs, SACs, NHAs and nature reserves, within 200m of the Affected Road Network (ARN) are required to be included in the air quality assessment. No sites of ecological conservation importance have been identified within 200m of the ARN; therefore, this analysis has been excluded in the current assessment and significant effects are not expected to occur. Therefore, the impact of the interaction between air quality and climate and biodiversity is insignificant.</p>
Material Assets: Waste and Utilities	<p>An assessment of the potential impact of the Proposed Development on Waste Management is outlined in Chapter 12.2 – Material Assets: Waste and Utilities. These impacts are considered to be relevant to the protection of small mammals which may become entangled or trapped in construction waste in the absence of mitigation, as discussed in this Chapter; and mitigation measures addressing these potential impacts are described in full in Chapter 12.</p>
Landscape and Visual	<p>The landscaping proposed for the Site entails the planting of over 700 trees, many of which are native species. This increase in tree cover across the Site will provide additional nesting/foraging resources for local passerines, along with a slight increase in habitat connectivity over what is currently open field habitat.</p>
Conclusions	
<p>Based on the the mitigation measures out-lined in the NIS, when implemented, will ensure that no adverse effects on the Natura 2000 sites will arise during the construction stage of the Proposed Development or as a consequence of run-off of sediment/silt or contaminated waters into the Naniken River during the construction stage of the Proposed Development.</p>	

Table 14-4: Land and Soils

Land and Soil	
Summary	
<p>Chapter 6 of this EIAR, <i>Land and Soil</i>, details the potential direct and indirect impacts of the Proposed Development on the local land, soils, and geology; and sets out any required mitigation measures where appropriate.</p> <p>The removal of topsoil during earthworks and the construction of roads, services and buildings, in particular basements and foundations, will expose subsoil to weathering and may result in the erosion of soils during adverse weather conditions. Surface water runoff from the surface of the excavated areas may result in silt discharges to the Naniken River.</p> <p>Excavations for basements, foundations, roadworks and services will result in a surplus of subsoil. Surplus subsoil will be used in fill areas where applicable.</p> <p>Dust from the site and from soil spillages on the existing road network around the site may be problematic, especially during dry conditions.</p> <p>Accidental oil or diesel spillages from construction plant and equipment, in particular at refuelling areas, may result in oil contamination of the soils and underlying geological structures.</p> <p>During the operational stage of the development, it is not envisaged that there will be any ongoing impacts on the underlying soil as a result of the Proposed Development. Any hydro-geological impacts are temporary and associated with the construction of the Proposed Development.</p> <p>No negative residual impacts in the context of land, soils and geology are anticipated regarding this Proposed Development.</p>	
Interactions	
Population and Human Health	<p>Dust from the site and from soil spillages on the existing road network around the site may impact human health, especially during dry conditions. Dampening down measures with water sprays will be implemented during periods of dry weather to reduce dust levels arising from the development works.</p> <p>It is noted that specific issues relating to Population and Human Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.</p>
Hydrology and Hydrogeology	<p>Accidental oil or diesel spillages from construction plant and equipment, in particular at refuelling areas, may result in oil contamination of the soils and underlying geological structures, including surface water and groundwater. Measures will be implemented throughout the construction stage to prevent contamination of the soil and adjacent watercourses from oil and petrol leakages.</p> <p>An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 7 of this EIAR.</p>

Traffic	Excess soil excavated during construction works for the development will be transported by road for disposal in approved locations as provided for in this EIAR. Movements of construction traffic will be managed in accordance with the Construction Traffic Management Plan.
Biodiversity	Accidental oil or diesel spillages from construction plant and equipment may impact local flora and fauna. Such spills will be mitigated in accordance with Chapter 5 of this EIAR.
Noise and Vibration	Heavy machinery used for excavations may impact on noise and vibration. Both will be controlled and monitored as set out in Chapter 9 of this EIAR.
Air Quality and Climate	Dust from the site and from soil spillages on the existing road network around the site may impact air quality, especially during dry conditions. Dampening down measures with water sprays will be implemented during periods of dry weather to reduce dust levels arising from the development works. Air Quality will be controlled and monitored as set out in Chapter 8, <i>Air Quality and Climate</i> , of this EIAR.
Material Assets: Waste and Utilities	Excess soil excavated during construction works, including any potential contaminated soils, will be managed and disposed of in approved locations as provided for in this EIAR.
Conclusions	
With the protective measures noted in the respective chapters above in place during excavation works, any potential impacts on land and soils in the area will not have significant adverse impacts, and no significant adverse impacts on the soils and geology of the subject lands are envisaged.	

Table 14-5: Hydrology and Hydrogeology

Hydrology and Hydrogeology	
Summary	
Chapter 7 of this EIAR, Hydrology and Hydrogeology, provides an assessment of the potential direct and indirect impacts of the Proposed Development on hydrology, water and hydrogeology and sets out any required mitigation measures where appropriate.	
Interactions	
Population and Human Health	<p>No public health issues associated with the water (hydrology and hydrogeology) conditions at the Proposed Development Site have been identified for the Construction Phase or Operational Phase of the Proposed Development.</p> <p>Appropriate industry standards and health and safety legislative requirements will be implemented during the construction phase that will be protective of site workers.</p> <p>It is noted that specific issues relating to Public Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.</p>
Land and Soils	An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment during the Operational Phase of the Proposed Development is set out in Chapter 6 Land, Soil and Geology.
Traffic	Any possibility of cumulative impacts on water courses at off-site locations in the immediate vicinity of the Site (i.e. The Naniken Stream and Tolka Estuary), due to sediment that may be entrained in road runoff due to Traffic activities and resulting tracked sediment and debris being tracked offsite during the Construction Phase of the Proposed Development are addressed in Section 7.5.3.2 in this Chapter. The Proposed Development will have no significant impact on overall traffic volumes at the Proposed Development Site during the Operational Phase and therefore traffic will not result in any significant impacts on water quality or quantity at sensitive water body receptors. Any specific issues relating to Traffic impacts associated with the Proposed Development are set out in Chapter 12 of this EIAR.
Biodiversity	<p>The Proposed Development will potentially impact ecological receptors via surface water runoff to road gullies and sewers and groundwater migration.</p> <p>An assessment of the potential impacts of the Proposed Development on the Biodiversity of the Proposed Development Site, with emphasis on habitats, flora and fauna which may be impacted as a result of the Proposed Development is included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and</p>

	<p>species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.</p>
Material Assets: Waste and Utilities	<p>Any discharges to the public foul sewer and abstractions from water supply from the Proposed Development will be under consent from Irish Water. An assessment of the potential impact of the Proposed Development on the Material Assets including built services, infrastructure, traffic, and waste management has been set out in Chapter 12 of this EIAR.</p>
Conclusions	
<p>Overall, provided the mitigation measures outlined in the respective Chapters outlined above, there will be no significant adverse impacts on the receiving hydrological and hydrogeological environment associated with the Construction Phase of the Proposed Development.</p>	

Table 14-6: Air Quality and Climate

Air Quality and Climate	
Summary	
<p>Chapter 8 of this EIAR, Air Quality and Climate, provides an assessment of the potential impacts from the Proposed Development on ambient air quality and climate, and sets out appropriate mitigation measures where necessary.</p> <p>There is the potential for combustion emissions from onsite machinery and traffic derived pollutants of CO₂ and N₂O to be emitted during the construction phase of the development. However, due to the size and duration of the construction phase, and the mitigation measures proposed, the effect on national GHG emissions will be insignificant in terms of Ireland's obligations under the Kyoto Protocol and therefore will have no considerable impact on climate. Overall, climatic impacts are considered to be short-term and imperceptible.</p> <p>The CFD study carried out for the Proposed Development has shown that under the assumed wind conditions typically occurring within Dublin for the past 30 years, the development is designed to be a high-quality environment for the scope of use intended for each area/building (i.e., comfortable and pleasant for potential pedestrians).</p> <p>A Flood Risk Assessment (FRA) was undertaken for the Proposed Development and concluded that as a result of the proposed mitigation measures, the residual risk of flooding from any source is low.</p> <p>Increased LDV and HGV traffic flow as a result of the Proposed Development is likely to contribute to increases in GHG emissions such as CO₂ and N₂O. However, these contributions are likely to be marginal in terms of overall national GHG emission estimates and Ireland's obligations under the Kyoto Protocol, and therefore unlikely to have an adverse effect on climate.</p> <p>The Energy Analysis Report has determined that through a number of energy and servicing strategies, an A2/A3 BER should be attainable.</p>	
Interactions	
Population and Human Health	<p>Interactions between Air Quality and Population and Human Health have been considered as the Operational Phase has the potential to cause health issues as a result of impacts on air quality from dust nuisances and potential traffic derived pollutants. However, the mitigation measures employed at the Proposed Development will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected. Furthermore, traffic-related pollutants have been assessed and determined as negligible, therefore air quality impacts from the Proposed Development are not expected to have a significant impact on population and human health.</p>
Land and Soil	<p>There is the potential for dust from soil spillages on the existing road network around the site to impact air quality, especially during dry conditions. However, dampening down measures with water sprays will be implemented during period of dry weather to reduce dust levels arising from</p>

	<p>the development works. Therefore, the impact of the interaction between air quality and climate and biodiversity is insignificant.</p>
<p>Traffic</p>	<p>There can be a significant interaction between air quality, climate and traffic. This is due to traffic-related pollutants that may arise. In the current assessment, traffic derived pollutants which may affect Air Quality and Climate have been deemed as negligible. Therefore, the impact of the interaction between air quality and climate is insignificant.</p>
<p>Biodiversity</p>	<p>Designated sites of ecological conservation importance within 200m of the Affected Road Network (ARN) are required to be included in the air quality assessment. This includes special protection areas, special areas of conservation, natural heritage areas, and nature reserves. Only sites that are sensitive to nitrogen deposition should be included in the assessment, it is not necessary to include sites such as those which have been designated as a geological feature or water course. No Sites of ecological conservation importance have been identified within 200m of the ARN; therefore, this analysis has been excluded in the current assessment and significant effects are not expected to occur. Therefore, the impact of the interaction between air quality and climate and biodiversity is insignificant.</p>
<p>Conclusions</p>	
<p>It is not expected that adverse air quality impacts are likely to occur at sensitive receptors as a result of the Proposed Development. However, appropriate mitigation measures, as outlined within the Preliminary Construction, Demolition and Waste Management Plan (CDWMP) and Construction Environmental Management Plan (CEMP), will be employed as necessary to further prevent such impacts occurring.</p> <p>The Proposed Development is likely to result in a long-term increase in traffic on the roads surrounding the Proposed Development Site; however, this increase in traffic has been determined to have negligible impacts in terms of local air quality. Furthermore, the increase in traffic has been determined as marginal with regard to climatic impacts. Therefore, no adverse residual impacts are anticipated from the proposed scheme in the context of air quality and climate.</p>	

Table 14-7: Noise and Vibration

Noise and Vibration	
Summary	
<p>Chapter 9 of this EIAR, Noise and Vibration, provides a description and assessment of the likely impact of the proposed activities from noise, and sets out appropriate mitigation measures where necessary.</p> <p>The noise-generating activities associated with the current Site are as follows:</p> <ul style="list-style-type: none"> • Site clearance, including demolition works of the pre-fab building within the grounds; • Building construction works; • Trucks entering and exiting the Site. 	
Interactions	
Population and Human Health	<p>The impact assessment of noise and vibration has concluded that additional noise associated with the operation of on-site machinery will be intermittent and will not create any major negative impacts beyond the Site boundary. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the Proposed Development.</p> <p>It is noted that specific issues relating to Population and Human Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.</p>
Biodiversity	<p>Interactions between noise and vibration and biodiversity have been considered as the Proposed Development has the potential to cause short-term impacts on biodiversity as a result of noise and vibration in the absence of mitigation measures. However, the mitigation measures employed at the Proposed Development will ensure that biodiversity will not be affected. An assessment of the potential impact of the Proposed Development on biodiversity is included in Chapter 5 of this EIAR.</p>
Land and Soil	<p>Soil excavation works will cause an increase in noise; however, it has been determined within Chapter 9 of this EIAR that this increase in noise will be intermittent and insignificant.</p>
Traffic	<p>The Proposed Development will have no significant impact on overall traffic volumes and therefore traffic will not result in any significant increases of noise at sensitive receptors.</p>
Conclusions	
<p>No traffic routes are predicted to experience increases of more than 25% in total traffic flows during the Operational Phase and therefore no detailed assessment is required as per the DMRB Guidelines. The impact of noise from operational traffic will be unnoticeable and will not have a negative impact.</p>	

The noise assessment has concluded that significant impacts of noise and vibrations are not expected to occur and any potential interactions with impacts of other environmental aspects, as outlined in this EIAR, are insignificant.

