

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

VOLUME II

Direct Application for Approval to An Bord Pleanála in accordance with Section 175 of the Planning and Development Act 2000 (as amended)



PROPOSED RESIDENTIAL AND MIXED USE DEVELOPMENT

AT

EMMET ROAD, INCHICORE, DUBLIN 8

Prepared by



In Conjunction with

OCSC Consulting Engineers/Enviroguide/Byrne Environmental/IAC Archaeology/Blackwood Associates

TABLE OF CONTENTS

1.0	INTRODUCTION AND METHODOLOGY	1-1
1.1	EIA LEGISLATION, DEFINITION OF EIA AND EIAR	1-1
1.2	EIA GUIDELINES	1-4
1.3	EIA PROCESS OVERVIEW	1-5
1.4	SCREENING – REQUIREMENT FOR EIA	1-6
1.5	PROJECT SCOPING AND CONSULTATION.....	1-6
1.6	PUBLIC CONSULTATION.....	1-8
1.7	INFORMATION TO BE CONTAINED IN AN EIAR.....	1-9
1.8	FORMAT AND STRUCTURE OF THIS EIAR	1-13
1.9	IMPACT ASSESSMENT METHODOLOGY	1-16
1.10	EIAR PROJECT TEAM.....	1-18
1.11	RELATED DEVELOPMENT AND CUMULATIVE IMPACTS	1-24
1.12	TRANSBOUNDARY IMPACTS	1-26
1.13	LINKS BETWEEN EIA AND APPROPRIATE ASSESSMENT/NIS.....	1-26
1.14	AVAILABILITY OF EIAR DOC	1-27
1.15	IMPARTIALITY	1-27
1.16	STATEMENT OF DIFFICULTIES ENCOUNTERED	1-27
1.17	FORECASTING METHODS USED FOR ENVIRONMENTAL EFFECTS.....	1-27
1.18	EIA QUALITY CONTROL AND REVIEW	1-27
1.19	ERRORS.....	1-28
2.0	DESCRIPTION OF THE PROJECT AND ALTERNATIVES EXAMINED	2-1
2.1	INTRODUCTION AND TERMS OF REFERENCE.....	2-1
2.2	DESCRIPTION OF THE LOCATION OF THE PROJECT	2-1
2.3	DESCRIPTION OF THE PHYSICAL CHARACTERISTICS OF THE WHOLE PROPOSED DEVELOPMENT	2-6
2.4	DESCRIPTION OF THE MAIN CHARACTERISTICS OF THE OPERATIONAL PHASE OF THE PROJECT	2-25
2.5	AN ESTIMATE, BY TYPE AND QUANTITY, OF EXPECTED RESIDUES AND EMISSIONS DURING THE CONSTRUCTION AND OPERATION PHASES	2-26
2.6	DESCRIPTION OF THE MAIN CHARACTERISTICS OF THE CONSTRUCTION PHASE	2-29
2.7	DESCRIPTION OF CHANGES TO THE PROJECT	2-34
2.8	DIRECT AND INDIRECT EFFECTS RESULTING FROM USE OF NATURAL RESOURCES.....	2-35

2.9 DIRECT AND INDIRECT EFFECTS RESULTING FROM EMISSION OF POLLUTANTS, CREATION OF NUISANCES AND ELIMINATION OF WASTE2-35

2.10 ALTERNATIVES EXAMINED2-35

3.0 POPULATION AND HUMAN HEALTH3-1

3.1 INTRODUCTION3-1

3.2 STUDY METHODOLOGY3-1

3.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)3-2

3.4 AGE PROFILE3-7

3.5 SOCIAL CLASS3-7

3.6 EDUCATIONAL ATTAINMENT3-8

3.7 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT3-15

3.8 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT3-15

3.9 ‘DO NOTHING’ SCENARIO3-21

3.10 AVOIDANCE, REMEDIAL & MITIGATION MEASURES3-22

3.11 PREDICTED RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT3-22

3.12 POTENTIAL CUMULATIVE IMPACTS3-23

3.13 MONITORING3-25

3.14 INTERACTIONS3-25

3.15 REINSTATEMENT3-25

3.16 DIFFICULTIES ENCOUNTERED IN COMPILING3-25

3.17 REFERENCES3-25

4.0 BIODIVERSITY4-1

4.1 INTRODUCTION4-1

4.2 METHODOLOGY4-3

4.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)4-11

4.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT4-38

4.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT4-41

4.6 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES4-48

4.7 “WORST CASE” SCENARIO4-52

4.8 RESIDUAL IMPACTS4-52

4.9 MONITORING4-56

4.10 REINSTATEMENT4-56

4.11 INTERACTIONS4-56

4.12 DIFFICULTIES ENCOUNTERED IN COMPILING4-56

4.13 SUMMARY4-56

4.14 REFERENCES4-56

5.0 LAND AND SOILS5-1

5.1 INTRODUCTION5-1

5.2 ASSESSMENT METHODOLOGY5-1

5.3 BASELINE SCENARIO (RECEIVING ENVIRONMENT)5-3

5.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT5-16

5.5 POTENTIAL IMPACTS EFFECTS OF THE PROPOSED DEVELOPMENT AND WATERMAIN UPGRADE..
.....5-19

5.6 MITIGATION MEASURES5-23

5.7 RESIDUAL IMPACTS5-28

5.8 MONITORING5-33

5.9 INTERACTIONS5-33

5.10 DIFFICULTIES ENCOUNTERED5-34

5.11 CUMULATIVE IMPACTS5-34

5.12 DO NOTHING SCENARIO5-36

5.13 REFERENCE AND SOURCES5-36

6.0 WATER AND HYDROLOGY6-1

6.1 INTRODUCTION6-1

6.2 METHODOLOGY6-1

6.3 RECEIVING ENVIRONMENT (BASELINE SCENARIO)6-3

6.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT6-9

6.5 POTENTIAL IMPACTS (EFFECTS) OF THE PROPOSED DEVELOPMENT6-10

6.6 AVOIDANCE, REMEDIAL & MITIGATION MEASURES6-11

6.7 PREDICTED IMPACT FOLLOWING MITIGATION (RESIDUAL IMPACT)6-13

6.8 WORST CASE SCENARIO6-13

6.9 MONITORING6-14

6.10 CUMULATIVE IMPACTS6-14

6.11 INTERACTIONS6-15

6.12 DIFFICULTIES ENCOUNTERED6-15

6.13 REFERENCES6-15

7.0 AIR QUALITY AND CLIMATE7-1

7.1 INTRODUCTION7-1

7.2 STUDY METHODOLOGY7-1

7.3 RECEIVING ENVIRONMENT (BASELINE SCENARIO)7-7

7.4 EXISTING CLIMATE RECEIVING ENVIRONMENT (BASELINE SCENARIO)7-12

7.5	CHARACTERISTICS OF THE PROPOSED DEVELOPMENT	7-13
7.6	POTENTIAL IMPACTS/EFFECTS OF THE PROPOSED DEVELOPMENT	7-13
7.7	AVOIDANCE, REMEDIAL AND MITIGATION MEASURES	7-15
7.8	PREDICTED IMPACTS/EFFECTS OF THE PROPOSED DEVELOPMENT	7-16
7.9	MONITORING.....	7-18
7.10	REINSTATEMENT	7-20
7.11	CUMULATIVE IMPACTS/EFFECTS	7-20
7.12	DO NOTHING' IMPACT.....	7-20
7.13	INTERACTIONS	7-20
7.14	DIFFICULTIES ENCOUNTERED IN COMPILING INFORMATION.....	7-21
8.0	NOISE AND VIBRATION	8-1
8.1	INTRODUCTION	8-1
8.2	STUDY METHODOLOGY	8-1
8.3	EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO).....	8-4
8.4	CHARACTERISTICS OF THE PROPOSED DEVELOPMENT	8-10
8.5	POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT.....	8-11
8.6	CUMULATIVE NOISE IMPACTS.....	8-12
8.7	AVOIDANCE, REMEDIAL AND MITIGATION MEASURES	8-13
8.8	PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT	8-16
8.9	MONITORING.....	8-19
8.10	REINSTATEMENT.....	8-20
8.11	INTERACTIONS	8-20
8.12	DIFFICULTIES ENCOUNTERED IN COMPILING	8-20
9.0	LANDSCAPE AND VISUAL IMPACT ASSESSMENT	9-1
9.1	INTRODUCTION	9-1
9.2	STUDY METHODOLOGY	9-1
9.3	EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO).....	9-7
9.4	CHARACTERISTICS OF THE PROPOSED DEVELOPMENT	9-26
9.5	POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT	9-27
9.6	AVOIDANCE, REMEDIAL & MITIGATION MEASURES	9-49
9.7	PREDICTED IMPACTS (RESIDUAL IMPACTS).....	9-49
9.8	MONITORING.....	9-53
9.9	REINSTATEMENT	9-53
9.10	CUMULATIVE IMPACTS.....	9-54
9.11	DIFFICULTIES ENCOUNTERED IN COMPILING	9-54

9.12	SUMMARY	9-54
10.0	MATERIAL ASSETS - TRAFFIC AND TRANSPORTATION.....	10-1
10.1	INTRODUCTION	10-1
10.2	METHODOLOGY.....	10-1
10.3	RECEIVING ENVIRONMENT.....	10-2
10.4	CHARACTERISTICS OF THE PROPOSAL.....	10-8
10.5	POTENTIAL IMPACT (EFFECTS) OF THE PROPOSAL	10-11
10.6	REMEDIAL OR REDUCTIVE MEASURES	10-13
10.7	PREDICTED (RESIDUAL) IMPACT OF THE PROPOSAL.....	10-14
10.8	DIFFICULTIES ENCOUNTERED.....	10-19
10.9	MONITORING.....	10-19
10.10	POTENTIAL CUMULATIVE IMPACTS.....	10-20
10.11	INTERACTIONS	10-20
11.0	MATERIAL ASSETS – WASTE MANAGEMENT.....	11-1
11.1	INTRODUCTION	11-1
11.2	STUDY METHODOLOGY	11-1
11.3	EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO).....	11-5
11.4	CHARACTERISTICS OF THE PROPOSED DEVELOPMENT.....	11-5
11.5	POTENTIAL IMPACT/EFFECTS OF THE PROPOSED DEVELOPMENT.....	11-5
11.1	OPERATIONAL PHASE	11-7
11.6	AVOIDANCE, REMEDIAL AND MITIGATION MEASURES	11-8
11.7	PREDICTED RESIDUAL IMPACTS	11-12
11.8	CUMULATIVE IMPACTS.....	11-12
11.9	MONITORING.....	11-13
11.10	SUMMARY OF MITIGATION & MONITORING.....	11-13
11.11	INTERACTIONS	11-14
11.12	REINSTATEMENT.....	11-14
11.13	REFERENCES AND SOURCES.....	11-14
12.0	MATERIAL ASSETS - UTILITIES.....	12-1
12.1	INTRODUCTION	12-1
12.2	METHODOLOGY.....	12-1
12.3	EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO).....	12-3
12.4	CHARACTERISTICS OF THE PROPOSED DEVELOPMENT	12-7
12.5	POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT	12-10
12.6	MITIGATION MEASURES.....	12-13

12.7	CUMULATIVE IMPACTS.....	12-15
12.8	PREDICTED (RESIDUAL) IMPACTS OF THE PROPOSED DEVELOPMENT	12-16
12.9	MONITORING.....	12-17
12.10	REINSTATEMENT.....	12-18
12.11	INTERACTIONS	12-18
12.12	DIFFICULTIES ENCOUNTERED IN COMPILING.....	12-18
13.0	CULTURAL HERITAGE – ARCHAEOLOGY	13-1
13.1	INTRODUCTION	13-1
13.2	LEGISLATION AND GUIDELINES.....	13-1
13.3	CONSULTATION.....	13-1
13.4	DEFINITIONS.....	13-2
13.5	METHODOLOGY.....	13-2
13.6	IMPACT/EFFECT DEFINITIONS.....	13-4
13.7	RECEIVING ENVIRONMENT: ARCHAEOLOGICAL AND CULTURAL HERITAGE.....	13-5
13.8	CHARACTERISTICS OF THE PROPOSED DEVELOPMENT	13-20
13.9	POTENTIAL IMPACT (EFFECTS) OF THE PROPOSED DEVELOPMENT	13-20
13.10	CUMULATIVE EFFECTS/IMPACTS	13-20
13.11	MITIGATION MEASURES AND MONITORING.....	13-21
13.12	RESIDUAL IMPACTS.....	13-21
13.13	MONITORING.....	13-21
13.14	REINSTATEMENT.....	13-21
13.15	INTERACTIONS	13-21
13.16	DIFFICULTIES ENCOUNTERED IN COMPILING.....	13-22
13.17	REFERENCES	13-22
14.0	CULTURAL HERITAGE – ARCHITECTURAL HERITAGE	14-1
14.1	INTRODUCTION	14-1
14.2	LEGAL AND PLANNING FRAMEWORK	14-2
14.3	METHODOLOGY.....	14-3
14.4	RECEIVING ENVIRONMENT (BASELINE SCENARIO)	14-6
14.5	CHARACTERISTICS OF THE PROPOSED DEVELOPMENT	14-21
14.6	POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT	14-22
14.7	MITIGATION MEASURES.....	14-26
14.8	RESIDUAL IMPACTS.....	14-27
14.9	MONITORING.....	14-28
14.10	REINSTATEMENT.....	14-28

14.11 INTERACTIONS14-28

14.12 DIFFICULTIES ENCOUNTERED IN COMPILING14-28

14.13 REFERENCES14-29

15.0 RISK MANAGEMENT FOR MAJOR ACCIDENTS AND/OR DISASTERS15-1

15.1 INTRODUCTION15-1

15.2 STUDY METHODOLOGY15-1

15.3 RECEIVING ENVIRONMENT.....15-3

15.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT15-4

15.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT15-4

15.6 MITIGATION MEASURES.....15-5

15.7 PREDICTED IMPACTS - RISK OF MAJOR ACCIDENTS AND/OR DISASTERS15-9

15.8 INTERACTIONS15-10

15.9 RESIDUAL IMPACTS15-10

15.10 CUMULATIVE IMPACTS.....15-10

16.0 INTERACTIONS OF THE FORGOING16-1

16.1 INTRODUCTION16-1

16.2 INTERACTIONS16-1

16.3 SUMMARY16-10

17.0 SUMMARY OF EIA MITIGATION AND MONITORING MEASURES17-1

17.1 INTRODUCTION17-1

17.2 MITIGATION STRATEGIES17-1

17.3 DESCRIPTION OF THE PROJECT AND ALTERNATIVES17-2

17.4 POPULATION AND HUMAN HEALTH.....17-2

17.5 BIODIVERSITY17-3

17.6 LAND AND SOILS17-7

17.7 WATER, HYDROLOGY, HYDROGEOLOGY17-13

17.8 AIR QUALITY AND CLIMATE17-15

17.9 NOISE AND VIBRATION.....17-18

17.10 MONITORING.....17-21

17.11 LANDSCAPE AND VISUAL.....17-23

17.12 MATERIAL ASSETS – TRAFFIC AND TRANSPORTATION17-23

17.13 MATERIAL ASSETS – WASTE MANAGEMENT17-24

11.14 MONITORING.....17-28

17.14 MATERIAL ASSETS – UTILITIES.....17-28

17.15 CULTURAL HERITAGE – ARCHAEOLOGY.....17-31

17.16	CULTURAL HERITAGE – ARCHITECTURAL HERITAGE.....	17-31
17.17	RISK MANAGEMENT FOR MAJOR ACCIDENTS.....	17-32

LIST OF FIGURES

Figure 1.1	– Chart showing typical classifications of the significance of impacts/effects.....	1-18
Figure 2.1	– Site Location Context	2-2
Figure 2.2	– Site Location	2-2
Figure 2.3	– Adjacent Uses	2-4
Figure 2.4	– Layout of Project Site	2-9
Figure 2.5	– Overall Site Plan Source: Bucholz McEvoy Architects.....	2-10
Figure 2.6	– Main Residential Area 01	2-11
Figure 2.7	– Main Residential Area 02	2-12
Figure 2.8	– Location of Community Hub/ Library Building	2-13
Figure 2.9	– Emmet Road Frontage	2-14
Figure 2.10	– Location of Block C.....	2-14
Figure 2.11	– Location of Non-Residential Uses	2-15
Figure 2.12	– Location of Main Public Open Space Areas.....	2-16
Figure 2.13	– Play Areas Age Classifications and Types Overview.....	2-17
Figure 2.14	– Emmet Place (with key plan location insert)	2-17
Figure 2.15	– Goldenbridge Place (with key plan location insert)	2-18
Figure 2.16	– Richmond Place (with key plan location insert).....	2-18
Figure 2.17	– Existing Inchicore Community Sports Centre (with key plan location insert)	2-19
Figure 2.18	– Communal open space (Please refer to BSLA material for layout)	2-19
Figure 2.19	– Location of Boundary Wall	2-20
Figure 2.20	– Estimated Bulk Excavation Volumes.....	2-26
Figure 2.21	– Proposed Phasing	2-34
Figure 2.22	– Alternative no. 1.....	2-40
Figure 2.23	– Alternative no. 2.....	2-41
Figure 2.24	– Alternative no. 3.....	2-43
Figure 2.25	– Alternative no. 4 Proposed Development.....	2-44
Figure 3.1	– Adjacent Uses	3-3