Table 14-8: Landscape and Visual

Landscape and Visual Assessment	
Summary	
<p>Chapter 10 of the EIAR, Landscape and Visual Assessment, provides a description and assessment of the likely impact of the Proposed Development on the landscape and visual amenities of the area.</p> <p>The main interactions with the townscape and visual impact assessment include, Architectural Design, Landscape Design, Archaeology and Cultural Heritage, Planning and Biodiversity</p>	
Interactions	
Archaeology and Cultural Heritage	<p>As there are no known archaeological or architectural remains found during the desk top survey as well as the walkover survey, it is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.</p>
Population and Human Health	<p>The Proposed Development will alter the visual appearance of the Site which is predominantly a greenfield Site. It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the Site of the Proposed Development and the rural and residential nature of the surrounding landscape, will cause any significant impacts for the residential local population.</p>
Biodiversity	<p>The landscaping proposed for the Site entails the planting of over 700 trees, many of which are native species. This increase in tree cover across the Site will provide additional nesting/foraging resources for local passerines, along with a slight increase in habitat connectivity over what is currently open field habitat.</p>
Conclusions	
<p>Subject to implementation of all mitigation measures detailed in Chapter 10, there will be no negative residual impacts upon the landscape and visual resources.</p>	

Table 14-9: Archaeology and Cultural Heritage

Archaeology and Cultural Heritage	
Summary	
<p>Chapter 11 of the EIAR, Archaeology and Cultural Heritage, provides information on the known architectural, archaeological and cultural heritage sites in the study area in relation to Proposed Development.</p> <p>Subject to implementation of mitigation measures, there will be no negative residual impacts upon the archaeological or cultural heritage resource.</p>	
Interactions	
Landscape and Visual	<p>It is not predicted that any changes in landscape or visual amenities will affect in any way the archaeology and cultural heritage of the area.</p>
Conclusions	
<p>Subject to implementation of mitigation measures detailed in Chapter 11, there will be no negative residual impacts upon the archaeological or cultural heritage resource.</p>	

Table 14-10: Material Assets - Traffic, Waste and Utilities

Material Assets - Traffic, Waste and Utilities	
Summary	
Chapter 12 of the EIAR, Material Assets, provides an assessment of the potential impacts of the Proposed Development on Material Assets including traffic, built services and infrastructure.	
Interactions – Traffic	
Air Quality	In the current assessment, traffic derived pollutants which may affect Air Quality and Climate have been deemed as negligible. Therefore, the impact of the interaction between air quality and climate is insignificant.
Noise	It has been concluded as part of the noise and vibration assessment that operational traffic will not result in adverse impacts on sensitive receptors in terms of noise.
Population and Human Health	Construction activities will result in an increased number of HGV movements during the Construction Phase. The Proposed Development will also result in an increase in the population of the surrounding area and subsequently an increase in the number of vehicles. There is potential for significant impacts on population and human health in relation to the capacity and operation of the surrounding road network. No traffic routes are predicted to experience increases of more than 25% in total traffic flows during the Operational Phase. The overall impact of the Proposed Development on the transportation infrastructure in the local area will be minimal.
Land and Soil	Excess soil excavated during construction works for the development will be transported by road for disposal in approved locations as provided for in this EIAR. Movements of construction traffic will be managed in accordance with the Construction Traffic Management Plan.
Waste and Utilities	Waste collection activities at the Proposed Development have the potential to impact upon traffic movements in the Raheny and Clontarf areas. Potential impacts on traffic are addressed in Chapter 12.1 of this EIAR.
Interactions – Waste & Utilities	
Land and Soils	Improper handling and segregation of hazardous or contaminated wastes could lead to the contamination of soil and stones excavated from the site. Potential impacts on land and soils are addressed in Chapter 6 of this EIAR.
Hydrology and Hydrogeology	Any connections to the public water network (water supply or foul sewer) during the Construction and Operational Phases will be under consent from Irish Water. Potential impacts on water are addressed in Chapter 7 of this EIAR.

Population and Human Health	The improper removal, handling and storage of waste could negatively impact on the health of construction workers. Extended power or telecommunications outages, or disruption to water supply or sewerage systems for existing properties in the area could negatively impact on the surrounding human population and their overall health. Potential impacts on population and human health are addressed in Chapter 4 of this EIAR.
Biodiversity	The improper handling and storage of waste during the Construction and Operational Phases could negatively impact on biodiversity. Potential impacts on biodiversity are addressed in Chapter 5 (Biodiversity) of this EIAR.
Traffic	Waste collection activities at the Proposed Development have the potential to impact upon traffic movements in the Raheny and Clontarf areas. Potential impacts on traffic are addressed in Chapter 12.1 of this EIAR.
Conclusions	
<p>A Preliminary Construction and Demolition Waste Management Plan (CDWMP), which is submitted as a separate document with this planning application, sets out that all waste generated during the Construction Phase will be segregated onsite to enable ease in re-use and recycling, wherever appropriate.</p> <p>Due to the use of permitted/licensed waste collection/waste management facilities, it is not predicted that the production of waste will cause any likely significant effects on the environment. It is the responsibility of the Main Contractor to ensure that waste collection contractors are legally permitted to carry the waste, and that the facility they bring the waste to is licensed to handle that type of waste as outlined in the Waste Management Act 1996 as amended.</p>	

14.4 References

EIAR Chapters 4 to 12 inclusive.

15 MITIGATION AND MONITORING MEASURES

15.1 Introduction

This EIAR has assessed the impacts and resulting effects likely to occur as a result of the Proposed Development on the various aspects of the receiving environment.

The Proposed Development will be operated in a manner that will ensure that the potential impacts on the receiving environment are avoided where possible. In cases where impacts or potential impacts have been identified, mitigation measures have been proposed to reduce the significance of particular impacts. These mitigation recommendations are contained within each chapter exploring specific environmental aspects.

This chapter of the EIAR collates and summarises the mitigation commitments made in Chapter 4 to Chapter 13.

15.2 Summary of Mitigation Measures

15.2.1 Population and Human Health

15.2.1.1 Construction Phase

15.2.1.1.1 Mitigation

No specific mitigation measures are required during the Construction Phase of the Proposed Development in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, mitigation measures in relation to air emissions (dust), noise, traffic, waste etc. are identified in their respective chapters in this EIA Report.

15.2.1.1.2 Monitoring

No specific monitoring measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, monitoring in relation to noise and traffic are identified in their respective chapters in this EIA Report.

15.2.1.2 Operational Phase

15.2.1.2.1 Mitigation

No specific mitigation measures are required during the Operational Phase of the Proposed Development in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, mitigation measures in relation to air emissions, noise, traffic, waste etc. are identified in their respective chapters in this EIA Report.

15.2.1.2.2 Monitoring

No specific monitoring measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, monitoring in relation to noise and traffic are identified in their respective chapters in this EIA Report.

15.2.2 Biodiversity

15.2.2.1 Mitigation Measures

15.2.2.1.1 Mitigation 1: Controlled Vegetation Removal

Hedgehog

During the Construction Phase of the Proposed Development Hedgehogs in particular have the potential to be significantly impacted through the loss of suitable hibernation and nest sites in the form of piles of dead wood, vegetation and leaves on site.

This can be mitigated through the careful removal of dead wood/leaves to another part of the site where they will not be affected. Woody debris from the proposed management of hedgerow/treeline areas on site should also be left in this out-of-the way area as compensatory hedgehog habitat during the Construction Phase.

Work likely to cause disturbance during hibernation – for example removal of hibernation habitats such as log piles and dense scrub/hedgerow – should not take place during Winter i.e., 1st November to 1st March, but also must take into account the breeding bird season (1st March to 31st August.) in order to avoid potential nest destruction and bird mortality.

As such, it is recommended that any removal of trees or scrub be carried out in **September/October** in order to ensure the best biodiversity outcome and to comply with the Wildlife Acts 1976 and Amendments.

Nesting birds

The removal of trees and scrub will be completed outside the main bird nesting season where possible, i.e., **1st March to 31st August**. Should removal within this period be unavoidable, a suitably qualified Ecologist will be instructed to survey the affected vegetation prior to removal. Should any active nests and/or eggs be present, the section of vegetation containing them will be noted and fenced off and protected until the young birds have fledged and left the nest or, where possible, the end of the nesting season. Fledging will be confirmed by the Ecologist through further surveys. Once this has been confirmed the nest can be removed and the vegetation cleared under the supervision of the Ecologist. Please note that active nests will require a buffer zone to limit the disturbance of works in their vicinity. This will be agreed in consultation with the Ecologist.

15.2.2.1.2 Mitigation 2: Badgers

Transport Infrastructure Ireland's (TII, previously the NRA) *Guidelines for the treatment of badgers prior to the construction of national road schemes*, will be consulted in terms of the management of potential badger setts at the Site of the Proposed Development. The following measures are taken from this guidance document and the Badger Assessment Report prepared by Brian Keeley (2022) (See Appendix E) and adapted to apply to the Proposed Development.

Prior to the commencement of any construction works, a pre-construction badger survey will be carried out by a suitably qualified Badger specialist; to establish the current status of the badger setts (main and annexe setts) located in the north-western corner of the Site.

As badgers are known to inhabit the Site and surrounding lands, a Construction Phase Badger Management Plan will be prepared by the Badger specialist, to be approved by the NPWS prior to any works commencing on site. This document will detail any protection zones required to ensure the works do not undermine the setts or their tunnels, and the mitigation measures that will be required to protect badger for the extent of the Construction Phase e.g., no works buffer zone, badger-proof fencing to prevent access to the Site during works etc.

Works close to badger setts will only be conducted under the supervision of the badger specialist under licence from the NPWS. During the breeding season (December to July inclusive), no works should be undertaken within 50m of active setts nor blasting or pile driving within 150m of active setts.

Badger sett tunnel systems can extend up to ca. 20m from sett entrances. As there is the possibility that tunnels would be destroyed by movement of heavy plant over the ground above them, it is essential that no heavy plant cross within 30 metres of a sett entrance (where there is potential for chambers or tunnels beyond this, a 50 metre distance should be observed). This will ensure that setts are not damaged and that badgers are not inadvertently crushed during construction. Lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance will not take place within 10m of sett entrances unless under the supervision of the badger specialist.

15.2.2.2 Sett removal

The retention of the setts in-situ is unfeasible due to spatial constraints and the footprint of the Proposed Development. As such, a suitably qualified Badger specialist will be instructed to prepare an exclusion plan for the decommissioning of the setts and their destruction once all badgers have been confirmed to have vacated. The objective is to allow the badgers to remain within their territory, even though a portion of their current territory will be lost as a result of the Proposed Development. The provision of an artificial sett within the Site of the Proposed Development will also be incorporated into the landscape plan as detailed below.

The existing setts will not be excluded or destroyed until the artificial replacement sett has been constructed.

Exclusion of badgers from the setts

Exclusion of badgers from the setts should only be carried out during the period of **August to November (inclusive)** in order to avoid the badger breeding season.

As per the TII guidance, the removal of badgers from affected setts and subsequent destruction of these setts will only be conducted with NPWS permission/approval, and by experienced badger specialists. The exclusion process will include monitoring to ensure that badgers have fully evacuated the setts prior to their destruction. The NPWS grant permission/approval to the experts undertaking the badger operations and not to the developer or contractor. A badger sett exclusion plan and method statement will be prepared by the badger specialist and provided to the NPWS prior to commencement for their approval. No works will take place without the supervision of the Badger specialist.

Measures to ensure the sett has been vacated and is devoid of all badgers will be designed by the Badger specialist, involving a combination of:

- one-way badger gates on active entrances,

- badger proof fencing,
- soft and hard blocking of inactive entrances, and
- recurring inspections.

Gates will be left installed, with regular inspections, over a minimum period of 21 days before the sett is deemed inactive. Any badger activity at all will require the procedures to be repeated or additional measures taken. Sett destruction should commence immediately following the 21 day exclusion period, provided that all badgers have been excluded. Should a badger be discovered during this operation, the NPWS will be advised immediately and all excavation will cease until it is agreed with NPWS that it may continue.

No exclusion will commence in advance of the completion of the artificial sett.

All setts should be assessed on a case by case basis by a suitably experienced badger expert, with measures adapted to suit the situation as per the expert's direction.

Sett destruction

The destruction of a successfully evacuated badger sett may only be conducted under the supervision of qualified and experienced personnel with approval/permission from the NPWS. The possibility of badgers remaining within a sett must always be considered; suitable equipment should be available on hand to deal with badgers within the sett or any badgers injured during sett destruction.

TII Guidelines recommend that sett destruction is usually undertaken with a tracked 12-25 ton digger, commencing at ca. 25m from the outer sett entrances and working towards the centre of the sett, cutting ca. 0.5m slices in a trench to a depth of 2m. Exposed tunnels may be checked for recent badger activity with full attention paid to safety requirements in so doing.

A report detailing the evacuation procedures, sett excavation and destruction, and any other relevant issues will be prepared by the badger specialist and submitted to the NPWS.

Artificial sett provision

An artificial main sett will be provided within the north-eastern corner of the Site as compensation for the loss of the existing main sett. The possibility of installing an artificial sett elsewhere in the park as compensation was also considered and is a viable alternative, however, the installation of the new sett within a suitable location at the Site is the preferred option.

The new sett location will be located in the north-eastern corner of the Site, approx. 230m east of the existing main sett and linked by the existing woodland corridor present along the Site's northern and eastern boundaries (See Figure 15-2). The new sett will be constructed and established before the badgers are excluded from the existing setts and they are destroyed.

The artificial sett will be accessed by six entrances and will require a minimum of six chambers to accommodate a breeding group of badgers. The badger specialist recommends an area of 15m x 15m for the sett. A dense section of scrub vegetation (e.g., Gorse, Brambles, Elder, Hawthorn, Blackthorn) will be planted within the designated artificial sett area; the goal being to connect the site with the woodland margin along the Site's eastern boundary and provide connectivity with the rest of the park for the badgers to forage as before, to provide shelter

and protection for the sett and minimise human related disturbance from the Proposed Development; thus maximising the setts chances of being adopted.

All lighting will avoid illumination of the setts or any alternative setts installed within the Site.

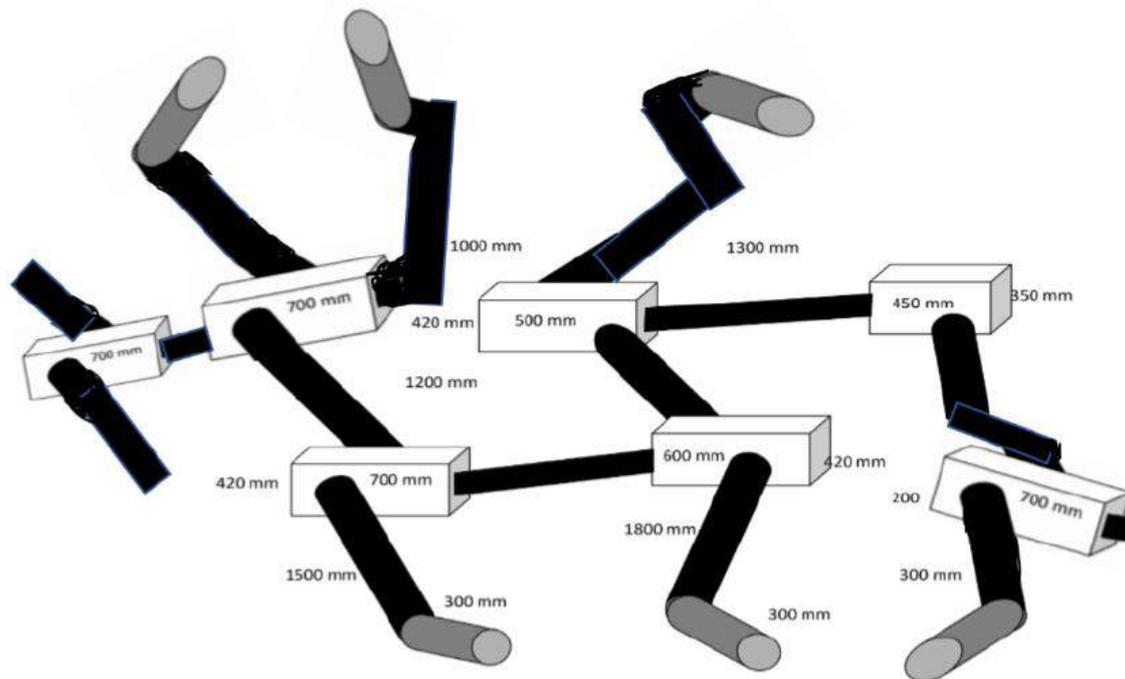


Figure 15-1. Schematic representation of an artificial sett design with 7 chambers and 6 entrances. Three open tunnels would allow expansion of the sett following occupation. Extracted from Badger Assessment Report (Keeley, 2022).



Figure 15-2. Image showing the location of the proposed artificial sett area within the north-eastern corner of the Site (Orange area).

Construction of the artificial sett must not place existing setts in danger. All construction equipment must remain a minimum of 30 metres (up to 50 metres where there is potential for chambers or tunnels) from all existing (naturally constructed) sett entrances during the creation of the new sett.

Artificial setts will be constructed several months in advance of the closure of a breeding sett. In this interval, the affected badgers should be encouraged to utilise the artificial sett by means of attractive food baits (peanuts etc.) and materials from the breeding sett added to the new sett (such as bedding and spoil). The construction of an effective artificial sett is an exercise best conducted by experienced personnel. The constructed tunnels and chamber system will be located in well-drained soils and be landscaped and planted to ensure adequate cover and lack of disturbance.

Recommending monitoring of badger activity is discussed in section 5.9.

Disturbance limitation

In order to minimise the potential for human and dog related disturbance of the new sett area and its surrounding vegetation, access to this portion of the site will be restricted and discouraged through landscaping (e.g., fencing, dense planting) and signage (e.g., 'Dogs to be kept on leads to protect wildlife').

15.2.2.2.1 Mitigation 3: Bat-friendly Tree Felling

Prior to the demolition of any site structure, and/ or the felling of any mature trees within the Site, it is required that a roost inspection survey is carried out at the appropriate time of year by a suitably qualified ecologist in order to determine the presence of any potential roosts.

Any potential bat roost trees, i.e., in particular those located within the north-western section of the subject lands, will be surveyed by a suitably qualified bat ecologist for bat emergence/activity **during the dusk and dawn immediately prior to felling**. If no bats are found to be roosting within these trees, then they will be section-felled under the supervision of an experienced ecologist/bat specialist.

Felling will take place, where possible, during the months of **September and October**, to avoid both the nesting bird season and the hibernation period for bats; in which roosting bats are most at risk of death or injury during tree felling.

Tree-felling will be undertaken using heavy plant and chainsaw. There is a wide range of machinery available with the weight and stability to safely fell a tree. Normally trees are pushed over, with a need to excavate and sever roots in some cases. In order to ensure the optimum warning for any roosting bats that may still be present, the tree should be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. Any affected trees should then be pushed to the ground slowly and should remain in place for a period of at least 24 hours, and preferably 48 hours to allow bats to escape.

Trees felled will not **under any circumstances** be cut up or mulched immediately after felling in case protected wildlife is present.

15.2.2.2.2 Mitigation 4: Bat-friendly Lighting

The impact of increased night-time lighting as a result of the Proposed Development will be mitigated through the incorporation of bat-friendly lighting measures into the project design and the lighting plan.

In order to minimise disturbance to bats commuting/foraging in the vicinity of the Site, lighting will be designed to minimise light-spill onto any hedgerows or treelines to be retained at the Site. This can be achieved by ensuring that the design of lighting adheres to the guidelines presented in the Bat Conservation Trust & Institute of Lighting Engineers '*Bats and Lighting in the UK - Bats and Built Environment Series*', (ILP, 2018) the Bat Conservation Trust '*Artificial Lighting and Wildlife Interim Guidance*' and the Bat Conservation Trust '*Statement on the impact and design of artificial light on bats*'. Therefore, the lighting scheme will include the following:

- The minimisation of night-time lighting emitted during both the Construction and Operational Phases of the Proposed Development (once health and safety requirements are met).
- The avoidance of direct lighting of treelines and hedgerows at the Site, as well as areas of planting.
- Unnecessary light spill controlled through a combination of directional lighting and hooded / shielded luminaires.

- Where appropriate, luminaires on the site boundary will be fitted with light baffles to prevent light spill onto adjacent habitats.
- Areas around the perimeter should not be lit up nor lighting directed towards them. Lighting in these areas should not increase beyond existing night-time lux levels or 1 lux, whichever is the lesser.
- Movement sensor triggered lighting and low level bollards will be considered for paths around the perimeter of the Proposed Development, particularly areas of proposed tree planting.
- Vertical light spill at light sources will be below 3m to avoid potential bat flight paths.
- No floodlighting will be used – this causes a large amount of light spillage into the sky significantly impacting bats. The spread of light should be kept below the horizontal.
- Hoods, louvres, shields or cowls should be fitted on the lights to reduce light spillage.
- Lights will be of low intensity. It is better to use several low intensity lights than one strong light spilling light across the entire area.
- Narrow spectrum lighting should be used with a low UV component. Glass also helps reduce the UV component emitted by lights.
- The source of light will be Light Emitting Diodes (LEDs) as this is a narrow beam that is highly directional and a highly energy efficient light source.

Incorporation of the appropriate luminaire specifications as advised by a lighting professional can have a considerable input in mitigating the potential impact of night-time lighting on local bats.

Night-time lighting across the Site of the Proposed Development should be kept to a minimum during both the Construction and Operational Phases of the Proposed Development through the reduction of light spill from the building interior via windows/entrances, and the reduction of spill/glare from outdoor lighting in place on the building exterior and throughout the Site (see Figure 15-3).