Figure 3.2 – Unemployment during Q2 2018-2022	3-4
Figure 3.3 – Study Area in Electoral Divisions	3-5
Figure 3.4 – Land Use Zoning Map (Dublin City Development Plan 2016-2022), showing subject site in orange	3-10
Figure 3.5 – Land Use Zoning Map (Dublin City Draft Development Plan 2022-2028), showing subject site in orange	3-10
Figure 3.6 – Land Use Zoning Matrix (Dublin City Development Plan 2016-2022)	3-10
Figure 3.7 – Land Use Zoning Matrix (Dublin City Draft Development Plan 2022-2028).....	3-11
Figure 3.8 – Existing Community Facilities within the catchment area of 1.5km	3-12
Figure 3.9 – Yearly housing completions for the State (ESRI Quarterly Commentary Spring 2022).....	3-13
Figure 3.10 – Changes in population and housing stock for Ireland, 1991-2016.....	3-14
Figure 3.11 – Number of households with more persons than rooms.....	3-14
Figure 4.1 – Site location.	4-13
Figure 4.2 – European sites within 15km of the Site of the Proposed Development Site.	4-18
Figure 4.3 – Proposed Natural Heritage Areas within 15km of the Proposed Development Site.	4-19
Figure 4.4 – Otter sign distribution on the surveyed reaches of the Camac and Poddle rivers	4-22
Figure 4.5 – Otter records from the National Biodiversity Data Centre in the vicinity of the Proposed Development Site.	4-22
Figure 4.6 – Large Area of improved amenity grassland at the Site. Image taken 20.06.2022.	4-26
Figure 4.7 – Stone wall and other stonework (BL1) habitat at the south of the Site	4-26
Figure 4.8 – Butterfly Bush at the Site of the Proposed Development. Image taken 18.05.2021.	4-27
Figure 4.9 – Habitat map of the Site of the Proposed Development.	4-28
Figure 4.10 – Bat activity map	4-30
Figure 4.11 – Bat activity map at the Site on 14/09/2021.....	4-32
Figure 4.12 – Proposed Development location showing buildings to be demolished	4-39
Figure 5.1 – Regional Site Location	5-4
Figure 5.2 – Area of Geological Interest.....	5-5
Figure 5.3 – Approximate Location of the proposed site (red line) on 1837-1842 6 Inch OS Map	5-5
Figure 5.4 – Approximate site boundary (red line) on the 2013-2018 aerial image	5-6
Figure 5.5 – Teagasc Topsoils – location of site and watermain upgrades shown by red star.....	5-7
Figure 5.6 – Local Bedrock Geology – location of site and watermain upgrades shown by red star.....	5-8
Figure 5.7 – Aquifer Vulnerability – location of site and watermain upgrades shown by red star	5-9
Figure 5.8 – Wells and Springs – location of site and watermain upgrades shown by red star.....	5-10
Figure 5.9 – Conceptual Site Model (CSM) based on existing site conditions.....	5-13

Figure 5.10 – Aerial image of the site	5-16
Figure 5.11 – Proposed Site Layout	5-17
Figure 5.12 – Proposed Watermain Upgrade	5-18
Figure 6.1 - Aerial Image Overview (Google Earth)	6-5
Figure 6.2 - Dublin City Water Catchments (GDSDS)	6-6
Figure 6.3 - Groundwater Vulnerability Mapping (GSI)	6-7
Figure 6.4 - DCC SSFRA Excerpt	6-8
Figure 6.5 - Dublin Pluvial Study Mapping	6-9
Figure 7.1 – Site specific baseline air quality monitoring location A1	7-10
Figure 7.2 – NO ₂ < 28 µg/m ³	7-10
Figure 7.3 – PM ₁₀ <12 µg/m ³	7-11
Figure 7.4 – PM _{2.5} 8-10 µg/m ³	7-11
Figure 7.5 – Windrose for Dublin Airport	7-13
Figure 7.6 – Construction Phase Monitoring Locations.....	7-19
Figure 8.1 – Baseline Noise & Vibration Monitoring Locations	8-5
Figure 8.2 – EPA Round 3 LUAS Noise Lden	8-8
Figure 8.3 – EPA Round 3 LUAS Noise Lnight	8-9
Figure 8.4 – EPA Round 3 Road Noise Lden.....	8-9
Figure 8.5 – EPA Round 3 Road Noise Lnight	8-10
Figure 8.6 – Construction Phase Noise & Vibration Monitoring Locations.....	8-20
Figure 9.1 – ‘Chart showing typical classifications of the significance of impacts’	9-5
Figure 9.2 – Ordnance Survey 6 inch map from the mid-19 th century.....	9-8
Figure 9.3 – Ordnance Survey 25 inch map from the early 20 th century (showing main development area)	9-9
Figure 9.4 – Aerial photograph from 2000 (showing main application area).....	9-9
Figure 9.5 – Aerial photograph from 2000.....	9-10
Figure 9.6 – The existing site frontage to Emmet Road	9-11
Figure 9.7 – Site Location	9-12
Figure 9.8 – The frontage to St Vincent Street West, with the site to the right	9-13
Figure 9.9 – The Richmond Barracks frontage to Patriot’s Path opposite the site.....	9-13
Figure 9.10 – Richmond Barracks and the Thornton Heights development fronting Patriot’s Path	9-14
Figure 9.11 – The view along Thomas Davis Street towards the site	9-14
Figure 9.12 – The residential buildings facing the site across St Vincent Street West	9-15

Figure 9.13 – The view along Emmet Crescent towards the site	9-15
Figure 9.14 – The view along Goldenbridge Terrace towards the site	9-16
Figure 9.15 – The view east along Emmet Road from Inchicore ‘village centre’ towards the site	9-16
Figure 9.16 – The view west along Bulfin Road towards the site	9-17
Figure 9.17 – St Michael’s Church alongside the site on Emmet Road	9-18
Figure 9.18 – A view from the Grand Canal towards the site, with Goldenbridge Cemetery to the right beyond the canal.....	9-18
Figure 9.19 – Key receptors of potential townscape and visual change	9-19
Figure 9.20 – DCDP 2016 map showing ‘Key Development Principles’ for SDRA 9 St Michael’s Estate	9-21
Figure 9.21 – Draft DCDP 2022 Guiding Principles Map for Emmet Road Regeneration Site	9-26
Figure 9.22 – Proposed distribution of uses, urban grain, open space and routes of movement	9-28
Figure 9.23 – The frontage of the proposed mixed use building to Emmet Road and St Vincent Street West	9-29
Figure 9.24 – The combined frontage of the community hub/library and the mixed use building to Emmet Road, showing the civic character of the community building	9-30
Figure 9.25 – The proposed creche building opposite Richmond Barracks	9-30
Figure 9.26 – The residential buildings fronting St Vincent Street West.	9-31
Figure 9.27 – Proposed Emmet Place	9-32
Figure 9.28 & 9.29 – Proposed Richmond Place and Goldenbridge Place	9-32
Figure 9.30 – Viewpoints for visual effects assessment.....	9-34
Figure 9.31 – Viewpoints focussed on the northern part of the site where the proposed development interfaces with Emmet Road and the Inchicore village centre/urban core.....	9-35
Figure 9.32 – a & b – Viewpoints from the area of mixed character and quality to the west of the site, where the site interfaces with St Vincent Street West.....	9-39
Figure 9.33 – c – A view west from the site along Emmet Crescent towards St Vincent’s Convent church, also showing the poor quality of the built frontage to St Vincent Street West opposite the site	9-39
Figure 9.34 – Viewpoints from east of the site, showing the interface with Patriot’s Path and Richmond Barracks, and the effects on the extensive 20 th century residential area to the east.....	9-43
Figure 9.35 – A view from Connolly Avenue showing a new apartment development on the south side of the Grand Canal beside Goldenbridge Luas stop.....	9-44
Figure 9.36 – A view along the Grand Canal (from a similar position to Viewpoint 21) showing the diversity of character in the evolving townscape	9-45
Figure 9.37 – The viewpoints to the south of the site including Nos. 12 and 21-24 which represent the Grand Canal CA	9-46
Figure 9.38 – A view along the footpath between Goldenbridge Cemetery and Thornton Heights	9-46
Figure 10.1 – Traffic Survey Locations	10-3
Figure 10.2 – Existing Cycle Network as per GDA Cycle Network Plan Survey	10-5
Figure 10.3 – Proposed Cycle Network as per GDA Cycle Network Plan	10-6

Figure 11.1 – The Waste Hierarchy (European Commission).....	11-4
Figure 11.2 – The Circular Economy	11-4
Figure 12.1 – Site Location-to be updated with final redline boundary	12-2
Figure 12.2 – Irish Water Record Drawings	12-3
Figure 12.3 – Existing ESB Networks Local Services Map	12-5
Figure 12.4 – Existing Gas Local Services Map.....	12-6
Figure 12.5 – Existing Telecoms Local Services Map.....	12-7
Figure 13.1 – Site location showing nearby archaeological heritage	13-5
Figure 13.2 – Location of site investigations (those revealing 19th century remains are marked in red)	13-10
Figure 13.3 – Extract from Rocque’s map of 1757 (showing the approximate location of the proposed development area).....	13-12
Figure 13.4 – Extract from Taylor’s map of 1816 (showing the approximate location of the proposed development area	13-13
Figure 13.5 – Extract from the First Edition OS map of 1843 showing the proposed development area	13-13
Figure 13.6 – Extract from OS map of 1871-5 (showing the proposed development area).....	13-14
Figure 13.7 – Extract from OS map of 1889 showing the proposed development area	13-14
Figure 13.8 – Extract from OS map of 1947 showing the proposed development area	13-15
Figure 13.9 – Extracts from Google Earth imagery of the proposed development area (2005-2020)	13-17
Figure 13.10 – DCIHR Sites within the Study Area	13-18
Figure 14.1 – Site Location Map.....	14-6
Figure 14.2 – OSI City of Dublin Map 1889.....	14-7
Figure 14.3 – Richmond Barracks extents (1879)	14-8
Figure 14.4 – Richmond Barracks extents (1879) Soldier’s Parade Ground	14-8
Figure 14.5 – Richmond Barracks extents (1879)	14-8
Figure 14.6 – Image taken over the site of the former barracks c.1980.....	14-9
Figure 14.7 – Image taken of the western elevation of Gymnasium building in 2016.....	14-10
Figure 14.8 – Image taken 2106 of the eastern elevation of Gymnasium building	14-11
Figure 14.9 – Remaining section of the Barracks boundary wall at the northwest corner of the site	14-12
Figure 14.10 – Extract from Rocque’s map of 1757 showing the approximate location of the proposed development area	14-13
Figure 14.11 – Extract from Taylor’s map of 1816 showing the approximate location of the proposed development area	14-13
Figure 14.12 – Extract from the First Edition OS map of 1843 showing the proposed development area	14-14
Figure 14.13 – Extract from OS map of 1864 showing the proposed development area	14-14

Figure 14.14 – Extract from OS map of 1872 showing the proposed development area	14-15
Figure 14.15 – Extract from OS map of 1889 showing the proposed development area	14-15
Figure 14.16 – Extract from OS map of 1897 showing the proposed development area	14-16
Figure 14.17 – Extract from OS map of 1906-09 showing the proposed development area	14-16
Figure 14.18 – Extract from OS map of 1911 showing the proposed development area	14-17
Figure 14.19 – Extract from OS map of 1935 showing the proposed development area	14-17
Figure 14.20 – Extract from OS map of 1906-09 showing the proposed development area	14-18
Figure 14.21 – Extract from OS map of 1966 showing the proposed development area	14-18
Figure 14.22 – Map indicating Structures of Cultural and Heritage significance within 100m of site.....	14-20
Figure 14.23 – Record of Structures of Cultural and Heritage significance within 100m of site	14-21
Figure 14.24 – Artists Impression of space between former Barracks Buildings and adjacent 7-storey building	14-23
Figure 14.25 – Artists Impression of setback of development and St. Michael's Church	14-23
Figure 14.26 – Artists Impression of Proposed Works to Wall along St. Vincent's Street	14-24
Figure 14.27 – Artists Impression of development next to Goldenbridge Cemetery	14-24
Figure 14.28 – Summary of Impacts on Record of Protected Structures and Buildings Listed on the NIAH.....	14-25
Figure 17.1 – Construction Phase Monitoring Locations.....	17-18
Figure 17.2 – Construction Phase Noise & Vibration Monitoring Locations.....	17-22

LIST OF TABLES

Table 1.1 – EIA Guidelines Consulted as Part of the Preparation of this EIAR	1-4
Table 1.2 – Consultees.....	1-7
Table 1.3 – Structure of this EIAR	1-14
Table 1.4 – Methodology Employed to Evaluate Environmental Topic.....	1-15
Table 1.5 – Description of Effects.....	1-16
Table 1.6 – EIAR List of Competent Experts.....	1-19
Table 2.1 – Summary of Key Site/Development Statistics	2-7
Table 2.2 – Overall Dwelling Mix	2-8
Table 2.3 – Summary of Proposed Cultural/Community and Commercial Elements.....	2-8
Table 2.4 – Predicted Construction Waste Generation	2-27
Table 2.5 – Predicted Demolition Waste Generation	2-27

Table 2.6 – Calculated domestic waste composition Residential Development	2-28
Table 2.7 – Non-Domestic waste generation per week.....	2-28
Table 2.8 – Summary Table of Comparison of Main Environmental Effects.....	2-46
Table 3.1 – Study Area ED Population 2016 & 2022	3-6
Table 3.2 – Population at State, Regional, County and Local Level, 2006- 2016.....	3-6
Table 3.3 – Age Profile at State, County and Local Level, 2006-2011-2016	3-7
Table 3.4 – Persons by Socio-Economic Group, 2016	3-8
Table 3.5 – Persons by Educational Attainment, 2016	3-8
Table 4.1 – Summary of ecological surveys carried out at the Site.	4-5
Table 4.2 – Description of values for ecological resources based on geographic hierarchy of importance (NRA, 2009).	4-8
Table 4.3 – Definition of Quality of Effects	4-10
Table 4.4 – Definition of Significance of Effects	4-10
Table 4.5 – Definition of Duration of Effects.....	4-11
Table 4.6 – Designated sites within the zone of influence (15km)	4-14
Table 4.7 – Invasive plant species within the 2km (O13G) grid square	4-20
Table 4.8 – Terrestrial mammal species within the 2km (O13G) grid square	4-21
Table 4.9 – Records of bats within the 2km (O13G) grid square with the habitat suitability index for each species in the locality	4-23
Table 4.10 – Red and amber listed bird species recorded within grid square O13G.....	4-23
Table 4.11 – Threatened invertebrate species listed as 'vulnerable' or 'endangered' within the 2km (O13G) grid square. The records are dated within the last 20 years and are provided by the NBDC.	4-24
Table 4.12 – Bat Results Summary Data from three Survey Dates – July 23 rd 2020, July 25 th 2020 and July 7 th 2022	4-30
Table 4.13 – Summary of Bat activity recorded at the Site on 14 th September 2021.	4-31
Table 4.14 – Bird species recorded at the Site of the Proposed Development.....	4-33
Table 4.15 – Evaluation of designated sites, habitats and fauna recorded within the surrounding area.	4-36
Table 4.16 – Summary of peak counts of all relevant SCI species across the survey period, and respective 1% national and international population estimates.....	4-43
Table 4.17 – Summary of potential impacts on KER(s), mitigation proposed and residual impacts.....	4-54
Table 5.1 – Adjacent Land Uses.....	5-4
Table 5.2 – Sequence of Strata	5-11
Table 5.3 – Conceptual Site Model (CSM) Pollutant Linkages Geology and Groundwater	5-13
Table 5.4 – Conceptual Site Model (CSM) Pollutant Linkages Geology and Groundwater	5-15
Table 5.5 – Development Site and Watermain Upgrade Activities Summary	5-18