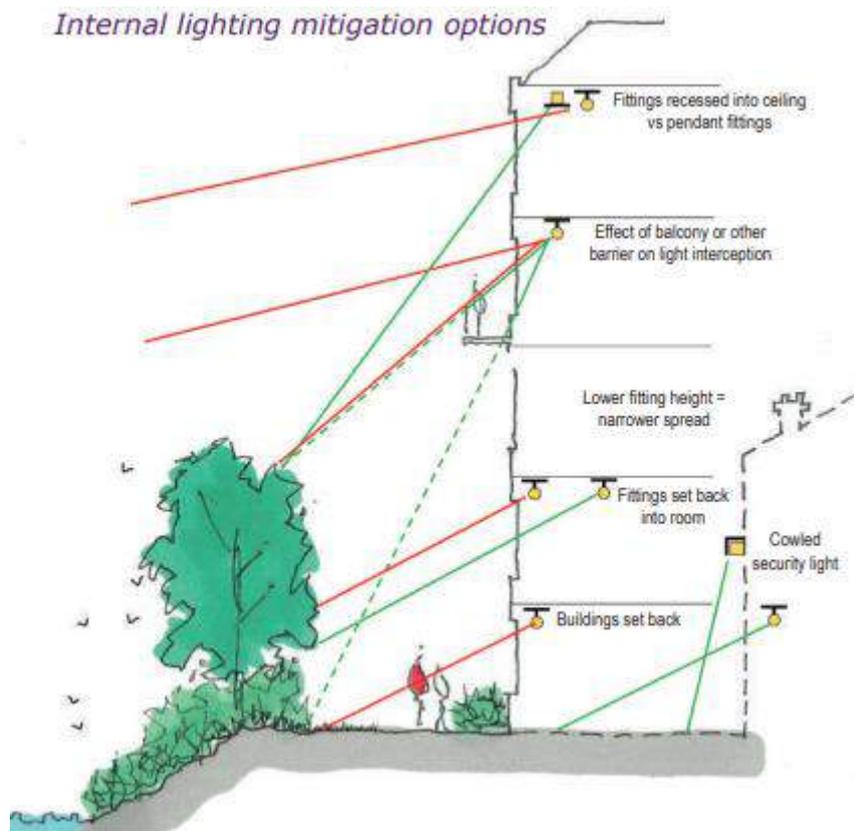


Figure 15-3. Internal Lighting Guidance Diagram adapted from ILP (2018).

It is noted that bat-friendly lighting measures as detailed above will have a similar positive effect with regard to commuting bird species flying at night. Further measures are outlined in 'Best Practices for Effective Lighting' (City of Toronto, 2017).

15.2.2.2.3 Mitigation 5: Habitat Protection

There is a potential impact on identified habitats locally and associated fauna, as a result of surface water run-off containing silt, oil or other pollutants into the drainage ditch adjacent to the Proposed Development, with a potential connection with the Naniken Stream (100m north of the Proposed Development) which eventually flows into North Bull Island's south lagoon.

The CEMP will be implemented by the appointed Contractor that details the suitable precautions to be followed in relation to any potential pollution of watercourses from construction activities. The storage of materials, containers, stockpiles and waste, however temporary, must follow best practice at all times and be stored at designated areas away from watercourses.

The *Engineering Assessment Report* submitted with this planning application, details the comprehensive Sustainable Drainage System (SUDS) that is to be incorporated into the Proposed Development. Similarly, the *Arboriculture Report* completed by The Tree File Consulting Arborists, details the tree protection measures that will be implemented in order to protect trees that are to be retained as part of the Proposed Development.

15.2.2.2.4 Mitigation 6: Naniken Stream and European Eel

15.2.2.2.4.1 Construction Phase

The following is proposed to ensure that no potential adverse effects will arise from construction-related surface water discharges from the Proposed Development. All works adjacent to the Naniken River will be carried out in accordance with Inland Fisheries Ireland (IFI), “*Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*”. Contact will be made with IFI to ensure the works comply with the provisions of the Fisheries Act and Habitats Regulations, and in accordance with any detailed operational and construction requirements issued by IFI.

Best practise Construction measures for works within, or in the vicinity of watercourses will also be followed as per ‘*Guidelines for the crossing of watercourses during the construction of national road schemes*’ (TII, 2008) and ‘*Control of water pollution from linear construction projects - CIRIA C648*’ (CIRIA, 2006). The below measures will be included in the CEMP to prevent the release of hydrocarbons, polluting chemicals, sediment/silt and contaminated waters into the receiving surface water network:

- A suitably qualified Ecological Clerk of Works (ECoW) will be present on-site during the works being undertaken along the Naniken river bank i.e., the installation of the surface water outfall.
- Specific measures to prevent the release of sediment over baseline conditions to the Naniken River (and subsequently the Tolka Estuary) and Dublin Bay during the construction work, which will be implemented as the need arises. These measures include, but are not limited to, the use of silt traps, silt fences, silt curtains, settlement ponds and filter materials. This is particularly important when undertaking any works/upgrading to the surface and foul water drainage networks at the site of the Proposed Development.
- It will be ensured that all river protection measures will be **maintained in good and effective condition** for the duration of the proposed works and checked regularly to ensure that the silt fencing and other mitigation measures are operating effectively. Daily checks may be appropriate during the initial site clearance, during works in the vicinity of the watercourse, and during and after storm events. Weekly or bi-weekly checks may be appropriate at other times.
- Provision of exclusion zones and barriers such as silt fences between earthworks, stockpiles and temporary surfaces to prevent sediment washing into the Naniken River and/or existing drainage systems and hence the downstream receiving water environment.
- Silt traps will not be constructed immediately adjacent to the Naniken River, i.e. a buffer zone between the trap and the watercourse with natural vegetation must be left intact. Imported materials such as terram, straw bales, coarse to fine gravel should be used either separately or in-combination as appropriate to remove suspended matter from discharges.
- Provision of temporary construction surface drainage and sediment control measures will be in place before the construction of the pipeline and/or earthworks commence.

- Weather conditions will be taken into account when planning construction activities to minimise risk of run-off from the Site.
- Prevailing weather and environmental conditions will be taken into account prior to the pouring of cementitious materials for the works adjacent to the Naniken Stream and/or surface water drainage features, or drainage features connected to same. Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete will not be discharged to the Naniken Stream or existing surface water drainage systems. Concrete washout areas will be located remote from the Naniken Stream or any surface water drainage features, where feasible, to avoid accidental discharge to watercourses.
- Any fuels or chemicals (including hydrocarbons or any polluting chemicals) will be stored in a bunded area to prevent any seepage of into the Naniken Stream, local surface water network or groundwater, and care and attention taken during refuelling and maintenance operations.
- Temporary oil interceptor facilities will be installed and maintained where site works involve the discharge of drainage water to receiving rivers and streams.
- All containment and treatment facilities are regularly inspected and maintained.
- All mobile fuel bowsers will carry a spill kit and operatives must have spill response training.
- All fuel containing equipment such as portable generators will be placed on drip trays. All fuels and chemicals required to be stored on-site will be clearly marked.
- Implementation of response measures to potential pollution incidents.
- Emergency procedures and spillage kits will be available and construction staff will be familiar with emergency procedures in the event of accidental fuel spillages.
- All trucks will have a built-on tarpaulin that will cover excavated material as it is being hauled off-site and wheel wash facilities will be provided at all site egress points.
- Water supplies will be recycled for use in the wheel wash. All waters will be drained through appropriate filter material prior to discharge from the construction sites.
- The removal of any made ground material, which may be contaminated, from the construction site and transportation to an appropriate licenced facility will be carried out in accordance with the Waste Management Act, best practice and guidelines for same.
- A discovery procedure for contaminated material will be prepared and adopted by the appointed contractor prior to excavation works commencing on site. These documents will detail how potentially contaminated material will be dealt with during the excavation phase.
- Implementation of measures to minimise waste and ensure correct handling, storage and disposal of waste (most notably wet concrete, pile arisings and asphalt).

15.2.2.2.4.2 Operational Phase

With regard to the proposed discharge of treated operational surface water from the Proposed Development to the Naniken River, the potential for surface water generated at the Site of the

Proposed Development to cause significant effects to downstream sensitivities during the Operational Phase would be considered negligible due in part to the SUDS measures incorporated in the Project Design. Project specific SUDS measures are described below.

The following attenuation and SUDS measures will be incorporated into the Proposed Development as detailed in the Engineering Assessment Report (Waterman Moylan, 2021):

- Permeable paving
- Filter drains throughout Site
- Extensive green roofs on the buildings
- Tree pits located throughout the Site
- Underground attenuation tank
- Flow control device (Hydrobrake or similar) and
- Class 1 Bypass petrol interceptor located prior to outfall to Naniken River.

15.2.2.2.5 Mitigation 7: Noise Management

A number of measures will be included in the final CEMP as set out in *BS 5228-1: A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*, that will be put in place during the Construction Phase of the Proposed Development. These will ensure that the level of noise caused by the proposed works will be controlled/reduced where possible so as to minimise the potential disturbance impact on local fauna species.

These measures will include but are not limited to:

- Selection of plant with low inherent potential for generating noise.
- Avoid unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Where noise becomes a source of resonating body panels and cover plates, additional stiffening ribs or materials should be safely applied where appropriate.
- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Appointing a site representative responsible for matters relating to noise.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

These measures will ensure that any noise disturbance to local birds or any other fauna species in the vicinity of the Site of the Proposed Development will be reduced to a minimum.

15.2.2.2.6 Mitigation 8: Reduction of Construction hazards

All construction waste with the potential to harm small mammals e.g., plastic sheeting, netting/mesh will be kept above ground; to reduce the risks to small mammal of suffocation/ entrapment.

To prevent mammals becoming trapped in excavations during the Construction Phase, a means of escape e.g., ramps, or objects such as planks will be placed in pits overnight.

15.2.2.3 Monitoring

15.2.2.3.1 Construction Phase

15.2.2.3.1.1 Bats

As a precautionary measure, it is recommended that the relevant potential bat roost trees, located within the north-western section of the subject lands, are section-felled under the supervision of an experienced ecologist. If bats are present, all works must cease, and NPWS contacted in order to obtain a derogation licence. The CEMP submitted with this planning application provides for a Project Environmental Consultant who will supervise or appoint a suitably qualified person to supervise any work that has potential to involve risk to the environment.

15.2.2.3.1.2 Surface water protection measures

The applicant will ensure that monitoring during the Construction Phase will be carried out by a suitably qualified person. This person will specifically ensure that mitigation measures set out in this report are fully implemented, particularly in relation to the protection of the Naniken Stream (i.e., silt fencing condition and supervision of works in or near the stream).

Surface water protection measures e.g., silt fences etc., will be monitored for their effectiveness for the duration of the works. Daily checks may be appropriate during the initial site clearance, during works in the vicinity of the watercourse, and during and after storm events. Weekly or bi-weekly checks may be appropriate at other times.

15.2.2.3.2 Operational Phase

15.2.2.3.2.1 Badger monitoring programme

Construction Phase

A suitably qualified Badger specialist will be employed prior to the commencement of works on site to survey the Site for badger activity and assess the status of the existing setts.

The specialist will be employed for the duration of the construction Phase and will supervise all works in the vicinity of the existing setts and the artificial sett once constructed. The construction of the artificial sett will also be carried out under the supervision of this specialist in consultation with NPWS.

The specialist will ensure no harm come to badgers during the Construction Phase e.g., exclusion fencing to prevent access to the construction site as required.

A schedule of checks will be drawn up by the specialist to cover the duration of the Construction Phase; to ensure that badger protection measures are in place and working effectively.

Post Construction

A post-construction monitoring programme is proposed for the Site to assess the success (or not) of the mitigation measures relating to badgers. The post construction monitoring will entail the assessment of badger activity at the Site post construction, and the assessment of the success of the artificial sett.

On completion of all works, an inspection of the artificial sett will be carried out to ensure it is accessible and in good repair. It is proposed that inspections be carried out six months and one year after the date of this initial inspection, using camera traps to determine whether the sett is being used and proposing any further remedial measures if relevant. All inspections, monitoring and license applications will be conducted by suitably qualified badger specialist, with reporting to the relevant authorities.

15.2.2.3.2.2 European Eel and operational surface water monitoring

A monitoring program will be put in place to survey the 'Duck Pond' for European Eel prior to the commencement of works, to establish a baseline of Eel usage of the pond. The pond will be surveyed again once construction has completed, and the Proposed Development is operational. The timing and frequency of this program of surveys will be agreed with Inland Fisheries Ireland and will be carried out by suitably qualified Ecologists with the appropriate licences from the NPWS as required.

The aim of this monitoring program will be to assess whether the operation of the Proposed Development is having an adverse effect on this European Eel population, through comparisons between the baseline survey results and those post development.

15.2.3 Land and Soils

15.2.3.1 Construction Phase

15.2.3.1.1 Mitigation

To reduce the quantity of soil to be removed from or imported into the site, the floor levels of the proposed buildings and roads are designed to match existing levels as closely as is feasible, to minimise the cut and fill balance. The number of vehicle movements offsite will be minimised by this optimisation. However, given that there are two large basements proposed, it is anticipated that there will be a surplus of soil to be removed from the site.

Surplus subsoil and rock that may be required to be removed from site will be deposited in approved fill areas or to an approved waste disposal facility. Surplus subsoil will be stockpiled on site, in such a manner as to avoid contamination with builders' waste materials, etc., and so as to preserve the materials for future use as clean fill. A Preliminary Construction and Demolition Waste Management Plan will include protocols for soil removal and should be implemented by the development's main contractor during the construction stage.

Soil samples taken from the site during the site investigations showed no evidence of contamination. However, any contaminated soils that are encountered during the works will be excavated and disposed of off-site in accordance with the Waste Management Acts, 1998-2006, and associated regulations and guidance provided in Guidelines for the Management of Waste from National Road Construction Projects published by the National Roads Authority in 2008.

In the case of topsoil, careful planning and on-site storage can ensure that this resource is reused on-site as much as possible. Any surplus of soil not reused on site can be sold. However, topsoil is quite sensitive and can be rendered useless if not stored and cared for properly. It is therefore important that topsoil is kept completely separate from all other construction waste, as any cross-contamination of the topsoil can render it useless for reuse.

It is important to ensure that topsoil is protected from all kinds of vehicle damage and kept away from site-track, delivery vehicle turning areas and site plant and vehicle storage areas.

If topsoil is stored in piles of greater than two metres in height, the soil matrix (internal structure) can be damaged beyond repair. It should also be kept as dry as possible and used as soon as possible to reduce any deterioration through lengthy storage and excess moving around the site.

Records of topsoil storage, movements and transfer from site will be kept by the C&D Waste Manager.

The provision of wheel wash facilities at the construction entrance to the development will minimise the amount of soil deposited on the surrounding road network. The adjoining road network will be cleaned on a regular basis, as required, to prevent the build-up of soils from the development site on the existing public roads. Dampening down measures with water sprays will be implemented during periods of dry weather to reduce dust levels arising from the development works.

Measures will be implemented throughout the construction stage to prevent contamination of the soil and adjacent watercourses (in particular the Naniken River) from oil and petrol

leakages. Suitable bunded areas will be installed for oil and petrol storage tanks. Designated fuel filling points will be put in place with appropriate oil and petrol interceptors to provide protection from accidental spills. Refuelling will be restricted to these allocated re-fuelling areas. This area is to be an impermeable bunded area designed to contain 110% of the volume of fuel stored.

During excavation works, temporary sumps will be used to collect any surface water run-off thereby avoiding standing water within the excavations. If groundwater is encountered during excavations, mechanical pumps will be required to remove the groundwater from sumps. Sumps should be carefully located and constructed to ensure that groundwater is efficiently removed from excavations and trenches.

Silt traps, silt fences and tailing ponds will need to be provided by the contractor where necessary to prevent silts and soils being washed away by heavy rains during the course of the construction stage. Surface water runoff and water pumped from the excavation works will be discharged via a silt trap / settlement pond to the existing foul drainage network. Straw bales will be used at the outfall to filter surface water to remove contaminants.

After implementation of the above measures, the Proposed Development will not give rise to any significant long term adverse impact. Moderate negative impacts during the construction stage will be short term only in duration.

A Construction Management Plan, Traffic Management Plan and Construction and Demolition Waste Management Plan will be implemented by the contractor during the construction stage to control the above remedial measures.

15.2.3.1.1 Monitoring

Monitoring during the construction phase is recommended, in particular in relation to the following:

- Adequate protection of topsoil stockpiled for reuse.
- Adequate protection from contamination of soils for removal.
- Monitoring of surface water discharging to existing watercourses, ditches and the Naniken River.
- Monitoring cleanliness of the adjoining road network.
- Monitoring measures for prevention of oil and petrol spillages.
- Dust control by dampening down measures close to the boundaries of the site, when required due to unusually dry weather conditions.

15.2.3.2 Operational Phase

15.2.3.2.1 Mitigation

On completion of the construction phase and following replacement of topsoil, a planting programme will commence to prevent soil erosion. SuDS and filtration devices are proposed to be provided as part of the development. These will help to remove pollutants from rainwater runoff. The SuDS proposals will also encourage infiltration of surface water to the ground.

15.2.3.2.2 Monitoring

During the Operational Phase, the surface water network (drains, gullies, manholes, AJs, SuDS devices, attenuation system) will need to be regularly maintained and cleaned out. A suitable maintenance regime of inspecting and cleaning should be incorporated into the safety file/maintenance manual for the Proposed Development once Operational. A Building Lifecycle Report has been prepared for the Proposed Development by Aramark (2022), which states that rainwater drainage systems installed at the Proposed Development will be cleaned out bi-annually.

15.2.4 Hydrology

These avoidance, remedial and mitigation measures, will ensure that there will be no significant impact on the receiving groundwater and surface water environment. Hence, the Proposed Development will not have any impact on compliance with the EU Water Framework Directive, European Communities (Environmental Objectives) Surface Water Regulations, 2009 (SI 272 of 2009, as amended 2012 (SI No 327 of 2012), and the European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010), as amended 2012 (SI 149 of 2012) and 2016 (S.I. No. 366 of 2016).

15.2.4.1 Mitigation

15.2.4.1.1 Construction Phase

A Construction Environmental Management Plan (CEMP) and Construction and Demolition Waste Management Plan (CDWMP) will be implemented by the contractor to ensure, site-specific procedures and mitigation measures to monitor and control environmental impacts throughout the Construction Phase of the project and ensure that construction activities do not adversely impact the environment. The CEMP and CDWMP will take cognisance of the measures outlined in the EIAR and the Preliminary CDWMP (Waterman Moylan, 2022) and CEMP (Enviroguide Consulting, 2022) submitted under separate cover with the planning application for the Proposed Development.

The construction works will be managed with consideration of applicable regulations and standard international best practice including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors;
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005;
- BPGCS005, Oil Storage Guidelines;
- EPA (2004) IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities;
- CIRIA 697, The SUDS Manual, 2007;
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004;
- Construction Industry Research and Information Association CIRIA C648: Control of water pollution from linear construction projects: Technical guidance (Murnane et al. 2006);
- CIRIA C648: Control of water pollution from linear construction projects: Site guide (Murnane et al. 2006); and
- Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters

15.2.4.1.1.1 Control and Management of Water

There will be no discharges to groundwater or surface water during the Construction Phase. Water runoff to adjoining roads will not be permitted.

There is no anticipation for groundwater dewatering during the construction of the basement and management of water will include control of surface water runoff and pumping of water from excavations.

Where necessary the water will be treated onsite to remove sediment or other potentially contaminating compounds. The treated water will be tankered offsite or discharged to sewer only under licence from Irish Water as appropriate.

During earthworks there is the potential for suspended solids entrained in runoff to enter the gullies on the adjoining roads.

Silt fences will be appropriately located around earthworks areas as appropriate to manage runoff. The contractor is to ensure that no contaminated water/liquids leave the Proposed Development Site (as surface water and surface water run-off or otherwise), enter the local drainage system or direct discharge drainage ditches or water courses or springs in particular the Naniken Stream.

The quality of the discharge of water from excavations will be regularly monitored visually for a hydrocarbon sheen and suspended solids, as well as periodic laboratory testing.

Any erosion control measures (i.e., silt-traps, silt-fencing and swales) will be regularly maintained during the Construction Phase. Any required silt fences or silt-traps must not be placed within 10m of any open water course or drainage ditch.

The flows of water into excavations are anticipated to be small and will be managed by sump pumping, which will be managed in accordance with best practice standards (CIRIA – C750) and regulatory consents.

15.2.4.1.1.2 In-stream Works and Protection of Water Courses

All open water courses adjacent to the site (namely the Naniken Stream) will be protected by a 10m constraint zone around the water course to avoid suspended sediment or other potential contaminants being released into the water course. Site vehicles will only be permitted within this 10m buffer to facilitate instream works to enable construction of the outfall to the Naniken Stream. Crossings of the Naniken Stream will not be required and will not be permitted except in an emergency scenario if required.

All instream works or works carried out at the Naniken Stream will follow the guidelines published by Inland Fisheries Ireland (IFI) 'Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters' (IFI, 2016) and The National Roads Authority (2018) (now Transport Infrastructure Ireland) 'Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes' and other current best-practice standards at the time of construction.

Where instream works are required for the construction of outfalls, the following must be implemented in addition to other measures outlined in Section 7.6:

- Instream machine works will be avoided and if required any machines working in the watercourse must be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels.
- Instream earthworks must be executed so as to minimise the suspension of solids.
- Any over-pumping or temporary diversion of water required must include appropriate treatment of water before return to the water course

- Every care must be taken to insure against spillage of concrete or leakage of cement grout within cofferdams.

A suitably qualified Environmental Clerk of Works will be present on-site during the works being undertaken along the Naniken Stream in particular the construction of the surface water outfall.

Monitoring of all water protection measures and infrastructure (e.g., silt-traps, silt-fences and other operational controls) will be undertaken to ensure effective operation for the duration of the Construction Phase. Any damaged or defective infrastructure will be replaced immediately (within the same working day).

15.2.4.1.1.3 Control and Management of Soil and Bedrock

Prior to excavation, a detailed review of the final cut and fill model will be carried out to confirm cut and fill volumes. As the site is largely undeveloped contaminated soil is not expected to be encountered. Soil analytical data included in the site investigation report (Appendix I) indicates the general absence of contamination associated with anthropogenic sources at the Site. In the event that as yet unidentified contaminated soils or other contaminated materials are encountered during the works, these will be managed in accordance with relevant guidelines including EPA 'Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites' (EPA, 2013) and guidance and standards current at the time of construction works. Potentially contaminated soil to be excavated and removed and disposed of off-site in accordance with the Waste Management Acts, 1996 as amended, and associated regulations and guidance.