Table 5.6 – Estimated Bulk Excavation Volumes	5-20
Table 5.7 – Soil Waste Categories	5-25
Table 5.8 – Soil Classification Results	5-26
Table 5.9 – Detailed Impact Assessment – Construction Phase	5-29
Table 7.1 – Air Quality Standards Regulations 2011 (based on EU Council Directive 2008/50/EC)	7-2
Table 7.2 – World Health Organisation Air Quality Guidelines (non-mandatory)	7-3
Table 7.3 – EPA 2020 Assessment Zone A Classification	7-3
Table 7.4 – Assessment criteria for the impact of duct emissions from construction activities with standard mitigation in place (TII 2011)	7-4
Table 7.5 – Summary of the 2019 Air Quality data obtained from Zone A area	7-9
Table 7.6 – Results of passive diffusion tube monitoring at Emmet Road development site	7-9
Table 7.7 – Meteorological Data for Dublin Airport 2011-2021	7-12
Table 7.8 – Summary of Construction Phase Likely Significant Effects with Mitigation	7-16
Table 7.9 – Summary of Operational Phase Likely Significant Effects with Mitigation	7-18
Table 8.1 – Threshold of Potential Significant Effect at Dwelling	8-2
Table 8.2 – Transient vibration guide values for cosmetic damage	8-3
Table 8.3 – Guidance on the effect of construction vibration levels on humans	8-3
Table 8.4 – Recommended Vibration Criteria During Construction Phase	8-3
Table 8.5 – Baseline noise measurement locations	8-5
Table 8.6 – Location N1 Northeastern site boundary opposite houses along St. Vincent’s Rd West.....	8-6
Table 8.7 – Location N2 Northeastern site boundary opposite St Michael’s church	8-6
Table 8.8 – Location N3 Eastern site boundary opposite HSE facility / Hollybrook Lodge Residential Units	8-6
Table 8.9 – Location N4 Western site boundary opposite flat complex	8-7
Table 8.10 – Location N5 Southeastern site boundary adjacent Thornton Heights houses	8-7
Table 8.11 – Location N6 Southwestern site boundary adjacent Our Lady of Lourdes School	8-7
Table 8.12 – Predicted construction noise predictions associated with Site Clearance	8-17
Table 8.13 – Foundation Pour Noise Sources.....	8-17
Table 8.14 – General Construction Activities Noise Sources	8-17
Table 8.15 – Summary of Construction Phase Likely Significant Effects.....	8-18
Table 8.16 – Summary of Operational Phase Residual Effects	8-19
Table 9.1 – Categories of Townscape Sensitivity.....	9-2
Table 9.2 – Categories of Townscape Change	9-3
Table 9.3 – Guide to Classification of Significance of Townscape and Visual Effects.....	9-4

Table 9.4 – Categories of Viewpoint Sensitivity	9-6
Table 9.5 – Categories of Magnitude of Visual Change	9-6
Table 9.6 – Summary of Visual Effects Assessment.....	9-52
Table 10.1 – Urban Road Capacities	10-4
Table 10.2 – Base Year Link RFC Values for Local Network Base Year Link RFC Values for Local Network	10-4
Table 10.3 – Background Traffic Growth Factors.....	10-4
Table 10.4 – Local Bus Services Peak Hour Capacity	10-8
Table 10.5 – Proposed Development Estimated Trip Generation.....	10-11
Table 10.6 – Potential Operation Stage Impact in the Absence of Mitigation	10-12
Table 10.7 – 2024 Do Something Link RFC Values.....	10-15
Table 10.8 – Junction 2 – 2024 Peak Hour Do Nothing Analysis Results.....	10-16
Table 10.9 – Junction 2 – 2024 Peak Hour Do Something Analysis Results.....	10-16
Table 10.10 – Junction 4 – 2024 Peak Hour Do Nothing Analysis Results	10-16
Table 10.11 – Junction 4 – 2024 Peak Hour Do Something Analysis Results.....	10-16
Table 10.12 – 2039 Do Something Scenario Link RFC Values	10-17
Table 10.13 – Junction 2 – 2039 Peak Hour Do Nothing Analysis Results	10-17
Table 10.14 – Junction 2 – 2039 Peak Hour Do Something Analysis Results.....	10-17
Table 10.15 – Junction 4 – 2039 Peak Hour Do Nothing Analysis Results	10-18
Table 10.16 – Junction 4 – 2039 Peak Hour Do Something Analysis Results.....	10-18
Table 10.17 – Residual Operation Stage Impact with Mitigation.....	10-18
Table 10.18 – Proposed Development Target Modal Share	10-19
Table 11.1 – Sequence of Construction Works	11-6
Table 11.2 – Typical Construction Waste Composition.....	11-6
Table 11.3 – Predicted Construction Waste Generation	11-6
Table 11.4 – Predicted Demolition Waste Generation	11-7
Table 11.5 – Calculated domestic waste composition Residential Development	11-7
Table 11.6 – Non-Domestic waste generation per week.....	11-7
Table 11.7 – Soil Classification Results	11-10
Table 11.8 – Summary of Construction Phase Likely Significant Effects with Mitigation.....	11-12
Table 11.9 – Summary of Operational Phase Likely Significant Effects with Mitigation	11-12
Table 11.10 – Summary of Construction Phase Mitigation and Monitoring	11-13
Table 11.11 – Summary of Operational Phase Mitigation and Monitoring.....	11-14

Table 13.1 – Significance of Effects	13-4
Table 13.2 – Placename Analysis	13-17
Table 13.3 – DCIHR Sites within the Study Area	13-18
Table 14.1 – Definition of levels of significance.....	14-5
Table 15.1 – Risk Classification.....	15-2
Table 15.2 – Risk Likelihood.....	15-3
Table 15.3 – Risk Matrix	15-3
Table 15.4 – Strategy for tackling potential risks.....	15-7
Table 15.5 – Risk Evaluation	15-10
Table 16.1 – Matrix of Summary of interactions between the environmental factors.....	16-2
Table 17.1 – Soil Waste Categories	17-9
Table 17.2 – Soil Classification Results	17-10
Table 17.3 – Soil Classification Results	17-26
Table 17.4 – Strategy for tackling potential risks.....	17-34

LIST OF ABBREVIATIONS

AA	Appropriate Assessment	GDP	Gross Domestic Product
ABP	An Bord Pleanála	GSI	Geology Survey Ireland
CDP	County Development Plan	IAA	Irish Aviation Association
CEMP	Construction Environmental Management Plan	IEEM	Institute of Ecology and Environmental Management
CA	Competent Authority (An Bord Pleanála)	IFI	Inland Fisheries Ireland
CSO	Central Statistics Office	LAP	Local Area Plan
DAHG	Department of Arts, Heritage and the Gaeltacht	NHA/pNHA	Natural Heritage Area / proposed Natural Heritage Area
DCC	Dublin City Council	NIAH	National Archive of Architectural Heritage
DCENR	Department of Communications, Energy and Natural Resources	NPWS	National Parks and Wildlife Service
DEHLG	Department of Housing, Planning and Local Government	NRA	National Roads Authority
EIA	Environmental Impact Assessment	NPF	National Planning Framework
EIAR	Environmental Impact Assessment Report	OPW	Office of Public Works
EMP	Environmental Management Plan	RMP	Record of Monuments and Places
EPA	Environmental Protection Agency	RSES	Regional Spatial Economic Strategy
ESRI	Economic and Social Research Institute	RPS	Record of Protected Structures
		SAC	Special Area of Conservation

SDRA	Strategic Development Regeneration Area	TMP	Traffic Management Plan
SMR	Sites and Monuments Record	WFD	Water Framework Directive
SPA	Special Protection Area		
SUDS	Sustainable Drainage System		

GLOSSARY OF TERMS¹

Alternatives A description of other options that may have been considered during the conception of a project; these include alternative locations, alternative designs and alternative processes.

Baseline Scenario The current state of environmental characteristics – including any evident trends in its status.

Competent Authority (CA) The term ‘competent authority’ means the Minister or public authority to which an EIAR is required to be submitted, i.e. the authority charged with examining an EIAR with a view to issuing a consent to develop or operate.

Development A project involving new works [including alteration and/or demolition] or altered patterns of activity.

‘Do-nothing’ Scenario The situation or environment which would exist if a proposed, development, project or process were not carried out. This scenario needs to take account of the continuation or change of current management regimes, as well as the continuation or change of trends currently evident in the environment.

Effect / Impact A change resulting from the implementation of a project.

Environmental Impact Assessment – EIA The process of examining the anticipated environmental effects of a proposed project – from consideration of environmental aspects at design stage, through consultation and preparation of an Environmental Impact Assessment Report (EIAR), evaluation of the EIAR by a competent authority, and the subsequent decision as to whether the project should be permitted to proceed, encompassing public response to that decision.

Environmental Impact Assessment Report – EIAR A report or statement of the effects, if any, that the proposed project, if carried out, would have on the environment. EPA The Environmental Protection Agency.

Impact / Effect A change resulting from the implementation of a project

Impact Avoidance The modification of project decisions (about site location or design, for example) having regard to predictions about potentially significant environmental effects.

Infrastructure The basic structure, framework or system which supports the operation of a project, for example roads and sewers, which are necessary to support development projects.

Land Use The human activities which take place within a given area of space.

Likely Effects (or Likely Impacts) The effects that are specifically predicted to take place – based on an understanding of the interaction of the proposed project and the receiving environment. (See also Potential Effects and Residual Effects.)

Methodology The specific approach or techniques used to analyse impacts or describe environments.

Mitigation Measures: Measures designed to avoid, prevent or reduce impacts. These measures can mitigate impacts: \ by Avoidance When no impact is caused (often through consideration of alternatives). \ by Prevention When a potential impact is prevented by a measure to avoid the possibility of the impact occurring. \ by Reduction When an impact is lessened.

¹ Selected – From Guidelines on the information to be contained in Environmental Impact Assessment Reports – EPA, May 2022

Monitoring *The observation, measurement and evaluation of environmental data to follow changes over a period of time, to assess the efficiency of control measures and to record any unforeseen effects in order to be able to undertake appropriate remedial action. This is typically a repetitive and continued process carried out during construction, operation or decommissioning of a project.*

Pathway *The route by which an effect is conveyed between a source and a receptor.*

Planning Application Report *Documentation that accompanies the planning application which describes the conformity of the proposal with relevant legislation and planning matters – such as the County, City or Local Area Plans – and sectoral policies, as well as social and economic activity.*

Pollution *Any release to the environment which has a subsequent adverse effect on the environment or man.*

Potential Effect/ Impact *The effect / impact that would occur without mitigation.*

Processes *The activities which take place within a project.*

Project *For the purposes of the Guidelines, the term project is used to encompass all of the various forms of development, works and activity which are subject to EIA requirements, as set out in the relevant legislation and as understood by the Directive.*

Sensitivity *The potential of a receptor to be significantly affected. Significance (of impact) The importance of the outcome of the impact (or the consequence of change) for the receiving environment. Source The activity or place from which an effect originates.*

DOCUMENT CONTROL SHEET

Client:	Dublin City Council
Project Title:	Residential and Mixed Use Development Emmet Road
Document Title:	Environmental Impact Assessment Report Volume II
Document No:	20104

Rev.	Status	Author(s)	Reviewed By	Approved By	Issue Date
DV1	Draft	EIAR TEAM	RK	RK	15-9-2022
Final	FINAL	EIAR TEAM	RK	JS	3-10-2022

1.0 INTRODUCTION AND METHODOLOGY

This EIAR has been prepared to accompany an application for approval to An Bord Pleanála for the construction of a mixed-use development at Emmet Road, Inchicore, Dublin 8. under Section 175 of the Planning & Development Act 2000 as amended.

In summary, the development will comprise 578 no. apartments, community facilities (including community hub/library, creche, retail/retail services and café units), a supermarket, a public plaza fronting onto Emmet Road and the installation of a new watermain c 200m in length along Emmet Road to the junction with Tyrconnell Road/Grattan Crescent. The proposal includes works to a protected structure (8705 - Richmond/Keogh Barracks, relating to works to rubble stone boundary walls). Chapter 2 provides a full description of the project.

The central purpose of the Environmental Impact Assessment Report (EIAR) is to undertake an appraisal of the effects of the proposed development (project) on the environment, and to document this process and describe the likely significant effects on the environment (if any). The EIAR is then submitted to the competent/ consent authority to enable it to assess the likely significant effects of the project on the environment.

A full description of the proposed development lands together with a description of the proposed development is provided in Chapter 2 of this EIAR document.

This EIAR document has been prepared in accordance with Directive 2011/92/EU of the European Parliament and Council of the 13th December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) as amended by Directive 2014/52/EU of the European Parliament and Council of the 16th April 2014 (**'the EIA Directives'**), as well as relevant national implementing legislation, i.e. Part X of the Planning and Development Act 2000, as amended (**'the 2000 Act'**), and Part 10 of the Planning and Development Regulations 2001, as amended, (**'the 2001 Regulations'**). A description of the methodological approach to the preparation of this EIAR is provided in the following sections of this chapter.

1.1 EIA LEGISLATION, DEFINITION OF EIA AND EIAR

Certain public and private projects that are likely to have significant effects on the environment are required to undergo an environmental impact assessment (EIA) in accordance with the EIA Directives. The purpose of the EIA Directives is to ensure that projects likely to have significant effects on the environment are subject to a comprehensive and systematic assessment of environmental effects prior to development consent being given.

Directive 2014/52/EU defines '*environmental impact assessment*' as a process, which includes the responsibility of the developer to prepare an Environmental Impact Assessment Report (EIAR), and the responsibility of the competent authority to provide reasoned conclusions following the examination of the EIAR and other relevant information.

Article 1(2)(g) of Directive 2011/92/EU, as amended by the 2014 Directive states that "*environmental impact assessment*" means a process consisting of:

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

A definition of “*environmental impact assessment*” is also contained under Section 171A of the 2000 Act, as amended as follows:

‘environmental impact assessment’ means a process—

(a) consisting of—

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

(b) which includes—

(i) an examination, analysis and evaluation, carried out by the planning authority or the Board, as the case may be, in accordance with this Part and regulations made thereunder, that identifies, describes and assesses, in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of the proposed development on the following:

- (I) population and human health;*
- (II) biodiversity, with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive;*
- (III) land, soil, water, air and climate;*
- (IV) material assets, cultural heritage and the landscape;*
- (V) the interaction between the factors mentioned in clauses (I) to (IV),*

and

(ii) as regards the factors mentioned in subparagraph (i)(I) to (V), such examination, analysis and evaluation of the expected direct and indirect significant effects on the environment derived from the vulnerability of the proposed development to risks of major accidents or disasters, or both major accidents and disasters, that are relevant to that development;

The amended Directive (Directive 2014/52/EU) uses the term environmental impact assessment report (EIAR) rather than environmental impact statement (EIS). Where current national guidelines and regulations refer to an environmental impact statement or an EIS, this can be taken to be the same as an environmental impact assessment report (EIAR).

A definition of Environmental Impact Assessment Report (EIAR) has not been included in the revised directive. However the EPA Guidelines (2022)² (and the Planning and Development Act 2000 as amended) provide the following definition:

“A report or statement of the effects, if any, that the proposed project, if carried out, would have on the environment.”

The information to be included in an EIAR is specified in Article 5(1) and Annex IV of the EIA Directives (see section 1.7 below for more). The EIAR is prepared by the developer (in this instance Dublin City Council) and is submitted to a Competent Authority (CA) (in this instance An Bord Pleanála) as part of a consent process.

² *Guidelines on the Information to be contained in Environmental Impact Assessment Reports, Environmental Protection Agency, 2022*

The CA uses the information provided to assess the environmental effects of the project and, in the context of other considerations, to inform its decision as to whether consent should be granted. The information in the EIAR is also used by other parties to evaluate the acceptability of the project and its effects and to inform their submissions to the CA.