Any surplus soil not suitable for re-use as a by-product and other waste materials arising from the Construction Phase will be removed offsite by an authorised contractor and sent to the appropriately authorised (licensed/permitted) receiving waste facilities.

15.2.4.1.1.4 Management of Stockpiles

Stockpiled soil and stone materials pending removal offsite or reuse onsite will be located in designated areas only and there will be no storage of materials within 10m of any boundary, drains and watercourses. Where necessary, stockpiles will be surrounded with silt fencing to filter out any suspended solids from surface water arising from these materials (refer to Section 7.6.1.1).

While waste classification and acceptance at a waste facility is pending, excavated soil for recovery/disposal will be stockpiled as follows:

- A suitable temporary storage area will be identified and designated;
- All stockpiles will be assigned a stockpile number;
- Soil waste categories will be individually segregated; and all segregation, storage & stockpiling locations will be clearly delineated on the Site drawings;
- Erroneous pieces of concrete will be screened from the stockpiled soils and segregated separately;
- Non-hazardous and hazardous soil (if required to be stockpiled) will be stockpiled only on hard-standing or high-grade polythene sheeting to prevent cross-contamination of the soil below; and

- Soil stockpiles will be sealed to prevent run-off of rainwater and leaching of potential contaminants from the stockpiled material generation and/or the generation of dust.

Waste will be stored on-site, including concrete, asphalt and soil stockpiles, in such a manner as to:

- Prevent environmental pollution (bundled and/or covered storage, minimise noise generation and implement dust/odour control measures, as may be required);
- Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling and recovery; and
- Prevent hazards to site workers and the general public during construction phase (largely noise, vibration and dust).

15.2.4.1.1.5 Concrete Works

The use of cementitious grout used during the construction of the basement and other infrastructure will avoid any contamination of the ground through the use of appropriate design and methods implemented by the Contractor and in accordance with industry standards.

All ready-mixed concrete will be delivered to the Proposed Development Site by truck. Concrete mixer trucks will not be permitted to wash out onsite with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite.

There will be a requirement for in-stream and near stream works for the construction of the outfall to the Naniken Stream. Pre-cast structures will be used where technically feasible in accordance with the drainage design specification. Avoidance and mitigation measures for the in-stream works are detailed in Section 7.6.1.2.

15.2.4.1.1.6 Piling Methodology

The proposed piling methodology will minimise the potential for the introduction of any temporary conduit between any potential sources of contamination at the ground surface and underlying groundwater. The piling method will include procedures to ensure any potential impact to water quality is prevented including preventing surface runoff or other piling/drilling fluids from entering the pile bores and surrounding formation. Where there is a requirement to use lubricants, drilling fluids or additives the contractor will use water-based, biodegradable and non-hazardous compounds under controlled conditions.

15.2.4.1.1.7 Importation of Soil and Aggregates

Contract and procurement procedures will ensure that all aggregates and fill material required are sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity and compliance standards and statutory obligations. The storage of imported materials will be located at least 10m away from any surface water features and surrounded with silt fencing to filter out suspended solids.

The importation of aggregates will be subject to management and control procedures which will include testing and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development including the suitability of material that may be imported in accordance with a By-Product Notification under Article 27

of the European Communities (Waste Directive) Regulations 2011. Therefore, any unsuitable material will be identified, avoided and not imported to the Site.

15.2.4.1.1.8 Handling of Fuels and Hazardous Materials:

Fuel, oils and chemicals used during construction are classified as hazardous.

- Storage of fuel and hazardous materials will be undertaken with a view to protecting any essential services (electricity, water etc.) and the receiving land, soil and geology environment.
- Bulk quantities of fuel will not be stored at the Site.

There will be appropriate storage areas for any fuel, oils and chemicals. Storage will be within a clearly marked bund on an impervious base remote from any surface water features such as oil. Temporary oil interceptors will be installed for period of the construction phase. Fuel will only be stored in the quantities required for emergency use and re-fuelling. All drums to be quality approved and manufactured to a recognised standard. If drums are to be moved around the Site, they will be secured and moved on spill pallets. Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

- Bunds will have regard to Environmental Protection Agency guidelines 'Storage and Transfer of Materials for Scheduled Activities' (EPA, 2004) and Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines. All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:
 - 110% of the capacity of the largest tank or drum within the bunded area; or
 - 25% of the total volume of substance that could be stored within the bunded area.
- Only emergency maintenance will be carried out on site;
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Site and compliantly disposed of off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with current industry best practice procedures and EPA guidelines;
- Site staff will be familiar with emergency procedures in the event of accidental fuel spillages; and
- All staff on-site will be fully trained on the use of equipment to be used on-site.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at designated refuelling station locations onsite and will be from a road tanker brought to site as required. Each station will be fully contained and equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed by the contractor before the commencement of works onsite.

15.2.4.1.1.9 Welfare Facilities

Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. All waste from welfare facilities will be managed in accordance with the relevant statutory obligations through either a temporary connection to mains foul sewer (subject to receipt of the relevant consent from Irish Water) which will be constructed in accordance with Irish Water guidelines or by tankering of waste offsite by an appropriately authorised contractor in compliance with all legislative requirements.

15.2.4.1.1.10 Wheel-Wash and Water Treatment Facilities

The use of wheel-wash and water treatment facilities and infrastructures will be used where necessary including where outlined in Sections 7.6.1.1 through to 7.6.1.9. The correct use and management of these will be undertaken by the appointed contractor to ensure that there is no harm or impact to the receiving water environment.

To prevent tracking of dust and debris on haul routes offsite the following will be undertaken:

- Implement a wheel washing system.
- Use of dedicated internal haul routes and set down areas that will be covered with hardcore or similar.

To prevent fugitive runoff from the Site the following will be implemented:

- Silt traps, silt fences and tailing ponds will need to be provided by the contractor where necessary to prevent silts and soils being washed away by heavy rains during the course of the construction stage.
- Surface water runoff and water pumped from the excavation works will be discharged via a silt trap / settlement pond to the existing foul drainage network.
- Onsite water treatment system will be used if required to remove suspended solids and hydrocarbons.

All sludges and other waste from wheel-wash and water treatment infrastructure including silt fences will be removed from the Site by the contractor in accordance with all legislative requirements.

15.2.4.1.1.11 Decommissioning of Boreholes

Any site investigation and monitoring boreholes remaining at the Site that are no longer required will be decommissioned in accordance with the specifications outlined in EPA Advice Noted 14 (EPA, 2013) and current best-practice at the time of decommissioning. This will remove any potential direct conduit for contaminants to enter the groundwater directly and potentially migrate offsite.

15.2.4.1.2 Operational Phase

Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures in accordance with CIRIA SuDS Manual C753 will be incorporated into the overall management strategy for the Proposed Development.

With regard to the proposed discharge of treated operational surface water from the Proposed Development to the Naniken Stream, the potential for surface water generated at the Site of

the Proposed Development to cause significant effects to downstream sensitivities during the Operational Phase would be considered negligible due in part to the SUDS measures incorporated in the Project Design. Project specific SUDS measures are described below.

There is no other requirement for mitigation measures for the Operational Phase of the Proposed Development

15.2.4.2 Monitoring

15.2.4.2.1 Construction Phase

During the construction phase the following monitoring measures will be considered:

- Monitoring and sampling of groundwater and surface water will be undertaken during critical stages of the construction works in particular during construction of the outfall at the Naniken and during bulk excavation works where groundwater may be encountered.
- Inspections and monitoring will be undertaken during excavations, piling and other groundworks to ensure that measures protective of water quality are fully implemented and effective.
- Discharges to sewers will be monitored in accordance with statutory consents (discharge licence).
- Routine monitoring and inspections during refuelling, concrete works to ensure no impacts and compliance with ameliorative, remedial and reductive measures.
- Materials management and waste audits will be carried out at regular intervals

15.2.4.2.2 Operational Phase

Ongoing regular operational monitoring and maintenance of drainage and the SuDS will be carried out.

No other monitoring is required during the Operational Phase.

15.2.5 Air Quality

15.2.5.1 Mitigation

15.2.5.1.1 Construction Phase

It is not expected that adverse air quality impacts are likely to occur at sensitive receptors as a result of the Proposed Development. However, appropriate mitigation measures, as outlined within the Construction Environmental Management Plan (CEMP), will be employed as necessary to further prevent such impacts occurring:

- The roads in the vicinity of the Site are all surfaced and no dust is anticipated arising from unsealed surfaces outside the Site;
- A regime of 'wet' road sweeping can be set up to ensure the roads around the immediate Site are as clean and free from dirt / dust arising from the Site, as is reasonably practicable. This cleaning will be carried out by approved mechanical sweepers;
- Footpaths immediately around the Site can be cleaned by hand regularly, with damping as necessary;
- Vehicle waiting areas or hard standings can be regularly inspected and kept clean by brushing or vacuum sweeping and will be regularly sprayed to keep moist, if necessary;
- Vehicle and wheel washing facilities can be provided at Site exit(s) where practicable. If necessary, vehicles can be washed down before exiting the Site;
- Netting can be provided to enclose scaffolding in order to mitigate escape of air borne dust from the existing and new buildings;
- Vehicles and equipment will not emit black smoke from exhaust system, except during ignition at start up;
- Engines and exhaust systems should be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation;
- Servicing of vehicles and plant should be carried out regularly, rather than just following breakdowns;
- Internal combustion plant should not be left running unnecessarily;
- Where possible fixed plant such as generators should be located away from residential areas;
- The number of handling operations for materials will be kept to a minimum in order to ensure that dusty material is not moved or handled unnecessarily;
- The transport of dusty materials and aggregates should be carried out using covered / sheeted lorries;
- Material handling areas should be clean, tidy and free from dust;
- Vehicle loading should be dampened down and drop heights for material to be kept to a minimum;
- Drop heights for chutes / skips should be kept to a minimum;
- Dust dispersal over the Site boundary should be minimised using static sprinklers or other watering methods as necessary;
- Stockpiles of materials should be kept to a minimum and if necessary, they should be kept away from sensitive receptors such as residential areas etc;
- Stockpiles where necessary, should be sheeted or watered down;
- Methods and equipment should be in place for immediate clean-up of spillages of dusty material;
- No burning of materials will be permitted on Site;

- Earthworks excavations should be kept damp where necessary and where reasonably practicable;
- Cutting on Site should be avoided where possible by using pre-fabrication methods;
- Equipment and techniques for cutting / grinding / drilling / sawing / sanding etc., which minimise dust emissions and which have the best available dust suppression measures, should be employed;
- Where scabbling is to be employed, tools should be fitted with dust bags, residual dust should be vacuumed up rather than swept away, and areas to be scabbled should be screened off;
- Wet processes should be used to clean building facades if possible. If dry grit blasting is unavoidable then ensure areas of work are sealed off and dust extraction systems used;
- Where possible pre-mixed plasters and masonry compounds should be used to minimise dust arising from on-site mixing;
- Prior to commencement, the Main Contractor should identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions. Furthermore, the Main Contractor should prepare environmental risk assessments for all dust generating processes, which are envisaged;
- The Main Contractor should allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.

15.2.5.1.2 Operational Phase

It has been determined that the Operational Phase air quality impact is negligible and therefore no site-specific mitigation measures are proposed.

15.2.5.2 Monitoring

The monitoring of construction dust during the Construction Phase of the Proposed Development is recommended to ensure that impacts are not experienced beyond the Site boundary. Monitoring of dust can be carried out by using the Bergerhoff Method. This involves placing Bergerhoff Dust Deposit Gauges at a strategic locations along the Site boundaries for a period of 30 +/- 2 days. The selection of sampling point locations should be carried out in consideration of the requirements of *VDI 2119* with respect to the location of the samplers relative to buildings and other obstructions, height above ground, and sample collection and analysis procedures. After the exposure period is complete, the Gauges should be removed from the Site; the dust deposits in each Gauge will then be determined gravimetrically and expressed as a dust deposition rate in $\text{mg}/\text{m}^2/\text{day}$ in accordance with the relevant standard.

Due to the negligible impact on air quality and climate from the Operational Phase of the Proposed Development, no specific monitoring is recommended.

15.2.5.3 Climate

As negative climatic impacts associated with the Construction and Operational Phases of the Proposed Development are negligible, no mitigation measures are proposed. Best practice measures will be implemented to minimise exhaust emissions from construction and operational vehicles and machinery by avoidance of engines running unnecessarily, as idle engines will not be permitted for excessive periods. Furthermore, all proposals for development will seek to achieve the greatest standards of sustainable construction and design and will have regard to sustainable building design criteria.

15.2.6 Noise & Vibrations

15.2.6.1 Mitigation

15.2.6.1.1 Construction Phase

In order to control likely noise impacts caused by the Proposed Development, best available technology will be employed by the appointed Main Contractor to minimise noise from the construction operations and will comply with the mitigation measures as set out in *BS 5228-1: A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoid unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Where noise becomes a source of resonating body panels and cover plates, additional stiffening ribs or materials should be safely applied where appropriate.
- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Appointing a site representative responsible for matters relating to noise.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

The Construction Environmental Management Plan outlines the following proposed environmental noise mitigation measures:

General Considerations:

- All site staff will be briefed on noise mitigation measures and the application of best practicable means to be employed to control noise.
- Site hoarding should be erected to maximise the reduction in noise levels.
- The contact details of the Main Contractor and site manager will be displayed to the public, together with the permitted operating hours, including any special permissions given for out of hours work.
- In the event that the Main Contractor gets a complaint about noise from a neighbour immediate action will be taken to remedy the situation.
- The site entrance will be located to minimise disturbance to noise sensitive receptors.
- Internal haul routes will be maintained, and steep gradients will be avoided.
- Material and plant loading and unloading will only take place during normal working hours unless the requirement for extended hours is for traffic management (i.e. road closure) or health and reasons (written approval, must be obtained from the planning authority prior to this activity being undertaken).
- Use rubber linings in chutes, dumpers and hoppers to reduce impact noise.
- Minimise opening and shutting of gates through good coordination of deliveries and vehicle movements.

Plant:

- Ensure that each item of plant and equipment complies with the noise limits quoted in the relevant European Commission Directive 2000/14/EC.
- Fit all plant and equipment with appropriate mufflers or silencers of the type recommended by the manufacturer.
- Use all plant and equipment only for the tasks for which it has been designed.
- Shut down all plant and equipment in intermittent use in the intervening periods between work or throttle down to a minimum.
- Power all plant by mains electricity where possible rather than generators.
- Maximise screening from existing features or structures and employ the use of partial or full enclosures for fixed plant.
- Locate movable plant away from noise sensitive receptors where possible
- All plant operators to be qualified in their specific piece of plant.
- Compressors and generators will be sited in areas least likely to give rise to nuisance where practicable.

Vehicle activity:

- Ensure all vehicle movement (on site) occur within normal working hours. (other than where extension of work requiring such movements has been granted in cases of required road closures or for health and safety reasons).
- Plan deliveries and vehicle movements so that vehicles are not waiting or queuing on the public highway, if unavoidable engines should be turned off.
- Plan the site layout to ensure that reversing is kept to a minimum.
- Where reversing is required use broadband reverse sirens or where it is safe to do so disengage all sirens and use banksmen.
- Rubber/neoprene or similar non-metal lining material matting to line the inside of material transportation vehicles to avoid first drop high noise levels.
- Wheel washing of vehicles prior to exiting the site will take place to ensure that adjoining roads are kept clean of dirt and debris. Regular washing of adjoining streets should also take place as required by road sweepers.

Demolition Phase:

- Employ the use of acoustic screening; this can include planning the demolition sequence to utilise screening afforded by buildings to be demolished.
- If working out of hours for Health and Safety reasons (following approval by the competent authority) limit demolition activities to low level noise activity (unless absolutely unavoidable).
- Use low impact demolition methods such as non-percussive plant where practicable.
- Use rotary drills and 'bursting' activated by hydraulic or electrical power or chemically based expansion compounds to facilitate fragmentation and excavation of hard material.
- Avoid the transfer of noise and vibration from demolition activities to adjoining occupied buildings through cutting any vibration transmission path or by structural separation of buildings.
- Consider the removal of larger sections by lifting them out and breaking them down either in an area away from sensitive receptors or off site.

Ground Works and Piling Phase:

- The following hierarchy of groundwork/piling methods should be used if ground conditions, design and safety allows;
 - Pressed in methods, e.g., hydraulic jacking
 - Auger/bored piling
 - Diaphragm walling
 - Vibratory piling or vibro-replacement
 - Driven Piling or dynamic consolidation
- The location and layout of the piling plant should be designed to minimise potential noise impact of generators and motors.
- Where impact piling is the only option utilise a non-metallic dolly between the hammer and driving helmet or enclose the hammer and helmet with an acoustic shroud.
- Consider concrete pour sizes and pump locations. Plan the start of concrete pours as early as possible to avoid overruns.
- Where obstructions are encountered, work should be stopped, and a review undertaken to ensure that work methods that minimise noise are used.
- When using an auger piling rig do not dislodge material from the auger by rotating it back and forth. Use alternate methods where safe to do so.
- Prepare pile caps using methods which minimise the use of breakers, e.g., use hydraulic splitters to crack the top of the pile.

Communication and Liaison:

- Community Liaison Plan should be developed by the developer in consultation with local residents/businesses and a single point of contact nominated to engage with Dublin City Council and the residents/businesses and to handle complaints and communication of site information.
- All site staff should be briefed on the complaints procedure and mitigation requirements and their responsibilities to register and escalate complaints received.

The control measures are also to be implemented:

- Site Manager will monitor a likelihood of prolonged exposure to excessive noise and commission noise surveying/monitoring programme where necessary.
- Works Supervisor will assess risk arising from noise prior to each particular activity taking place and determine appropriate action. The aim will be to minimise the exposure to excessive noise levels.
 - If it is likely that the noise exposure exceeds Lower Action Value, then hearing protection must be made available.
 - If it is likely that the noise exposure exceeds Upper Action Value, then hearing protection is mandatory to be used. Work Supervisor will decide on the most suitable hearing protection to be used based on Exposure (see formula above) and worker's personal preference (earmuffs or earplugs).
- Works Supervisor will ensure proposed measures are put in place and that their effectiveness and suitability is evaluated on regular bases.
- Site management will minimise noise at work by looking for alternative processes and/or working methods, which would make the work quieter and/or exposure times shorter.

- Site Manager will liaise with all site contractors in order to effectively control noise exposure.
- Number of people working near source of the noise will be minimised.
- Plant and machinery will be compliant with current legislation and fitted with silencers where possible.
- Employees must use hearing protection where its use is made compulsory.
- Hearing protection zones will be identified where necessary.
- Spot checks on appropriate use of hearing protection will be carried out.
- Operators of rock breaking machines and workers nearby must wear adequate ear protection.

15.2.6.1.2 Operational Phase

During the operational phase of the development, noise mitigation measures with respect to the outward impact of the development are not deemed necessary.

15.2.6.2 Monitoring

- Carry out regular on-site observation monitoring and checks/audits to ensure that best management practices are being used at all times. Such checks will include:
 - Hours of work;
 - Presence of mitigation measures;
 - Number and type of plant;
 - Construction methods.
- In the event that the Main Contractor gets a complaint about noise from a neighbour, he will act immediately to remedy the situation.
- A sound level digital meter will be employed as necessary to monitor noise, with results being recorded to inform the contractor of noise level.
- Site reviews must be recorded and made available for inspection.
- Appraise and review working methods, processes and procedures on a regular basis to ensure continue development of best management practices.

15.2.7 Landscape & Visual

15.2.7.1 Mitigation

15.2.7.1.1 Construction Phase

A site hoarding will be erected at the commencement of construction for numerous safety and amenity reasons. One of the key landscape and visual benefits of this will be the screening of early stage ground works and ground-based activity throughout the course of the construction phase. There are no specific landscape and visual mitigation otherwise proposed during the construction phase.

15.2.7.1.2 Operational Phase

Specific landscape and visual mitigation measures are not considered necessary for the operational stage development. Instead, mitigation measures can be considered to be embedded into the multi-faceted design of the Proposed Development during the operational phase, particularly the landscape design, which will help to assimilate the built elements of the development and complement the parkland character of the surroundings.

15.2.7.2 Monitoring

No monitoring is required during the construction and operational phase, with regards to this Landscape/ townscape Visual Impact Assessment.

15.2.8 Architecture , Archaeology and Cultural Heritage

15.2.8.1 Architecture

It was noted in the building survey that there is a brick and stone wall just outside the northern boundary of the site and that this wall was formerly the northern perimeter wall of the enclosed garden associated with Maryville, the house that formerly stood on the site. There would be no direct impact on the wall arising from the Proposed Development, either during the Construction Phase or during the Operational Phase, though there would be a need to safeguard it during the construction phase to ensure that no accidental damage occurs. The wall in its present setting is out of context with its original function, in which it would have been used to enclose the walled garden and to provide a surface on which fruit trees and other plants could be grown, with a south-facing aspect and with the brick facing providing a heat sink to assist growth. The Proposed Development would be equally out of context with the original setting, while the proposed apartments in the vicinity would have ample space around them, leaving the wall with landscaped grounds separating it from the apartment buildings.

Mitigation required: The wall is to be protected from accidental damage during construction by means of a strong timber fence or hoarding.

15.2.8.2 Archaeology and Cultural Heritage

Three areas of archaeological potential were identified as being present within the footprint of the Proposed Development and where avoidance during the Construction Phase of the Proposed Development is not possible the following case appropriate mitigation measures are recommended:

AAP1 Mitigation required: The section of the boundary which will be impacted upon by the entrance avenue to the Proposed Development should be subject to investigation by a suitably qualified archaeologist, under licence to the Department of Housing, Local Government and Heritage, in order to fully ascertain the archaeological potential of this feature and, where necessary, a full written, drawn, photographic record will be made of this section of the feature, with environmental sampling, if deemed appropriate. This will in effect preserve the impacted section by record, where the remaining, unimpacted sections will be preserved in situ.

AAP 2 Mitigation required: The full extent of the buried sub surface features and elements of archaeological and cultural heritage interest should be ascertained by a program of archaeological test excavation, conducted by a suitably qualified archaeologist, under licence to the Department of Housing, Local Government and Heritage, in order to fully ascertain the archaeological potential of the remains. Following the successful completion of that program of test trenching a report should be prepared for submission to the National Monuments Service and the planning authority for further consultation and if deemed necessary further investigation/excavation.

AAP3 Mitigation required: The full extent of any unknown subsurface elements of archaeological and cultural heritage interest should be ascertained by a program of archaeological test excavation, conducted by a suitably qualified archaeologist, under licence to the Department of Housing, Local Government and Heritage, in order to assess the site for the presence of archaeological remains and to fully ascertain the archaeological potential of the remains, should any be uncovered. Following the successful completion of that program of test trenching a report should be prepared for submission to the National Monuments

Service and the planning authority for further consultation and if deemed necessary further investigation/excavation.