The EIAR presents a systematic analysis and evaluation of the potentially significant effects of a proposed project on the receiving environment. Article 3 of the amended EIA Directive prescribes a range of environmental factors which are used to organise descriptions of the environment, and which must be addressed in the EIAR:

"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; the interaction between the factors referred to in points (a) to (d)."*

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.

Where significant and likely environmental effects are identified, the EIA process aims to quantify and minimise the impact development projects have on the environment through appropriate mitigation measures. The preparation of an EIAR requires site-specific considerations and the preparation of baseline assessment against which the likely impacts of a proposed development can be assessed by way of a concise, standardised and systematic methodology.

1.1.1 Purpose of This EIAR

The EPA Guidelines 2022 state that the main purpose of an EIAR *'is to identify, describe and present an assessment of the likely significant effects of a project on the environment'*. This informs the competent authority's assessment process, its decision on whether to grant consent for a project and, if granting consent, what conditions to attach. The EIAR focuses on:

- *effects that are both likely and significant; and;*
- *description of effects that are accurate and credible.*

In addition to identifying and predicting the likely predicted significant environmental impacts resulting from the proposed development, the EIAR should describe the means and extent by which they can be reduced or ameliorated, to interpret and communicate information about the likely impacts and to provide an input into the decision making and planning process.

The EIAR documents the consideration of environmental effects that influenced the evaluation of alternatives. It also documents how the selected project design incorporates mitigation measures; including impact avoidance, reduction or amelioration; to explain how significant adverse effects will be avoided.

It is intended that this EIAR will assist An Bord Pleanála, statutory consultees and the public in assessing all aspects of the application proposals.

1.1.2 Objectives of This EIAR

The EPA guidelines (2022) list the following fundamental principles to be followed when preparing an EIAR:

- Anticipating, predicting, avoiding and reducing significant effects;
- Assessing and mitigating effects;
- Maintaining objectivity;

- Ensuring clarity and quality;
- Providing relevant information to decision makers; and
- Facilitating better consultation.

The amended EIA Directive prescribes a range of environmental factors which are used to organise descriptions of the environment and the environmental impact assessment should 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 prescribed environmental factors which are:

- (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).

This EIAR documents the analysis, evaluation and assessment of the likely significant effects of the proposed mixed use development at Emmet Road, Inchicore, Dublin 8 on each of these environmental factors.

Pursuing preventative action is the most effective means by which potential negative environmental impacts can be avoided. Avoidance of impacts has been principally achieved through the consideration of alternatives and through the review of the project design in light of identified key environmental constraints. This is outlined in greater detail in Chapter 2.

The EIAR document enables the Board, as the competent authority, to reach a decision on the acceptability of the proposed development in the full knowledge of the project's likely significant impacts on the environment, if any.

Decisions are taken by competent/consent authorities through the statutory planning process which allows for public participation and consultation while receiving advice from other key stakeholders and statutory authorities with specific environmental responsibilities.

The structure, presentation and the non-technical summary of the EIAR document 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 any likely environmental impacts of projects prior to the granting of consent.

1.2 EIA GUIDELINES

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

We would also note that the pre-application discussions with the Planning Authority and An Bord Pleanála, including the Board's opinion informed the content of the EIAR.

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

Irish
<ul style="list-style-type: none"> • Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, EPA, May 2022 • Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment August 2018

- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licensing Systems - Key Issues Consultation Paper, Department of Housing, Planning, Community and Local Government, 2017.
- Circular letter PL 1/2017 - Advice on Administrative Provisions in Advance of Transposition (2017).
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DoECLG, March 2013).
- Development Management Guidelines (DoEHLG, 2007).
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003).
- Environmental Impact Assessment (EIA), Guidance for Consent Authorities Regarding Sub-Threshold Development (DoEHLG 2003).

European Union (in addition to Directives referenced above)

- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report, European Commission, 2017
- Environmental Impact Assessment of Projects Guidance on Screening (2017).
- Environmental Impact Assessment of Projects Guidance on Scoping (2017).
- Study on the Assessment of Indirect & Cumulative Impacts as well as Impact Interaction (DG Environment 2002).

The content of this Environmental Impact Assessment Report has been prepared in accordance with the provisions of Article 5(1) and Annex IV of Directive 2014/52/EU and Article 94 and Schedule 6 the 2001 Regulations as amended.

1.3 EIA PROCESS OVERVIEW

The main purpose of the EIA process is to identify, describe and assess the direct and indirect significant impacts of the proposed project on the environment, and specifically 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; the interaction between the factors referred to in points (a) to (d)."*

The EIAR presents the results of the analysis and assessment of the significant effects of the proposed development on the receiving environment undertaken by the competent experts appointed by the developer to prepare the EIAR and sets out measures to be incorporated into the project to eliminate or minimise these impacts.

Several interacting steps typify the early stages of the EIA process and include:

- Screening.
- Scoping.
- Assessing alternatives; and
- Assessing and evaluating.

Screening: Screening is the term used to describe the process for determining whether a proposed development requires an EIA. The screening exercise conducted in respect of the proposed development is set out in section 1.4 below.

Scoping: This stage firstly identifies the extent of the proposed development and associated site, which will be assessed as part of the EIA process, and secondly, it identifies the environmental issues likely to be important during the course of completing the EIA process having regard to the nature of the proposed development and the receiving environment and through consultation with statutory and non-statutory stakeholders. Scoping request letters were issued to a range of stakeholders at the commencement of this EIA process and the responses received have been considered as part of the compilation of the EIAR. The scoping process adopted for the proposed development is set out in section 1.5 below

Assessing Alternatives: This stage includes a description of the reasonable alternatives which are relevant to the project and its specific characteristics and sets out the main reasons for the chosen approach taking into account the effects of the respective alternatives on the environment. Consideration of alternatives is set out in Chapter 2 of this EIAR.

Assessing and Evaluating: The central steps of the EIA process include baseline assessment (desk study and field surveys) to determine the status of the existing environment, impact prediction and evaluation, and determining appropriate mitigation measures where necessary. This stage of the EIAR is presented in Chapters 3 to 15.

1.4 SCREENING – REQUIREMENT 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 by reference to the type and scale of the proposed development and the significance or the environmental sensitivity of the receiving baseline environment.

Article 4(1) of the EIA Directives requires as mandatory the preparation of an EIA for all development projects listed in Annex I of the Directive.

Article 4(2) of the EIA Directives provides EU Member States discretion in determining the need for an EIA on a case-by-case basis for certain classes of project listed in Annex II of the Directives having regard to the overriding consideration that projects likely to have significant effects on the environment should be subject to EIA.

Schedule 5 (Part 2) of the Planning & Development Regulations 2001 (as amended) set mandatory thresholds for each of the projects of a type listed in Annex II of the EIA Directives, which if exceeded will require such a project to be subject to an EIA.

Paragraph 10((b)(i) of Schedule 5 (Part 2) refers to Infrastructure projects comprising the construction of more than 500 dwelling units. The proposed development (project) includes 578 no. dwellings and therefore the project exceeds the 500 no. dwelling unit threshold, therefore triggering mandatory EIA. Consequently the project must be subjected to an EIA before development consent may be given.

1.5 PROJECT SCOPING AND CONSULTATION

The EPA Guidelines 2022 state that ‘*scoping*’ is a process of deciding what information should be contained in an EIAR and what methods should be used to gather and assess that information. It is defined in the EC guidance³ as:

“The process of identifying the content and extent of the information to be submitted to the Competent Authority under the EIA process.”

The EPA Guidelines 2022 note that the scope of the EIAR commonly emerges from a dialogue between some or all of the following:

“The developer and their team, including competent experts, who may propose an initial draft of the scope on the basis of their knowledge of the project, the site and the likely relevant issues

The Competent Authority (CA) who will have extensive knowledge of the context and local issues and concerns, as well as detailed knowledge of statutory requirements

³ Environmental Impact Assessment of Projects Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU)

Other Authorities, Agencies and NGOs who typically have a detailed understanding of aspects of the environment that may be affected

The Public, either individually or in groups, who are likely to have either thematically specific or area-specific concerns. Local residents are likely to be key participants for most projects.”

While provision is made to request a formal scoping opinion from An Bord Pleanála under Article 117(1) of the 2001 Regulations 2001 a scoping opinion under Article 117(1) of the 2001 Regulations was not requested. Extensive project scoping undertaken to inform the preparation of this EIA which included consultation with relevant Prescribed Authorities, relevant Departments within Dublin City Council, and public consultation, to draw on local knowledge and experience of the subject lands and Inchicore area and to identify issues of particular environmental significance.

The purpose of the scoping process was to establish aspects of the environment to be considered in the Environmental Impact Assessment Report (EIA) and in particular those sensitive aspects requiring more in-depth study. The exercise has resulted in an iterative design process, such that the proposal and design has been modified to address the scoping/consultation undertaken.

The project was also scoped with the design team based on the expertise and past experience of the EIA contributors for similar projects.

1.5.1 Scoping Request

Initial scoping by the design team was supplemented by a written request for information to a number of statutory and non-statutory consultees in May 2022 having regard to the functions of the bodies in question and the likely significant effects associated with the proposed development.

The consultees were provided with information on the site and the proposed development. The purpose of the exercise was to gather any relevant information that they may have had on the site. Further they were invited to highlight any issues that they felt should be addressed within the scope of the EIA. A copy of the letter is detailed in Appendix A (Volume III of the EIA).

Contact was made with 11 no. consultees and 2 no. responses were received from Inland Fisheries Ireland and Transport Infrastructure Ireland.

Table 1.2 – Consultees

Consultee
Department of Housing, Planning and Local Government
Department of Culture, Heritage & the Gaeltacht
Environmental Protection Agency
Inland Fisheries Ireland
Irish Water
National Transport Authority
Office of Public Works
The Heritage Council
Transport Infrastructure Ireland
Birdwatch Ireland
An Taisce

A copy of the responses received are detailed in Appendix A Volume III of the EIA.

1.5.2 Internal DCC Scoping Consultation

Extensive internal consultation has been undertaken within Dublin City Council at various stages throughout the development proposal. Consultation has been undertaken with the following Departments:

Planning Department

Planning & Property Development: Forward Planning
Transportation Planning
Environment and Transportation, Roads and Traffic
City Architects
Engineering – Structural, Mechanical and Electrical
Drainage Planning & Development Control
Public Lighting
Parks & Landscape Services
Roads & Transportation
Conservation
Archaeology

With reference to traffic and transportation, the importance of providing a sustainable level of car parking and the inclusion of cycle parking (and car sharing), through the inclusion of an integrated mobility strategy was an important element of the feedback from the Roads and Traffic Department.

The importance of providing a good public realm benefiting the surrounding communities was also emphasised.

In relation to the Planning Department, the scale, height and massing of the proposed development was considered appropriate in its context. The preference for enclosed courtyards was expressed. In this regard the design was altered to provide enclosed courtyards.

The desire for the inclusion of ground floor activity where possible (subject to levels) was outlined. The proposed development includes own door access along east west streets and other areas where the level of the site allows.

The Parks Department welcomed the SuDs proposals and using green and blue roofs. Key was to make sure that the open spaces are balanced and usable for residents and public and the provision of SuDs measures. With regard to the open space at Emmet Road, an important point was that the design was to be resilient and as robust as possible and attractive for the community – to make them as attractive and the scale of the space was noted.

With regard to the Environment/Drainage Department, Using SuDs for runoff for the roads was encouraged particularly where new developments are close to rivers (in this case the Camac River). Various SuDs measures were suggested including filter strips.

The Drainage Department welcomed the strong consideration to multifunctioning spaces and green spaces and commented that a lot of thought went into the use of SUDS

The environmental pressures on the Camac were noted and that the local community were proud of the heritage of the river. The protection of the river is important from that perspective.

The Drainage Department noted the proposed development would result in an improved water quality leaving the site, including appropriate landscaping etc.

The proposed development has been adapted and refined in response to consultation with each of the departments and professionals detailed above.

1.6 PUBLIC CONSULTATION

Public consultation has been ongoing since December 2020 and there has been a dedicated website (<https://emmetroad.ie>).

Public Consultation 2020

Initial Research - 22nd December 2020

Public Consultation 2021

22nd February 2021 - Summary of Survey Results December 2020

24th March 2021 - Online Worksheet Report January 2021

20th April 2021 - Online Consultation Event March 2021

21st April 2021 - Outdoor Exhibition at Richmond Barracks

26th April 2021 - 'Your Favourite Place to Play' – Pupils Drawings

26th April 2021 - 'The Dream Hangout Spot' – Core Youth

27th September 2021 - Outdoor Exhibition Now Available to View
21st October 2021 - Feedback Survey Deadline Announcement
29th November 2021 - Emmet Road Drone Video
29th November 2021 - Outdoor Exhibition Feedback Phase Two Consultation
Summary Report of Phase 2

Public Consultation 2022

Public Information Session 1 – Saturday 12th March 2022
Public Information Session 2 – Tuesday 15th March 2022
Public Information Session 3 – Tuesday 29th March 2022
Webinar – Tuesday 23rd March 2022
Secondary School Workshop – Wednesday 30th March 2022
Primary School Workshop – Wednesday 30th March 2022.

Core themes of the consultation related to a) height, density and tenure mix, b) safety and security, c) impact on traffic, transport and parking d) project timelines, e) management and maintenance and other issues.

Stakeholders discussed the current lack of sufficient community facilities and infrastructure in the area and the demand for more quality green space. In relation to the concerns on traffic and transportation stakeholders highlighted the need to campaign for increased capacity and frequency on public transport both bus and LUAS.

Many of the safety concerns stem from the community's previous experiences with anti-social behaviour and ongoing crime within the area.

With reference to the above, the detail in the design of the proposed development (which included liaison with an Garda Siochana in relation to design to reduce anti-social behaviour) the application material has sought to address the themes above and includes rationale for mix, as well as capacity of local public transport.

Appendix A (Volume III of this EIAR) provides a summary of the public consultation undertaken.

1.7 INFORMATION TO BE CONTAINED IN AN EIAR

The content of this Environmental Impact Assessment Report has been prepared in accordance with the provisions of Article 5(1) and Annex IV of Directive 2014/52/EU. Article 5(1) states:

“The information to be provided by the developer shall include at least:

- (a) a description of the project comprising information on the site, design, size and other relevant features of the project;*
- (b) a description of the likely significant effects of the project on the environment;*
- (c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;*
- (d) a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;*
- (e) a non-technical summary of the information referred to in points (a) to (d); and*
- (f) any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.”*

Annex IV states:

“1. A Description of the project, including in particular:

- (a) a description of the location of the project;*
- (b) a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;*
- (c) a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;*

(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases.

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

3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.

4. A description of the factors specified in Article 3(1) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.

5. A description of the likely significant effects of the project on the environment resulting from, inter alia:

(a) the construction and existence of the project, including, where relevant, demolition works;

(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;

(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;

(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);

(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;

(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;

(g) the technologies and the substances used.

The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project.

6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.

8. A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this

purpose provided that the requirements of this 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 such emergencies.

9. A non-technical summary of the information provided under points 1 to 8.

10. A reference list detailing the sources used for the descriptions and assessments included in the report.”

Article 94 and Schedule 6 of the Planning and Development Regulations 2001, as amended, transpose into Irish law the EIA Directive requirements in relation to information to be contained in an EIAR.

Article 94 states:

“An EIAR shall take into account the available results of other relevant assessments under European Union or national legislation with a view to avoiding duplication of assessments and shall contain—

(a) the information specified in paragraph 1 of Schedule 6,

(b) any additional information specified in paragraph 2 of Schedule 6 relevant to the specific characteristics of the development or type of development concerned and to the environmental features likely to be affected, and methods of assessment,

(c) a summary in non-technical language of the information required under paragraphs (a) and (b),

(d) a reference list detailing the sources used for the descriptions and assessments included in the report, and

(e) a list of the experts who contributed to the preparation of the report, identifying for each such expert— (i) the part or parts of the report which he or she is responsible for or to which he or she contributed, (ii) his or her competence and experience, including relevant qualifications, if any, in relation to such parts, and (iii) such additional information in relation to his or her expertise that the person or persons preparing the EIAR consider demonstrates the expert's competence in the preparation of the report and ensures its completeness and quality.”

Schedule 6 provides for the following information to be furnished:

1. (a) A description of the proposed development comprising information on the site, design, size and other relevant features of the proposed development.

(b) A description of the likely significant effects on the environment of the proposed development.

(c) A description of the features, if any, of the proposed development and the measures, if any, envisaged to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment of the development.

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

2. Additional information, relevant to the specific characteristics of the development or type of development concerned and to the environmental features likely to be affected, on the following matters, by way of explanation or amplification of the information referred to in paragraph 1:

(a) a description of the proposed development, including, in particular—

(i) a description of the location of the proposed development,

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

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

(iv) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases;

(b) a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects;

(c) a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge;

(d) a description of the factors specified in paragraph (b)(i)(I) to (V) of the definition of 'environmental impact assessment' in section 171A of the Act likely to be significantly affected by the proposed development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape;

(e) (i) a description of the likely significant effects on the environment of the proposed development resulting from, among other things—

(I) the construction and existence of the proposed development, including, where relevant, demolition works,

(II) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources,

(III) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste,

(IV) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters),

(V) the cumulation of effects with other existing or approved developments, or both, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources,

(VI) the impact of the proposed development on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the proposed development to climate change, and

(VII) the technologies and the substances used, and

(ii) the description of the likely significant effects on the factors specified in paragraph (b)(i)(I) to (V) of the definition of 'environmental impact assessment' in section 171A of the Act should cover the direct effects and any indirect, secondary, cumulative, transboundary, short term, medium-term and long-term, permanent and temporary, positive and negative effects of the proposed development, taking into account the environmental protection objectives established at European Union level or by a Member State of the European Union which are relevant to the proposed development;

(f) a description of the forecasting methods or evidence used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information, and the main uncertainties involved;

(g) a description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of an analysis after completion of the development), explaining the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset during both the construction and operational phases of the development;

(h) 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.

Annex IV of the EIA Directive and Article 94 of the 2001 Regulations, also require that the EIAR shall, with a view to avoiding duplication of assessments, take into account the available results of other relevant assessments under Union or national legislation. The available result of other such assessments, where relevant, have been considered in each of the chapters such as Appropriate Assessment Screening and Flood Risk Assessment.

1.8 FORMAT AND STRUCTURE OF THIS EIAR

1.8.1 EIAR Structure

The structure of the EIAR is laid out in the preface of each volume for clarity. It consists of three volumes as follows:

- **Volume I: Non-Technical Summary**

One of the objectives of the EIA process is to ensure that the public are fully aware of the environmental implications of any decisions. Article 5(1)(e) requires the developer to include a non-technical summary in the EIAR.

The EPA guidelines 2022 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 Competent Authority.

The 2018 EIA Guidelines (paragraph 4.6) prepared by the DHPLG state that the Non-Technical Summary “*should be concise and comprehensive and should be written in language easily understood by a lay member of the public not having a background in environmental matters or an in-depth knowledge of the proposed project.*”

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 in Volume I.

- **Volume II: Environmental Impact Assessment Report.**

This is the main volume of the EIAR. It provides information on the location and scale of the proposed development, details on design and impacts on the environment (both positive and negative) as a result of the proposed development.

Each of the environmental aspects as listed below are examined in terms of the existing or baseline environment, identification of potential construction and operational stage impacts and where necessary proposed mitigation measures are identified. The interaction of the environmental aspects with each other is also examined. Each chapter below includes an assessment of potential cumulative impacts with other existing and planned developments, where relevant. Environmental aspects considered include:

Chapter 3	Population and Human Health;
Chapter 4	Biodiversity;
Chapter 5	Land and Soils;
Chapter 6	Water;
Chapter 7	Air Quality and Climate;
Chapter 8	Noise and Vibration;
Chapter 9	Landscape & Visual;
Chapter 10	Material Assets – Traffic;
Chapter 11	Material Assets - Waste Management;
Chapter 12	Material Assets – Utilities;
Chapter 13	Cultural Heritage – Local History, Archaeology;
Chapter 14	Cultural Heritage – Architectural Heritage;
Chapter 15	Risk Management for Major Accidents and or Disasters;

Chapter 16 Interactions of the Foregoing;
 Chapter 17 Summary of EIA Mitigation and Monitoring Measures;

- **Volume III: Technical Appendices**

Volume III contains specialists' technical data and other related reports.

1.8.2 EIA Volume II Structure

The preparation of an EIA document requires the assimilation, co-ordination, and presentation of a wide range of relevant information in order to allow for the overall assessment of a proposed development. For clarity and to allow for ease of presentation and consistency when considering the various elements of the proposed development, a systematic structure is used for the main body of this EIA document.

The structure used in this EIA document is a Grouped Format structure. This structure examines each environmental topic⁴ in a separate chapter of this EIA document. The structure of the EIA document is set out in Table 1.3 below.

Table 1.3 – Structure of this EIA

Chapter	Title	Content
1	Introduction and Methodology	Sets out the purpose, methodology and scope of the document.
2	Project Description and Alternatives Examined	Sets out the description of the site, design and scale of development, considers all relevant phases from construction through to existence and operation together with a description and evaluation of the reasonable alternatives studied by the developer including alternative locations, designs and processes considered; and a justification for the option chosen taking into account the effects of the project on the environment.
3	Population and Human Health	Describes the demographic and socio-economic profile of the receiving environment and potential impact of the proposed development on population, i.e. human beings, and human health.
4	Biodiversity	Describes the existing ecology on site and in the surrounding catchment and assesses the potential impact of the proposed development and mitigation measures incorporated into the design of the scheme and includes mitigation measures.
5	Land and Soils	Provides an overview of the baseline position, the potential impact of the proposed development on the site's soil and geology and impacts in relation to land take and includes mitigation measures.
6	Water	Provides an overview of the baseline position, the potential impact of the proposed development on water quality and quantity and includes mitigation measures.
7	Air Quality and Climate	Provides an overview of the baseline air quality and climatic environment, the potential impact of the proposed development, the vulnerability of the project to climate change, and includes mitigation measures.

⁴ In some instances similar environmental topics are grouped.

Chapter	Title	Content
8	Noise and Vibration	Provides an overview of the baseline noise environment, the potential impact of the proposed development and includes mitigation measures.
9	Landscape & Visual Impact	Provides an overview of the baseline position, the potential impact of the proposed development on the landscape appearance and character and visual environment and includes mitigation measures.
10-12	Material Assets	Describes the existing traffic, waste management and services and infrastructural requirements of the proposed development and the likely impact of the proposed development on material assets and includes mitigation measures.
13-14	Archaeology and Architectural and Cultural Heritage	Provides an assessment of the site and considers the potential impact of the proposed development on the local archaeology, architectural and cultural heritage; and includes mitigation measures.
15	Risk Management	Provides a review of the potential vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned
16	Interactions of the Foregoing	Describes the potential interactions and interrelationships between the various environmental factors.
17	Summary of Mitigation and Monitoring Measures	Sets out the key mitigation and monitoring measures included in the EIAR Document for ease of reference.

This systematic approach described above employs standard descriptive methods, replicable assessment techniques and standardised impact descriptions to provide an appropriate evaluation of each environmental topic under consideration. An outline of the methodology employed consistently in each chapter to examine each environmental topic is provided below:

Table 1.4 – Methodology Employed to Evaluate Environmental Topic

- Introduction:
- Study Methodology:
- The Existing Receiving Environment (Baseline Situation):
- Do Nothing Scenario:
- Characteristics of the Proposed Development:
- Potential Impact of the Proposed Development:
- Avoidance, Remedial and Mitigation Measures: Avoidance:
- Predicted Impacts of the Proposed Development (Assessing the significance of residual effects, taking account of any mitigation measures):
- Monitoring:

- Reinstatement:
- Interactions and Cumulative Impacts:
- Difficulties Encountered in Compiling:
- References.

1.9 IMPACT ASSESSMENT METHODOLOGY

The likely significant effects in this EIAR are, unless otherwise indicated in a particular Chapter, described using the terminology in Table 3.4 in the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, EPA, May 2022 (the EPA Guidelines 2022), which are presented in the Table below. The use of these terms for the classification of impacts ensures that the EIA employs a systematic approach, which can be replicated across most disciplines covered in the EIAR. The consistent application of terminology throughout the EIAR facilitates the assessment of the proposed development on the receiving environment.

Table 1.5 – Description of Effects

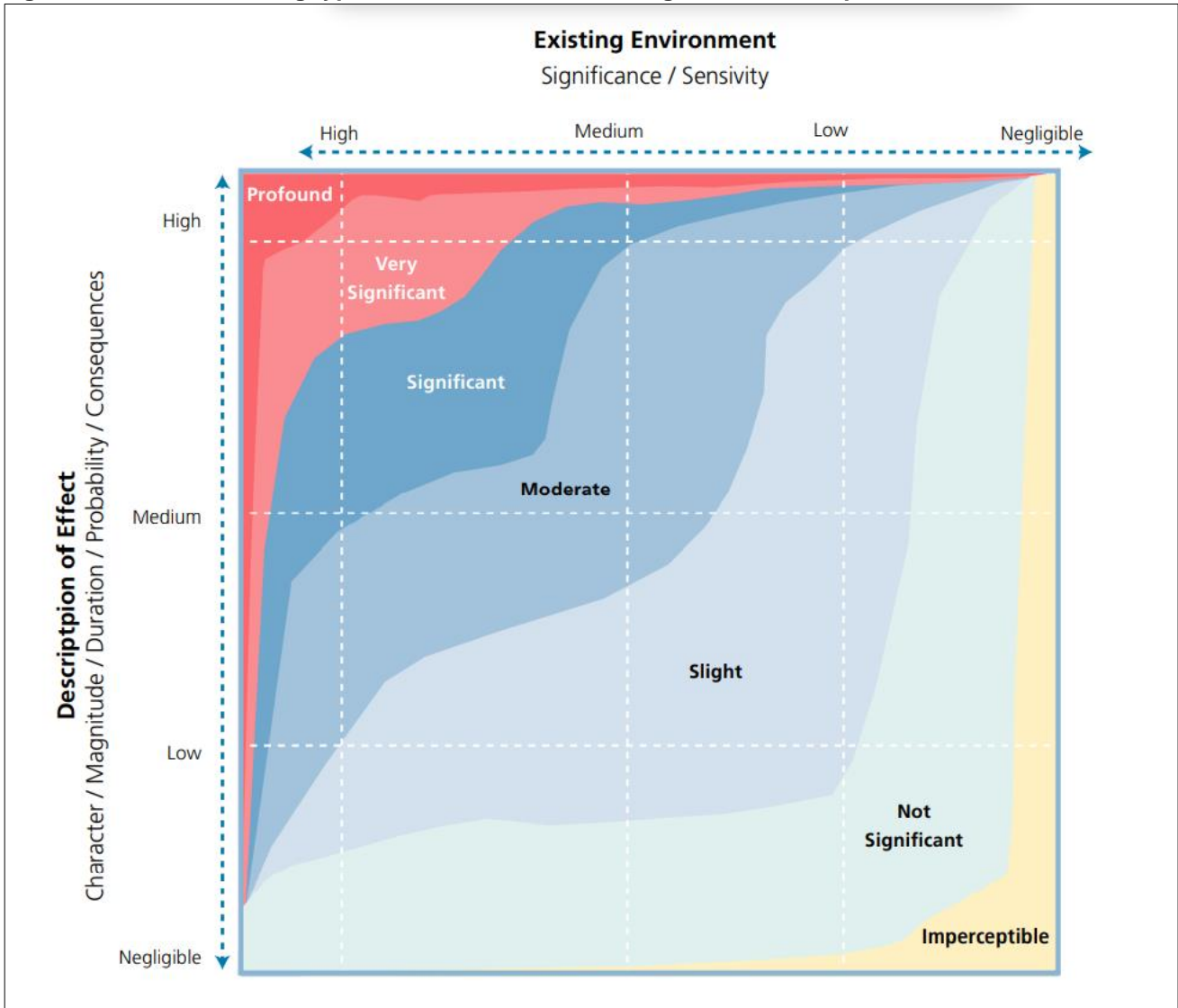
Quality of Effects	Definition
Negative /Adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance).
Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Positive	A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Significance of Effects on the Receiving Environment	Description of Potential Effects
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 most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.
Extent and Context of Effects	Describing the Extent and Context of Effects
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?)
Probability of Effects	Describing the Probability of Effects
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.

Duration of Impact	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
Frequency of Effects	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).
Types of Effect	Describing the Types of Effects
Indirect Effects (a.k.a. Secondary Effects)	Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
Cumulative Effects	The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects
'Do-Nothing Effects'	The environment as it would be in the future should the subject project not be carried out.
'Worst case' Effects	The effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable Effects	When the full consequences of a change in the environment cannot be described
Irreversible Effects	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic Effects	Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SO _x and NO _x to produce smog).

Source: Table 3.4 EPA Guidelines 2022

The diagram below shows how comparison of the character of the predicted impact to the sensitivity of the receiving environment can determine the significance of the impact.

Figure 1.1 – Chart showing typical classifications of the significance of impacts/effects



Source: Figure 3.4 of EPA Guidelines 2022

1.10 EIAR PROJECT TEAM

The preparation of this EIAR was project managed, co-ordinated and produced by John Spain Associates with the assistance of a team of specialist subject matter experts to assess the environmental impact of the project.

Recital 33 of the amended EIA Directive (Directive 2014/52/EU) states the following in relation to the persons responsible for preparing the environmental impact assessment reports:

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

Article 5(3) of the EIA Directive (Directive 2014/52/EU) obliges the project developer to "ensure that the environmental impact assessment report is prepared by competent experts". To demonstrate compliance with this, Article 94(e) of the Planning and Development Regulations 2001 to 2021 requires the developer to include the following information in the EIAR:

- a list of the experts who contributed to the preparation of the report, identifying for each such expert—*
 - (i) the part or parts of the report which he or she is responsible for or to which he or she contributed,*

- (ii) his or her competence and experience, including relevant qualifications, if any, in relation to such parts, and
- (iii) such additional information in relation to his or her expertise that the person or persons preparing the EIA consider demonstrates the expert's competence in the preparation of the report and ensures its completeness and quality.

Each environmental specialist engaged in the preparation of this EIA was commissioned having regard to their previous experience in EIA; their knowledge of relevant environmental legislation relevant to their topic; familiarity with the relevant standards and criteria for evaluation relevant to their topic; ability to interpret the specialised documentation of the construction sector and to understand and anticipate how their topic will be affected during construction and operation phases of development; ability to arrive at practicable and reliable measure to mitigate or avoid adverse environmental impacts; and to clearly and comprehensively present their findings.

Each environmental specialist was required to characterise the receiving baseline environment; evaluate its significance and sensitivity; predict how the receiving environment will interact with the proposed development and to work with the EIA project design team to devise measures to mitigate any adverse environmental impacts identified.

The relevant specialist consultants who contributed to the EIA and their inputs are set out in Table 1.6 below.

Table 1.6 – EIA List of Competent Experts

Organisation	EIA Specialist Topics / Inputs
John Spain Associates, Planning & Development Consultants, 39 Fitzwilliam Place, Dublin 2, D02 ND61 T: 01 662 5803 Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt	Introduction and Methodology Project Description and Alternatives Examined Population and Human Health Interactions of the Foregoing Principal Mitigation and Monitoring Measures Non-Technical Summary
Enviroguide Consulting Claire Clifford BSc., MSc., PGeo, EurGeol Technical Director Dr Siobhán Atkinson Senior Ecologist Liam Gaffney (BSc, MSc) Senior Ecologist	Biodiversity (including Bat and Bird Surveys)
Ian Crehan, Associate OCSC Consulting Engineers. BE, CEng, MIEI., MStructE, RConsEI	Land and Soils/ Human Health
Mark Killan, Associate OCSC Consulting Engineers. BEng, MSc, CEng, MIEI	Water and Hydrogeology / Human Health
Patrick Raggart, Associate OCSC Consulting Engineers BEng, PGDipPrjMgt, PFDipH&S, CEng MIEI, Chartered Civil Engineer	Material Assets-Traffic
Byrne Environmental Ian Byrne Managing Director, MSc, MIOA, Diploma in Environmental & Planning Law	Material Assets (Waste Management)
Daniel Gray Senior Electrical Engineer, IN2 Consulting Engineers. Ian Crehan, Associate OCSC Consulting Engineers. BE, CEng, MIEI., MStructE, RConsEI	Material Assets (Utilities)
Byrne Environmental Ian Byrne Managing Director, MSc, MIOA, Diploma in Environmental & Planning Law	Air Quality and Climate (Population and Human Health)
Byrne Environmental Ian Byrne Managing Director, MSc, MIOA, Diploma in Environmental & Planning Law	Noise and Vibration (Population and Human Health)

Organisation	EIAR Specialist Topics / Inputs
Richard Butler, BL Arch MSc MILI MIPI Modelworks	Landscape and Visual Impacts
Brian Mills, Safety Manager, Linesight	Risk Management
Faith Bailey MA, BA (Hons), MCIfA Associate Director IAC Kevin Blackwood Conservation Architect RIAI Grade 1 accredited	Archaeology, Architectural Heritage and Cultural Heritage
John Spain, BBS, MRUP, MRTPI, MIPI, Managing Director, John Spain Associates	Review of EIAR

1.10.1 COMPETENT EXPERT DETAILS

Introduction, Introduction and Methodology, Project Description and Alternatives Examined, Population and Human Health, Interactions of the Foregoing, Principal Mitigation and Monitoring Measures, Non-Technical Summary.