Where there is no archaeological material shown to be present during the test trenching phase, it may be prudent to undertake a programme of licenced archaeological monitoring during the ground reduction programme until the level of undisturbed deposits is reached, in order to further mitigate for the presence of unknown archaeological finds, features or deposits.

The application of the pertinent and necessary mitigation measures recommended above, and any others deemed relevant by the National Monuments Service and Dublin City Council, should be applied prior to the Construction Phase of the Proposed Development, in order to minimize any potential delays to construction and to eliminate any risk to the archaeological and cultural heritage of the site. As a result, there would be no further impact to the archaeological or cultural heritage of the site during the Operational Phase of the Proposed Development.

15.2.8.3 Monitoring

No specific monitoring measures are required in relation to architecture, archaeology and cultural heritage for the Proposed Development during the Operation Phase.

15.2.9 Materials Assets: Waste and Utilities

15.2.9.1 Mitigation

Specific avoidance, remedial and mitigation measures will be required for the Proposed Development. The measures that will be taken to ensure that there will be no significant impact on the surrounding Local Settlement and Material Assets include:

- Preparation of a Construction Management Plan by each Contractor
- Construction Management Plans to be in effect for the full duration of works
- Implementation of a Construction and Demolition Waste Management Plan
- Working hours from 08:00 to 17:00 Mondays to Fridays and 08:00 to 14:00 Saturdays (and as set by DCC)
- Heavy goods vehicles arrival and departure scheduled outside core times when students are entering/leaving the St. Pauls College
- Dust and Noise Management and Minimisation Plan in operation during construction
- Appropriate management of construction traffic and waste/spoil stockpiles
- Testing of potable water networks and foul water sewers prior to connection
- Identification and protection of utilities and public services, and reinstatement of all services as soon as possible post connection.

Waste management during the Construction Phase will be managed in accordance with the CDWMP prepared by Waterman Moylan (2022) for the Proposed Development. Waste will be managed in compliance with the Waste Management Act 1996 (as amended) and all subordinate legislation. Measures to minimise waste generation, promote re-use and recycling and recovery of wastes will be implemented throughout the Construction Phase.

Waste will be stored onsite in the dedicated waste segregation areas in such a manner as to:

- Prevent environmental pollution.
- Minimise nuisance generation such as dust.
- Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling, and recovery.

Waste segregation areas, particularly those containing flammable wastes, will be located away from any potential sources of ignition (i.e., hot works zones), and no smoking will be allowed onsite, in order to prevent fire outbreak in waste segregation areas.

In the event that hazardous soil, or historically deposited waste is encountered during the site bulk excavation phase, the contractor will notify DCC and provide a Hazardous/Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal/treatment, in addition to information on the proposed authorised waste collector(s). This soil will then be removed by an appropriately accredited contractor and disposed of at an appropriately accredited facility.

There are prefabricated/modular buildings to be removed from the site to accommodate the new site access road. According to the CDWMP this will require a preliminary survey to assess the requirement of an asbestos survey. If an asbestos survey is required and indicates the presence of Asbestos Containing Materials (ACMs), it must be safely removed and disposed of by an appropriate specialist before further demolition can be undertaken. Removal of asbestos or ACMs will be carried out by a suitably qualified contractor and ACM's will only be

removed from site by a suitably permitted/licenced waste contractor. in accordance with S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.

15.2.9.2 Monitoring

15.2.9.2.1 Construction Phase

The monitoring of C&D waste during the Construction Phase of the Proposed Development is recommended to ensure that impacts are not experienced beyond the Site boundary. The Main Contractor will be responsible for monitoring and record keeping in respect of waste leaving the facility and that these records will be maintained on site.

15.2.9.2.2 Operational Phase

The building management company, residents, tenants, childcare facility and nursing home operators will be required to maintain the bins and storage areas in good condition as required by the DCC Waste Bye-Laws. The waste strategy presented in the OWMP will provide sufficient storage capacity for the estimated quantity of segregated waste. The designated areas for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy. The areas will be fitted with CCTV for monitoring.

15.2.10 Traffic

15.2.10.1 Construction Phase

15.2.10.1.1 Mitigation

It is considered that a Construction Management Plan (CMP) will be prepared by the appointed contractor in order to minimise the potential impact of the construction phase of the Proposed Development on the safety and amenity of other users of the public road. The CMP will consider the following aspects:

- Dust and dirt control measures.
- Noise assessment and control measures
- Routes to be used by vehicles
- Working hours of the site
- Details of construction traffic forecasts
- Time when vehicle movements and deliveries will be made to the site
- Facilities for loading and unloading
- Facilities for parking cars and other vehicles
- Signage at site access.

A Preliminary Construction, Demolition & Waste Management Plan has been included under a separate cover and includes preliminary mitigation measures. Preliminary measures include:

- Parking will be provided on site. No on-street parking or parking in the local residential areas will be permitted;
- Minimise the volume of material removed from site by optimising the cut to fill requirements within the site in order to reduce construction traffic require;
- A dedicated material storage area will be set up on the site.
- Peak construction traffic and deliveries will occur outside the peak traffic hours for peak traffic and also outside opening and closing times of the school.

Due to the volume of excavation material required (107,500m³) and the large daily number of HGVs required. It is proposed to store excavated material on-site and increase the phasing programme of removing excavated material from the site. The excavation process will remain unchanged, but the removal of excavated material will now be 8-months. This will decrease the daily traffic numbers and reduce the impact of the construction phase on the surrounding network.

Further to the above, a detailed Traffic Management Plan (TMP) will be prepared by the Main Contractor. This document will outline proposals in relation to construction traffic and associated construction activities that impact the surrounding roads network. The document will be prepared in coordination and agreed with the local authority.

The Main Contractor will be required to schedule delivery of materials strictly on a daily basis. As there are adequate storage facilities available on site it is not envisaged that there will be any necessity to provide a secure material staging compound remote from the site in which to

temporarily store materials from suppliers until such time as these can be accommodated on site. Instead, a dedicated material storage area will be set up on the site.

Care will be taken to ensure existing pedestrian and cycling routes are suitably maintained or appropriately diverted as necessary during the construction period, and temporary car parking is provided within the site for contractor's vehicles.

It is likely that construction will have a not significant impact on pedestrian and cycle infrastructure. This is because the site is approximately 150m away from the main road and pedestrian pathways. There will be short term effects to the pedestrian and cycle infrastructure at the site access point. Mitigation measures such as specific haul routes and haul times avoiding the peak traffic hours will help reduce the impact of the Construction Phase.

15.2.10.1.2 Monitoring

During the Construction Phase the following monitoring is advised. The specific compliance exercises to be undertaken in relation to the range of measures detailed in the final construction management plan will be agreed with the planning authority.

- Construction vehicles routes and parking
- Internal and external road conditions
- Construction activities hours of work

15.2.10.2 *Operational Phase*

15.2.10.2.1 Mitigation

The Proposed Development is situated adjacent to suitable infrastructure and transport services for travel by sustainable modes. A key barrier to modal shift towards sustainable modes of travel is often a lack of information about potential alternatives to the car. As such, it is proposed that residents will be made aware of potential alternatives including information on walking, cycle routes and public transport.

Residents will be encouraged to avail of these facilities for travel to and from work. Provision of this information would be made during the sales process and will be included in the new homeowner's pack upon the sale of each unit, as this represents the best opportunity to make residents aware and to secure travel behaviour change. It is anticipated that this measure may help to reduce the level of traffic at the Proposed Development, thus providing mitigation against any traffic and transport effects of the development.

A Travel Plan has been included in this application under separate cover. This Plan sets out methods to reduce the dependence on private car journeys and to encourage residents within the Proposed Development to avail of sustainable forms of transport such as walking, cycling and public transport.

As part of the DCC Draft Development Plan 2022 – 2028, a current and target mode share has been included for the whole DCC Area. This modal split is based on addressing climate change through sustainable mobility.

The current Mode Share available (2019) for the DCC area is broken down as follows:

- Walking – 11%
- Cycling – 6%
- Public Transport (bus, rail, LUAS) – 54%

- Private Vehicles (car, taxi, goods, motorcycles) – 29%

This is for the whole DCC area and therefore the existing modal split in Section 8.2 must also be taken into account.

The Target Modal Split for DCC lands is outlined below.

- Walking: 13%
- Cycling: 13%
- Public Transport (bus, rail, LUAS): 57%*
- Private Vehicles (Car, taxi, goods, motorcycles): 17%

*The increase in public transport mode share anticipates the construction of major public transport infrastructure that is proposed to occur over the lifetime of the plan. The impact of public transport infrastructure projects on mode share is more likely to come into fruition during the lifespan of the following plan.

This target modal split for the subject area surrounding the Proposed Development will differ from the DCC Target split due to the location of the development. The Proposed Development target split proposed is as follows:

- Walking: 15%
- Cycling: 25%
- Public Transport (bus, rail, LUAS): 40%
- Private Vehicles (Car, taxi, goods, motorcycles): 20%

This modal split heavily encourages cycling as the Proposed Development is close to Dublin city centre and with the introduction of the GDA Cycle Network Plan commuting by bicycle will be significantly easier.

15.2.10.2.2 Monitoring

The Travel Plan for the Proposed Development will be monitored and updated at regular intervals. This will enable tracking in terms of a reduction in the dependence on private car journeys and a shift towards sustainable transport options such as walking, cycling and the use of public transport such as buses and trains.

A management company will be appointed by the developer to manage the development. A senior member of staff from the management company who supports the philosophy of the Plan will be appointed as the Co-ordinator. The Co-ordinator should be appointed within 2 months of the Site being occupied. A dedicated commuter space will be provided within the tenant amenity area where travel information, timetables, access to the internet and notice boards will be provided.

The Co-ordinator's roles in the development, implementation and management of the Plan shall include:

- Promotion of the Travel Plan to residents;
- Implementation and maintenance of the Plan;
- Monitoring progress of the Plan;

- Liaison with public transport operators and officers of the Planning and Highway Authorities;
- Production of information reports for the Developer, the Occupier(s) and the Planning and Highway Authorities; and
- Ongoing assessment of the objectives of the Plan.

Within the first 4 months of being appointed, the Co-ordinator will arrange for a resident's travel survey to be carried out. This can be achieved by means of self-completion questionnaires, which will help to identify travel requirements and set targets and needs.

The information requested in the questionnaire should include:

- Personal details;
- Primary mode of transport;
- Current travel patterns including the time taken to travel to work and the place of work;
- Views on alternative modes to the car (i.e. what would encourage them to switch to other modes); and
- Usage of car sharing scheme;

Traditionally, response rates to such questionnaires are relatively low and it may be necessary to encourage recipients to complete and return them.

The information obtained from the survey should be entered onto a database and used to formulate and monitor the implementation of the Plan and to set and review targets. These targets are to be agreed with the Planning and Highway Authorities or their agents within 6 months of the survey being carried out.

Up to date local bus and rail timetables will be maintained within the tenant amenity area and other fixed points within the facilities on the site. Residents will be advised of their location. In addition, Internet access to travel information will be provided. The developer will provide all new residents with a travel pack showing alternative modes of travel to the development. Where possible, the developer will advise visitors to the site of alternative modes of travel to that of the car.

Secure bicycle parking facilities will be provided for residents at designated areas within the apartment blocks and on the curtilage of each house. For visitors and Crèche users, a number of bicycle parking will be provided through the site at the surface level. Local cycle route information will be provided in the tenant amenity area and at other fixed points within the development, and residents will be advised of their location.

The co-ordinator will be responsible for the management of inappropriate parking within the development.