Rory Kunz is an Executive Director with John Spain Associates and is a corporate member of the Irish Planning Institute. Rory Kunz has a Masters in Environmental Resource Management and a Diploma in EIA Management (both from UCD) as well as a Masters in Town and Country Planning. Rory has 19 years of experience of Environmental Impact Assessment and urban development.

Rory has acted as lead planning consultant on a range of high-quality complex planning applications across the country over an extended period. Rory has wide-ranging experience in the management and review of Environmental Impact Assessment Reports (EIAR) for major residential and mixed use development and redevelopment projects.

John Spain has over 30 years’ experience of planning and development consultancy in Ireland and of leading complex projects through the statutory planning process.

In that time, he has acted for a large number of private and public sector clients and has been involved in a range of planning work in relation to most types of property including residential, office, industrial, retail, and strategic infrastructure.

John is the lead consultant on most major projects undertaken by the practice.

John has an in depth understanding of the Irish Planning System in practice and has the clear understanding of client objectives and provides advice to aim to have the optimal outcome for the client in navigating successfully through the planning process.

Biodiversity

Enviroguide Consulting as a company remains fully briefed in European and Irish environmental policy and legislation. Professional memberships include the Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association and Chartered Institute of Ecology and Environmental Management (CIEEM).

All surveying and reporting have been carried out by qualified and experienced ecologists and environmental consultants. Aisling Walsh, Professional Bat Ecologist with Ash Ecology and Environmental Ltd. undertook the on-site bat surveys in 2020 and 2022. Liam Gaffney, Senior Ecologist with Enviroguide Consulting undertook the bat surveys in 2021 and a breeding bird survey in 2021. Siobhán Atkinson, Senior Ecologist with Enviroguide Consulting prepared this chapter, and undertook the desktop research, habitat surveys, a breeding bird survey and invasive species surveys for it. Eric Dempsey, Expert Ornithologist, undertook a biodiversity assessment, breeding bird and winter bird surveys at the Site. Brian McCloskey, Graduate Ecologist and Ornithologist with Enviroguide Consulting also undertook winter bird surveys at the Site.

Aisling Walsh M.Sc MCIEEM Trading as Ash Ecology & Environmental Ltd. prepared the Bat Survey Report. Aisling’s qualifications include M.Sc. (Dist) in Biodiversity and Conservation (TCD) and B.Sc. (Hons) Zoology (NUIG), a diploma in Applied Aquatic Science (GMIT) and a Certificate in Applied Biology (GMIT). Aisling has over 15 years of experience providing environmental consultancy and environmental assessment services. Aisling has written numerous Ecological Impact Assessments (EIA), Screening for Appropriate Assessment Stage I and Stage II Natura

Impact Statements, chapters for Environmental Impact Assessments/Statements (EIAR), Badger Surveys, Bat Surveys, Bird and Habitat Surveys.

Aisling is a licenced bat ecologist (example of recent: DER/BAT 2020 – 46 EUROPEAN, DER/BAT 2020 – 48 EUROPEAN, DER/BAT 2021 – 89 EUROPEAN, DER/BAT 2022 – 12 EUROPEAN) and a member of Bat Conservation Ireland. In addition, she has completed several bat courses to continue her training and CPD with the most recently (May 2021) a Lantra-accredited course, developed by the Bat Conservation Trust and supported by the Arboricultural Association to access bat tree roost features. Over the past 15 years Aisling has completed 100s of bat surveys providing her with more than adequate experience in the profession.

Dr Siobhán Atkinson has a B.Sc. (Hons) in Environmental Biology and a Ph.D. in Freshwater Biology from University College Dublin, and extensive experience in desktop research, literature review and reporting, as well as practical field and laboratory experience including environmental DNA analysis, freshwater macroinvertebrate sampling and identification, fish sampling and processing and 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.

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, EclAs, 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.

Brian McCloskey is a graduate ecologist and experienced Ornithologist with 11 years of bird survey experience. Brian holds a degree in Planning and Environmental Management from Technological University Dublin. Brian is a longstanding and active member of Bird Watch Ireland and has provided Ornithology survey work for ecological consultancies, e.g., vantage points surveys of Gulls, Terns, Raptors, Waders and Wildfowl; hinterland surveys of the above as well as riverine species; and breeding waders and country birds. Brian is highly experienced with all survey methodologies and with surveying all species groups of Irish birds and migrants.

Eric Dempsey is an Expert 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 very experienced with all survey methodology and has inputted in various Environmental Impact Assessment Reports, Environmental Assessments and Appropriate Assessments. Eric is currently part of the team of field ornithologists undertaking the long-term Dublin Bay Wetlands Survey.

Land and Soils

The author is Eleanor Burke, a Chartered Scientist (CSci) and a Member of the Institution of Environmental Science (MIEnvSc) who has a Bachelor of Science in Environmental Science and Masters in Environmental Sciences with over 20 years experience in ground and contaminated land investigations in Ireland and the UK. Ms. Burke has been involved in numerous brownfield redevelopment projects of similar scale and in particular has been involved in this project for over 12 months. Ms. Burke has also completed numerous Land and Soils Chapters for similar residential and commercial schemes and is therefore suitably qualified and experienced to undertake this assessment.

Water and Hydrology

This Chapter was prepared by Mark Killian, for O'Connor Sutton Cronin consulting engineers; he is a Chartered Engineer; has obtained Bachelor of Engineering and Master of Science degrees, with specialisation in surface water drainage and hydrology; and has over fifteen years' experience in the design and delivery of urban development schemes, with particular focus on flood risk management and drainage and water supply infrastructure. He has advised a range of clients including government bodies, local authorities, water companies and private developers, and has provided detailed designs for projects in Ireland, the UK, and Australia, taking account of local technical standards and hydrological conditions.

Air Quality and Climate

Ian Byrne MSc Environmental Protection, Dip Planning and Environmental Law has approximately 25 years experience in the preparation of Air and Climate Impact Assessments for EIA for various projects including SHD, LRD and mixed-use developments.

Noise and Vibration

Ian Byrne MSc. Environmental Protection, Dip Environmental & Planning Law, Member of the Institute of Acoustics, is the Principal Environmental Consultant of Byrne Environmental Consulting Ltd and prepared all aspects of this EIA Chapter. Ian Byrne has over 25 years experience in the monitoring and assessment of noise and vibration impacts that the construction and operation of residential, commercial and industrial developments may have on the receiving environment. In particular we have significant experience in preparing the noise and vibration impact assessment Chapters of EIA's for SHD's and LRD's.

Based on academic qualifications and professional experience, Ian Byrne is defined as a "Competent Person" as defined in the EPA's 2016 Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).

Landscape and Visual Impact Assessment

This chapter was prepared by Richard Butler of Model Works Ltd. Richard has degrees in Landscape Architecture (B.L.Arch, University of Pretoria, 1995) and Town Planning (MSc Spatial Planning, Dublin Institute of Technology, 2007), is a member of the Irish Landscape Institute and the Irish Planning Institute and has over 20 years' experience in Landscape and Visual Impact Assessment (LVIA). In the last number of years Richard has prepared LVIA chapters for EIA for the following projects among others:

- Guinness Quarter, Dublin.
- O'Devaney Gardens SHD, Dublin.
- Dublin Arch (Connolly Quarter).
- Augustine Hill (Ceannt Station), Galway.
- Pembroke Quarter Phase 1, Dublin.
- St Joseph's House and Adjoining Properties SHD, Dun Laoghaire Rathdown.
- Howth Road SHD, Co. Fingal.
- Sandford Road SHD, Dublin.
- Charlestown Place SHD.
- Parkside 4 SHD and Parkside 5B and 6 SHD, Dublin.
- Scotch Hall SHD, Drogheda.
- Griffith Avenue SHD, Dublin.
- Concorde SHD, Dublin.
- Leopardstown Hospital, Dun Laoghaire Rathdown.

Material Assets – Traffic

This Chapter of the EIA has been prepared by Patrick Raggett of O'Connor Sutton Cronin Multidisciplinary Engineers, a Chartered Civil Engineer with over 14 years' experience and with specific expertise in traffic & transport engineering, having been involved in the successful planning, design and completion of a wide range of projects in Ireland and the United Kingdom (UK), ranging from a mix of commercial, residential, healthcare and leisure developments to major road and civil infrastructural schemes. Works completed included detailed traffic & transportation assessments and planning, road and scheme design, mobility management planning and peer review. Examples include:

- Sandford Central SHD (An Bord Pleanála Reference: ABP-305940-19) – 564 residential units in the heart of Sandford Business District with works completed including road design, preparation of a comprehensive Traffic & Transportation Assessment, car parking strategy, preparation of an EIA chapter and a Mobility Management Plan. This was given a grant of permission in March 2020 and is currently at construction stage;
- Connolly Quarter Commercial Development (Dublin City Council Reference: 2723/20) – 3 no. commercial blocks ranging in height from 9 storeys to 13 storeys with a cumulative gross floor area of 42,670sq.m and including office, hotel and retail uses on a site adjacent Connolly Station in Dublin City. Works completed included road

- design, preparation of a comprehensive Traffic & Transportation Assessment, car parking strategy, preparation of an EIAR chapter and a Mobility Management Plan. This was given a grant of permission in January 2021;
- Dublin Landings Mixed Use Development (Dublin City Council References: DSDZ3350/15, DSDZ2749/16, DSDZ2750/16, DSDZ3552/16) – mixed use development located in Dublin City on North Wall Quay comprising both residential (c. 284 units) and office (c. 64000m²) with additional ancillary elements. Works completed included road design, preparation of a comprehensive Traffic & Transportation Assessment, car parking strategy and Mobility Management Plan. This was given a grant of permission and is currently at construction stage with a number of blocks completed and occupied

Material Assets – Waste Management

This Chapter of the EIAR has been prepared by Patrick Raggett of O'Connor Sutton Cronin Multidisciplinary Engineers, a Chartered Civil Engineer with over 14 years' experience and with specific expertise in traffic & transport engineering, having been involved in the successful planning, design and completion of a wide range of projects in Ireland and the United Kingdom (UK), ranging from a mix of commercial, residential, healthcare and leisure developments to major road and civil infrastructural schemes. Works completed included detailed traffic & transportation assessments and planning, road and scheme design, mobility management planning and peer review.

Material Assets – Utilities

This report was prepared by Daniel Gray Senior Electrical Engineer, IN2 Consulting Engineers and Ian Crehan, Associate OCSC Consulting Engineers. BE, CEng, MIEI., MStructE, RConsEI from both O'Connor Sutton Cronin Engineers (Civil & Structural Consultants for the project) and In2 Engineers (Mechanical & Electrical Engineers for the project). Both Engineers are chartered and have over 15 years' experience each working in consulting engineering practice. Their experience has been gained on a wide variety of projects including public buildings, residential, community facilities and commercial developments. They have been involved at all stages of projects from inception through to completion on site. They have been involved in the planning applications for numerous projects including projects of a similar size and scale to the proposed development.

Cultural Heritage – Archaeology

This chapter was prepared by Faith Bailey (MA, BA (Hons), MIAI, MCIfA) of IAC. Faith has over 18 years' experience in archaeological and cultural heritage consultancy, responsible for the production of EIAR and assessments for all aspects of development nationwide.

Cultural Heritage – Architectural Heritage

Kevin Blackwood FRIAI is a Conservation Architect at Blackwood Associates Architects with a broad experience in the conservation and adaptation of historic buildings and sites. He has been Grade One accredited since 2006. As well as managing the practice, he has been responsible for the design and project management of a series of important public commissions. After graduation from UCD in 1990, he trained with the National Monuments Service of the Office of Public Works, during which time he worked on the conservation and restoration of Barryscourt Castle, a substantial medieval keep in Co. Cork, amongst other important buildings in state care. He qualified as an architect, MRIAI in 1995. In 1996 he founded the practice of Blackwood Associates, which has established itself as one of the leading conservation practices in the country. Kevin is a member of the International Council of Monuments and Sites (ICOMOS) and founding member and former chairman of the Building Limes Forum. He is a member and former chairman of Historic Buildings Committee RIAI, and former Chairman Appeals Board Panel Conservation Accreditation RIAI 2012 – 15.

Steven Murphy is an architectural technologist and historic buildings consultant with extensive experience in the survey, design, project management and execution of projects for the conservation and adaptation of historic buildings. Steven graduated with a B.Sc. Arch. Tech from Waterford IT in 2003 and joined Blackwood Associates in 2010, since when he has been responsible for a number of projects, including Richmond Barracks and Carrickmacross Market House. In 2017 he completed a PgD in Building Repair and Conservation at Trinity College Dublin.

Risk Management for Major Accidents and or Disasters

The chapter, prepared by Brian Mills, Safety Manager of Linesight, identifies and assesses the likelihood and potential significant adverse impacts on the environment arising from the vulnerability of the proposed development

to risks of major accidents and / or natural disasters. It considers whether the proposed development is likely to cause accidents and / or disasters and its vulnerability to them.

1.11 RELATED DEVELOPMENT AND CUMULATIVE IMPACTS

The proposed development also has the potential for cumulative, secondary and indirect impacts particularly with respect to such topics as traffic which in many instances are often difficult to quantify due to complex inter-relationships. All cumulative, secondary and indirect impacts are unlikely to be significant and, where appropriate, have been addressed in the content of this EIAR document.

The EPA Guidelines on Information to be contained in Environmental Impact Assessment Reports (2022) defines 'Cumulative Effects' as:

“The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.”

The EIAR includes a cumulative assessment of existing and permitted development in the area.

1.11.1 Existing and Permitted Development

The details of these permissions / applications, along with the planned development adjoining the current proposals, have been provided to the EIAR consultancy team and inform the cumulative impact assessment to be undertaken as part of the preparation of this EIAR, with each consultant considering and undertaking their own planning history search in respect to their cumulative impact assessment where necessary.

Relevant developments have been identified with regard to their size and scale, their use mix and composition, and their proximity to the proposed development, within the Inchicore area, in particular to identify any substantial / strategic residential development or larger scale commercial development. Applications of a minor nature were discounted from the planning history search, for example applications for under 5 no. dwellings, or applications relating to minor extensions, works to existing dwellings, and change of use applications. The planning history search focussed on relevant permitted developments in the last 5 years, with a search also undertaken for permitted longer term permissions (i.e. with a 10 year permission).

The following cumulative developments are noted:

KA29N.314091 Liffey Valley to City Centre, County Dublin – Bus Connects

On the 15th of July 2022, the National Transport Authority lodged the Liffey Valley to City Centre Core Bus Corridor Scheme Compulsory Purchase Order 2022. The Case is due to be decided by 25/01/2023. (further detail at [Home - BusConnects Dublin – Liffey Valley to City Centre \(liffeyvalleyscheme.ie\)](https://www.ncta.ie/BusConnectsDublin-LiffeyValleytoCityCentre))

The route is located to the north of the proposed development on Emmet Road.

Planning Ref: 2997/21.

Applicant: Derek Kelly. Address: Emmet Manor, Emmet Court, Saint Vincent Street West, Dublin, 8. Decision date: 10-Feb-2022. Decision: REQUEST AI EXT OF TIME. **Description:** *The development will consist of: (i) Construction of a four-storey flat-roofed apartment block comprising 4 no. one-bedroom and 12 no. two-bedroom apartments each to be served by private south facing terraces and 1 no. vehicular parking space; (ii) Provision of new bicycle shed and bin store to serve apartment block; and (iii) All ancillary works, inclusive of landscaping and SuDS drainage, necessary to facilitate the development. The proposal will increase the number of residential apartments within Emmet Court from 96 to 112 and reduce the number of car parking spaces from 87 to 75.*

Planning Ref: 3815/20.

Application Type: Permission. Applicant: Board of Management of Our Lady of Lourdes National School. Address: Our Lady of Lourdes National School, Goldenbridge, Inchicore, Dublin 8. Granted: 11-Mar-2021. Description: *PROTECTED STRUCTURE: The site is bordered by St. Vincent Street West and Emmet Crescent. The proposed development consists of: A) Phased demolition of the middle section of the existing school building;*

removal of prefabricated temporary teaching accommodation units and selected trees. B) Refurbishment and alterations of the retained sections of the building including internal works to existing classrooms on ground floor to provide a new two classroom special educational needs unit and provision of the application of new insulated rendering system to building facades and upgrade of existing windows and doors. C) Construction of two-storey extension to the middle section of the existing school building, consisting of a general purpose hall, special education tuition rooms, multi-purpose room, home school liaison room, 4 no. general classrooms, a library, offices, staff room, stores, toilets, circulation areas, and ancillary accommodation. D) Provision of 22 no. on-site car parking spaces. E) Widening of existing vehicular access and provision for a new pedestrian site access with refurbishment of existing gates and provision of new gates all facing Emmet Crescent Street. F) Provision of 60 no. on-site bicycle parking spaces; refurbishment of gate facing St. Vincent Street West; provision of covered bin store. G) Provision of new hard surfaced and planted play and amenity areas, erection of 6 no. new flagpoles, refurbishment and upgrade of existing boundary walls, fences and gates (as described above and including a pedestrian gate towards the convent at the western site boundary), and provision of ancillary site works at this location. The site is in the curtilage of protected structures, Sisters of Mercy Chapel & Convent to the west.

Planning Ref: 4260/19.

Application Type: Permission. Applicant: Circle Voluntary Housing Association. Address: Site 1b St. Michael's Estate, Inchicore, Dublin 8. Granted: 24-Jan-2020. Description: *Permission for development at this site (0.72 hectare), known as Site 1b St. Michael's Estate, Inchicore, Dublin 8 bounded by Richmond Barracks to the north, the rear of Connolly Avenue to the east and Thornton Heights to the south. The development will consist of a one to four storey older persons housing with supports scheme, incorporating: (i) 52 no. apartment dwellings with balconies; (a) 16 no. 2 bedroom apartments; (b) 36 no. 1.5 bedroom apartments. (ii) Communal facilities at ground floor level to include a multipurpose room, additional ancillary spaces, staff offices and a publicly accessible tea room (26.5m²). (iii) Landscaping works to include resident courtyards and a landscaped open space (facing the St. Michaels Estate road) incorporating a new vehicle setdown area. (iv) 15 no. car parking spaces. (13 no. new car parking spaces to be accessed from an existing vehicular entrance and the relocation of 2 no. existing car parking spaces adjacent to the new vehicle setdown area). (v) 52 no. bicycle parking spaces. (vi) (ESB substation), external signage, site perimeter boundary treatments, plant rooms, waste storage enclosures and all associated ancillary development works and services. (vii) The development will consist of the following floor areas: - Total gross internal floor area (GIA): 4,655m² (inclusive of all residential, communal, vertical circulation & ancillary spaces). - Area of external deck/gallery access (excluding balconies): 1,066.6m². - Area of roof terrace (excluding balconies): 100.1m². (viii) The building will be one to four storeys in height, with a top parapet level of 40.04m OD (measuring 14.835m above finished ground floor level).*

Planning Ref: 2453/19.

Application Type: Permission. Applicant: Vabtol Limited. Association. Address: Site to the rear of 205A, Emmet Road, Inchicore, Dublin 8. Granted: 29-July-2019. Description: *Amendment to Planning Ref. No. 3635/16 for the previous approved 4-storey apartment development in the backlands for the increase in height to six storey building above semi-basement level consisting of: 6 no. one-bed, 18 no. two-bed apartments; which include balconies to the north, west & south elevations, additional covered bike storage areas, refuse store, with revised 18 no. car parking spaces off vehicular access road from Emmet Road, with associated landscaping & site works.*

Planning Ref: 2747/20.

Application Type: Permission. Applicant: Durkan (Davitt Road) Ltd. Address: Former Dulux Factory Site, Davitt Road, Dublin 12, D12 C97T. Granted: 04-Nov-2020. Description: *The development will consist of modifications to development previously permitted under Reg. Ref. ABP-303435-19 (DCC Ref. SHD0002/19). The modifications for permission consist of (a) alteration to window format at third and fourth floor level on east and west elevation to provide windows to corridor only; (b) window format altered at sixth floor level of south elevation of Blocks A and B; (c) balconies and windows removed from eastern elevation of 4no. apartments at fifth and sixth floor level of Block B due to internal layout requirements related to fire safety; (d) extension of elevator and lift core within Block A from fourth floor to fifth floor level for fire safety purposes, giving an overall height increase of 3.7m; (e) communal lounge extended by 3sqm to connect to extended lift/stair core at fifth floor level; (f) ESB Kiosk (approx. 23.47sqm) at Galtymore Road elevation relocated approximately 6m to the east and redesigned to ESB standards; (g) bin store added to internal layout of ESB substation building (approx. 7.09sqm); (h) bin store (approx. 9.77sqm) added to eastern courtyard; (i) accessible rest room added to guest room at fifth floor level; (j) glazed balconies converted to brick at ground floor level of south elevation and east and west internal courtyard elevations; (k) alteration to glazing at street level of Block B fronting Davitt Road; (l) alterations to selected balconies (8no.) at third and fifth floor to convert from cladding to glazed treatment; and (m) unit layouts of apartments 104 and 110 at first and second floor of block B, fronting Davitt Road, reconfigured to allow sufficient separation distance between proposed balconies and ground floor ESB substation entrance.*

Reg. Ref. ABP-303435-19

Permitted SHD application located the Former Dulux Factory Site, Davitt Road, Dublin 12 for the construction of 265 Build to Let Apartments, 119 car parking spaces, café, including range of communal space on a site of c. 0.8 hectares as follows: *The development will consist of 265 'Build-To-Rent' apartments in 4 no. 3-7 storey blocks with a basement level. The development will include a retail/café unit, a resident's gym, 119 no. basement car parking spaces, internal semi-public paths, public and private open spaces and all communal facilities (including refuse storage space and 560 no. bike parking spaces at basement and ground level).*

Each Chapter of the EIAR includes a cumulative impact assessment of the proposed development with other permitted projects in the immediate area (e.g., Part 8 development for demolition and 52 unit older persons housing scheme to the east). The potential cumulative impacts primarily relate to traffic, dust, noise and other nuisances from the construction of the development, with other planned which are in the course of construction, and each of the following EIAR chapters has regard to these in the assessment and mitigation measures proposed.

To determine traffic impacts in Chapter 10 the traffic generated by the proposed development is combined with the baseline traffic generated by the traffic on the road network in the area. The potential traffic impacts from other developments were also considered in the assessment.

For the noise impact assessment in Chapter 8 the potential noise emissions arising from the proposed development during construction and operation are combined (using cumulative AADT figures from Traffic chapter) with background noise levels (predominantly road traffic) were assessed.

Each of the relevant specialists has considered the potential for cumulative impact in preparing their assessments. While there is the potential for negative impacts to occur during the construction stage of the scheme, with the implementation of the appropriate mitigation outlined in the EIAR, the residual cumulative impact is not considered to be significant.

1.12 TRANSBOUNDARY IMPACTS

Large-scale transboundary projects⁵ are defined as projects which are implemented in at least two Member States or having at least two Parties of Origin, and which are likely to cause significant effects on the environment or significant adverse transboundary impact.

Having regard to the nature and extent of the proposed development, which comprises a residential development, located in the south west inner city of Dublin city within the administrative area of Dublin City Council, transboundary impacts on the environment are not considered relevant, in this regard.

1.13 LINKS BETWEEN EIA AND APPROPRIATE ASSESSMENT/NIS

Article 6(3) of the Habitats Directive (92/43/EEC) provides that any project not directly connected with or necessary to the management of a Natura 2000 site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to an Appropriate Assessment of its implications for the site in view of the site's conservation objectives.

In January 2010 the DoEHLG issued a guidance document entitled '*Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities*'. This guidance document enshrines the '*Source-Pathway-Receptor*' into the assessment of plans and projects which may have an impact on Natura 2000 sites.

An Appropriate Assessment screening by Enviroguide was carried out in accordance with '*Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites – Methodological Guidance on the Provisions of Article 6 (3) and (4) of the Habitats Directive 92/43/EEC*' - Brussels, 28.9.2021 C(2021) 6913 final. The AA Screening is included with the Part 10 application.

⁵ The definition is based on Articles 2(1) and 4 of the EIA Directive and Article 2(3) and (5) of the Espoo Convention, respectively. <http://ec.europa.eu/environment/eia/pdf/Transboundry%20EIA%20Guide.pdf>

In accordance with these Guidelines, the Appropriate Assessment may be a separate document or form part of the EIA. In the case of the proposed development a separate Appropriate Assessment Screening Report is submitted with this application as a standalone report and referenced in the Biodiversity Chapter.

Article 5(1) of the Directive also states that the EIA shall include the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the project on the environment, taking into account current knowledge and methods of assessment. The developer shall, with a view to avoiding duplication of assessments, take into account the available results of other relevant assessments under Union or national legislation, in preparing the environmental impact assessment report.

In this regard a brief account of how the results of other relevant assessments considered in the preparation of this EIA is included as Appendix A Volume III of the EIA.

1.14 AVAILABILITY OF EIA DOC

A copy of this EIA document and Non-Technical Summary of the EIA document is available for purchase at the offices of An Bord Pleanála and Dublin City Council (Planning Authority) at a fee not exceeding the reasonable cost of reproducing the document. It can also be viewed on the website: <https://emmetroad.ie> set up by the applicant.

1.15 IMPARTIALITY

This EIA document has been prepared with reference to a standardised methodology which is universally accepted and acknowledged. Recognised and experienced environmental specialists have been used throughout the EIA process to ensure the EIA document produced is robust, impartial and objective.

1.16 STATEMENT OF DIFFICULTIES ENCOUNTERED

No particular difficulties, such as technical deficiencies or lack of knowledge, were encountered in compiling any of the specified information contained in this statement, such that that the prediction of impacts has not been possible. Where any specific difficulties were encountered these are outlined in the relevant chapter of the EIA.

1.17 FORECASTING METHODS USED FOR ENVIRONMENTAL EFFECTS

The methods employed to forecast, and the evidence used to identify the significant effects on the various aspects of the environment are standard techniques used by each of the particular individual disciplines. The general format followed was to identify the receiving environment, to add to that a projection of the “loading” placed on the various aspects of the environment by the development, to put forward amelioration measures, to lessen or remove an impact and thereby arrive at net predicted impact.

Where specific methodologies are employed for various sections, they are referred to in the Receiving Environment (Baseline Scenario) sections in the EIA. Some of the more detailed/specialised information sources and methodologies for a number of the environmental assessments are outlined hereunder.

1.18 EIA QUALITY CONTROL AND REVIEW

John Spain Associates is committed to consistently monitoring the quality of EIA documents prepared both in draft form and before they are finalised, published and submitted to the appropriate competent authority taking into account latest best-practice procedure, legislation and policy. The EPA published draft guidelines on information to be contained in Environmental Impact Assessment Report⁶ and the Department of Housing, Planning, Community and Local Government have published a consultation paper⁷, which have been consulted in the preparation of this EIA.

⁶ *Guidelines on the Information to be contained in Environmental Impact Assessment Reports, Environmental Protection Agency, 2022*

⁷ *Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems - Key Issues Consultation Paper, Department of Environment, Community and Local Government, 2017.*

This document includes a detailed EIA Review Checklist which has been used to undertake a review of this EIA document.

1.19 ERRORS

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

2.0 DESCRIPTION OF THE PROJECT AND ALTERNATIVES EXAMINED

2.1 INTRODUCTION AND TERMS OF REFERENCE

The description of the proposed development is one of the two foundations upon which an EIAR is based (the other being the description of the existing environment described in this chapter and by each of the specialist consultants in the subsequent chapters). Annex IV sets out the requirements for describing the proposed development as follows:

"1. Description of the project, including in particular:

- (a) a description of the location of the project;
- (b) a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
- (c) a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;
- (d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases."

It is also a requirement of the EIA Directive (as amended) to present "a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment."

2.2 DESCRIPTION OF THE LOCATION OF THE PROJECT

The project site is located on a site of c. 4.68 hectares in Inchicore, Dublin 8. The overall site includes watermain works along Emmet Road to the junction with Tyrconnell Road/Grattan Crescent as well as tie in works surrounding the site. The main development site (c. 3.72 hectares) is bounded by Emmet Road to the north, Goldenbridge Cemetery to the south, "Patriot's Path" and Richmond Barracks to the east and St. Vincent's Street West to the west.

The project site is located in the heart of Inchicore village within a well-established setting. The site is approximately 350m long with width varying from 105-115m in an east west direction. The overall site covers approximately 4.68 hectares in total across a mixture of existing buildings, existing hard landscaped areas and existing greenfield/brownfield space as well as the works along Emmet Road.

2.2.1 Wider Locational Context

Inchicore village has a collection of smaller local retailers, local services and pubs, with an intermittent spine of commercial activity stretching eastward on Emmet Road, passing by the site's northern frontage. Richmond Park, home of Saint Patrick's Athletic Football Club, is accessed from Emmet Road to the northeast of the site, opposite Saint Michael's church. Goldenbridge cemetery, to the south of the site, is currently in active usage. It is surrounded by a high stone wall, sections of which have been taken down to lower level on the southern and western sides to allow views into the cemetery. To the south of the cemetery is the Grand Canal greenway and pedestrian bridge over the canal, allowing access to the Drimnagh stop on the Luas Red Line.

The site is bounded to the west by Saint Vincent Street West, which features 2 storey terraced housing at its northern end, access to Mercy Secondary School via Thomas Davis Street West, the Tyrone Place estate (5 storey) in the middle and access to Our Lady of Lourdes primary school and Goldenbridge community facilities at its southern end via Emmet Crescent. Further to the east of the site is the Bulfin estate, consisting of 2 storey terraced and semi-detached early 20th century Council housing. Further to the west are some more recent apartment developments (up to 7 storeys) and the Goldenbridge Industrial Estate which is accessible from Tyrconnell Road.

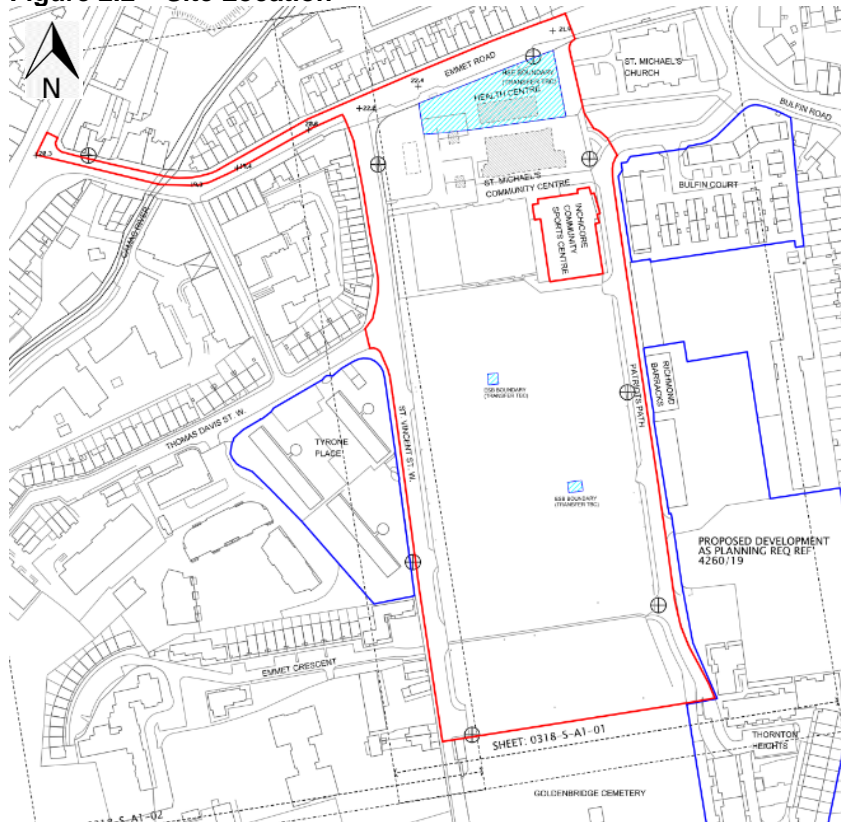
The community has several primary schools and one secondary school, a third level college, several churches and a collection of noteworthy cultural assets, namely the former Richmond Barracks and Goldenbridge Cemetery. Kilmainham Gaol, the Irish Museum of Modern Art and the Irish National War Memorial Gardens are all in close proximity. The Grand Canal, with its greenway, is situated to the south of Inchicore and the subject site adjacent to the Luas line. The Camac river flows in a north easterly direction through Inchicore, some sections of which are built over, but other sections open onto green spaces.

Figure 2.1 – Site Location Context



Source: Google Maps

Figure 2.2 – Site Location



2.2.2 Roads/Access

Principal road access to the subject site is from Emmet Road, designated R810, which provides a direct link between the city centre and the M50 motorway (Red Cow Junction). The R810 connects to the R111 to the north east of the site, which routes around the southern side of Dublin adjacent to the Grand Canal. This enables easy access to the south of the city via the various arterial roads leading from the city centre. The R810 is connected to the site area by Saint Vincent Street West and Bulfin Road/Patriots Path (which becomes Thornton Heights at its southern end). These roads provide access to the western and eastern sides of the site respectively. There is currently no connection between these two roads through the site though there had been in the past.

2.2.3 Site Characteristics

The site is gently sloping in a broadly south-west to north east direction. The highest point of the site is located in the south western corner of the site adjacent to the gatehouse of Goldenbridge Cemetery at 27.5m OD. The ground level falls by approximately 1m along the length of the boundary wall to Goldenbridge Cemetery to 26.5m OD at the south eastern corner of the site. Levels fall to approximately 24m OD adjacent to the Community Sports Centre across a length of c. 240m-this equates to an average fall of approximately 1 in 70 across the main open space of the site.

The gradual fall continues across the northern portion off the site up to the boundary with Emmet Road. At this point, the fall in level is more pronounced with the boundary wall forming a retention structure to maintain the high levels on the site than on the road. This is characterised by a 1.5m level drop from the grounds around the Celtic Pigeon Club to the public footpath along Emmet Road. This level difference is less pronounced to the front of the Health Centre and the ground slopes down at the entrance to provide vehicular access from Emmet Road.

2.2.4 Previous Uses

The site of the proposed development has a long history of previous uses. It originally formed part of the Richmond Barracks-a British Army Barracks first occupied in 1814. Following the formation of the Irish Free state, the barracks changed into Irish hands in 1922 and remained in use as a barracks until its closure in 1925. Subsequently the site was handed over to Dublin Corporation with the development of Keogh Square purpose-built residential accommodation in 1947. A large-scale social housing development known as St Michaels Estate was completed in the 1970s consisting of a number of tower blocks. The buildings were in use up until the early 2000s with demolition of the various blocks being undertaken between 2004 and 2013.

2.2.5 Existing Buildings/Structures on the subject site

The site currently comprises of a mixture of brownfield areas which previously housed the St Michaels Estate development together with buildings permitted for demolition under a separate Part 8 development (Planning Reg. Ref. 2221/21) as follows:

- St Michael's Community Centre
- Eve Tuiscint Health Centre

In addition, the Inchicore Community Sports Centre comprises a two-storey structure constructed in the early 2000s which will remain in place and the design of the proposed development has been formulated to take into account this existing community resource.

The north western corner of the site is delineated by a section of historic walling, which previously formed the boundary of the Richmond Barracks. The wall is approximately 60m in length with frontage onto St Vincent Street West and Emmet Road. The wall is approximately 3.5m in height along St Vincent Street West with the top of wall dropping to be approximately 2.5m above footpath level at the junction with Emmet Road.

Inchicore Community Sports Centre

Adjacent to the project site, the Sports Centre consists of a two-storey structure with a portion of the centre consisting of a double height sports hall. The building measures approximately 30m x 45m on plan with highest roof level approximately 10m above surrounding ground levels. The building was constructed in the early 2000s and is currently in use as a sports centre and creche, together with ancillary uses.

2.2.6 Buildings/uses of note in the vicinity of the subject site

Civic Uses include:

- Richmond Barracks
- Goldenbridge Cemetery, including gatehouse and mortuary chapel
- Inchicore Primary Care Centre
- St. Michaels Church

Residential Uses include:

- Thornton Heights (social housing, apartment development along with Family Resource Centre)
- Tyrone Place (social housing, apartment development)
- Davis Court Social housing
- Bulfin Court (senior citizen housing)

2.2.7 Existing Buildings/Structures on and in the vicinity of the subject site

Figure 2.3 – Adjacent Uses



Note: Site Outline excludes works on public road

Richmond Barracks

Built in 1810 in response to the threat of a French invasion in the Napoleonic Wars, it was one of the British Army's largest barracks in Dublin at the time. (Nearly every British Regiment would spend time at the Richmond Barracks fighting in conflicts including the Crimean War, the Boer War, and World War 1.)

After the 1916 Easter Rising, Richmond Barracks would become a centrepiece in the fight for Irish Independence, housing over 3,000 suspected rebels before their sentencing. When the site was turned over to the Free State Army in 1922, it ultimately included a housing estate and a Christian Brothers' School.

In 2016, major refurbishment works were completed on Richmond Barracks as part of a Dublin City Council Community Partnership to restore and commemorate the heritage of the building. Richmond Barracks is now also home to a library, garden, and Culture Connects, a programme of cultural activities that celebrate the experiences and interests of the local communities and people.

The buildings that remain of the original barracks are located on the eastern side of Patriots Path. They are currently occupied in part by the HSE to form part of Inchicore Primary Care Centre with the remaining elements converted in recent times to use as a museum.

Inchicore Primary Care Centre

The Primary Care Centre is part of the original Richmond Barracks built in 1810 and offers a number of health services to the local community including Public Health Nurses, Physiotherapists, Occupational Therapists, Dental Services and Mental Health Services

Goldenbridge Cemetery

To the south of Richmond Barracks the Goldenbridge Cemetery was established following Catholic Emancipation and was established in 1828. It is significant in that it is the first Catholic Cemetery established post Catholic Emancipation in the 1820's predating Glasnevin. It is beautifully laid out with a wonderful neo-classical mortuary chapel, designed walkways and planting and surrounded by high walls with a small 2-storey gate lodge at its entrance and much of it has been recently restored. The site is significant for both its architectural features and its social and political history. It also has to be acknowledged that the site has changed considerably over time, particularly after the Barracks ceased to be used post-independence, and the majority of the barracks buildings and grounds were lost.

Thornton Heights

Thornton Heights is located to the south east of the site. It is a social housing development completed by Dublin City Council in 2014 and consisting of 75 units in a mix of 5-6 storey apartment blocks and 2 storey terraced housing.

Our Lady of Lourdes Primary School

This school is located to the south-east of the site. It comprises a two-storey permanent structure together with a two storey prefabricated structure along the St Vincent Street West elevation.

Tyrone Place

Tyrone Place consists of 3 blocks of apartments 5 storeys tall located directly to the west of the site.

Bulfin Court

Bulfin Court is located to the east of the site and is a housing development for senior citizens. It consists of a series of 8 blocks with a mixture of single and two storey structures.

St. Michaels Church

St Michaels Church is located to the north east of the site. The structure was originally constructed as the garrison church for Richmond Barracks before becoming a catholic church for the people of Inchicore in 1926. The structure consists of a cut stone building set in church grounds surrounded by low level railings.

2.3 DESCRIPTION OF THE PHYSICAL CHARACTERISTICS OF THE WHOLE PROPOSED DEVELOPMENT

2.3.1 Main Characteristics of the Operational phase of the project

The application for approval to An Bord Pleanála under Section 175 of the Planning & Development Act 2000 (as amended) (the Act) is accompanied by detailed drawings prepared by BMCEA Architects for the proposed scheme.

The proposed development has been comprehensively described in the public notices accompanying the submission to An Bord Pleanála. A Site Layout Plan is detailed in Figure 2.4. A summary of the description and nature of development is provided hereunder:

“The development will comprise 578 no. apartments, consisting of 110 no. studio apartments, 172 no. 1 bedroom apartments, 250 no. 2 bedroom apartments (including 17 no. duplex apartments) and 46 no. 3 bedroom apartments (all apartments/duplexes to have balconies or terraces), community hub/library, creche, supermarket, 5 no. retail/café/restaurant/class 2 financial services units & 2 no. café/restaurant units), a public plaza fronting onto Emmet Road and the installation of a new watermain c 200m in length along Emmet Road to the junction with Tyrconnell Road/Grattan Crescent. The proposal includes works to a protected structure (8705 - Richmond/Keogh Barracks, relating to works to rubble stone boundary wall). The proposed development will consist of and includes:

- A) *In the southern portion of the site (‘Main Residential Area 01’ - Block A), comprises a courtyard perimeter building (306 no. apartments consisting of 76 no. studio apartments, 100 no. 1 bedroom apartments, 104 no. 2 bedroom apartments and 26 no. 3 bedroom apartments as well as a management office c. 59 sq. m) in a series of blocks as follows: Block A1 - 5 storeys (35 no. apartments), Block A2 - 7 storeys (55 no. apartments), Block A3 - 5 storeys (39 no. apartments), Block A4 – 5 storeys (20 no. apartments), Block A5 – 7 storeys (54 no. apartments), Block A6 – 5 storeys (37 no. apartments with café/restaurant at ground floor c. 80 sq. m), Block A7 – 7 storeys (54 no. apartments), and Block A8 – 3 storeys, (6 no. apartments/ 6 no. duplex units);*
- B) *In the central portion of the site (‘Main Residential Area 02’ - Block B), comprises a courtyard perimeter building (181 no. apartments consisting of 24 no. studio apartments, 43 no. 1 bedroom apartments, 103 no. 2 bedroom apartments and 11 no. 3 bedroom apartments) in a series of blocks as follows: Block B1 – 5 storeys over partial below ground partial basement level (33 no. apartments) with an adjacent 2 storey creche of c. 816 sq. m with associated play areas, Block B2 – 7 storeys (54 no. apartments), Block B3 – 3 storeys (4 no. apartments/4 no. duplex units), Block B4 – 5 storeys (38 no. apartments), Block B5 – 7 storeys (48 no. apartments), including 2 no. duplex units fronting onto internal street, as well as provision of energy centre with associated plant/switch rooms and water storage/plant space (at partial below ground/basement level);*
- C) *In the northern portion of the site – the provision of a commercial mixed use Block C (5 storeys with 7 storey element) consisting of 91 no. apartments (10 no. studio apartments, 29 no. 1 bedroom apartments, 43 no. 2 bedroom apartments & 9 no. 3 bedroom apartments – including 5 no. duplex apartments fronting onto internal street), communal open space at third floor level, supermarket (including off-licence) of c. 2,476 sq. m GFA (c. 1,765 sq. m net retail sales area) at first floor level, with ground floor café/restaurant (c. 205 sq. m), 5 no. units (retail/café/restaurant/class 2 financial services floorspace c. 564 sq. m – to be amalgamated/subdivided as required);*
- D) *In the northern portion of the site the provision of a community hub/library of c. 2,810 sq. m (4 no. storeys) with flexible internal meeting rooms/spaces including internal double height halls as well as roof garden/terrace areas at second and third floor (roof levels);*
- E) *A new Vehicular access (as well as new adjacent service access) will be provided from St. Vincent’s Street West into the undercroft level of Block C (with 3 no. internal streets provided between St. Vincent’s Street West and “Patriot’s Path” and Thornton Heights along boundary with Goldenbridge cemetery). The proposal also provides 106 no. car parking spaces, 8 no. motorcycle spaces as well as 1,285 no. cycle spaces within the blocks and single storey external covered store as well as surface spaces. (At undercroft level of Block C, the development includes 54 no. car parking spaces, 5 no. motorcycle spaces and 104 no. cycle spaces);*
- F) *Provision of 3 no. main areas of public open space and a “sports zone” area adjacent to the existing Inchicore Sports Community Centre c. 0.72 hectares as well as communal open space for the residents within the blocks;*
- G) *The proposal includes works, and alterations (including reduction in height, removal of sections, and provision of new openings) into the existing rubble stone wall (a protected structure no. 8705);*

- H) The development includes water main upgrade along the Emmet Road from the subject site for c. 200m to to the junction with Tyrconnell Road/Grattan Crescent and tie in works surrounding the site;
- I) The development will also provide for all associated works and infrastructure to facilitate the development, including accommodation works, site clearance, hard and soft landscaping (to tie into existing streets), ESB substations, bin storage, green roofs, solar panels, heat pump systems (at roof level), play equipment, attenuation areas and connection to foul and surface water drainage and water supply, and construction access will be from St. Vincent's Street West and Patriot's Path as required."

The main development site comprises c. 3.72 hectares bounded generally by Emmet Road to the north, Goldenbridge Cemetery to the south, "Patriot's Path" and Richmond Barracks to the east and St. Vincent's Street to the west and also includes upgrade water supply works along Emmet Road to Blackhorse Bridge. The proposal entails works to a protected structure (8705 - Richmond/Keogh Barracks, relating to rubble stone boundary walls).

The relevant chapters of the EIAR provide further detail on the specific characteristics relating to the particular environmental factors.

Table 2.1 – Summary of Key Site/Development Statistics

Site Area	4.86 ha. (including Irish Water main upgrade) 3.72 hectares main development site (net area) 3.89 hectares (including Taken in Charge Areas)
Land Use Zoning 2016-2022 City Plan	Z14 <i>"To seek the social, economic and physical development and/or rejuvenation of an area with mixed use, of which residential and 'Z6' would be the predominant uses."</i>
Land Use Zoning 2022-2028 Draft City Plan	Z14 <i>"To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use"</i> .
No. of Apartments	578
Density	155 units per hectare (based on 2.72 ha site).
Creche	816 sq. m
Community Hub/Library	2,810 sq. m
Retail Neighbourhood Shop	2,476 sq. m GFA (c. 1,765 sq. m net retail sales area)
5 no. retail/retail service units	564 sq. m
2 no. Café/restaurant units	285 sq. m
Public Open Space	7,230 sq. m 19.4% of 3.72 ha. (3,720 sq. m required – DCC CDP). Emmet Place 3,166 sq. m Richmond Place 1,165 sq. m Goldenbridge Place 1,038 sq. m "Sports Zone" beside Inchicore Community Sports Centre 1,861 sq. m
Communal Open Space	4,307 sq. m (3,464 sq. m required Apartment Guidelines 2020)
Building Heights	3-7 storeys
Car Parking	106
Motorcycle spaces	8
Bicycle Parking	1,285
Total Gross Floor Area	56,838 sq. m

Source: BMCEA Schedule of Areas

2.3.2 Demolition

The demolition of the existing buildings on the site to facilitate the mixed-use development has been approved under a separate approval (Planning Reg. Ref. 2221/21) under Part 8 of the Planning and Development Act, 2000, as amended, and therefore approval for this element of the project is not being sought as part of the current application under section 175 of the Planning and Development Act, 2000; notwithstanding this the environmental effects associated with these demolition works have been included in the assessment undertaken as part of this EIAR.

The works include:

- the demolition of the health care centre (demolition to commence and spoil removed from site; material to be recycled;
- the demolition of the Community Centre (demolition to commence and spoil removed from site; material to be recycled;
- demolition of hard standing areas on former Traveller halting site, spoil etc., to be removed from site.
- removal of internal site walls, grubbing up of all foundations and removal of hard surfaces

2.3.3 Residential and Non Residential Summary

The following table provides a summary of the overall dwellings mix within the Part 10 development.

Table 2.2 – Overall Dwelling Mix

Unit type	Studio	1 bedroom	2 bedroom	3 bedroom	
Total	110	172	250	46	578
Overall Mix	19%	29.8%	43.3%	7.9%	100%

Source: BMCEA Schedule of Areas

The supporting community and commercial elements of the proposed development (of some 6,951 sq. m) will comprise:

Table 2.3 – Summary of Proposed Cultural/Community and Commercial Elements

Use	Area
Creche	816 sq. m
Library/Community Hub	2,810 sq. m
2 no. Café units	285 sq. m
Supermarket	2,476 sq. m
5 no. Retail/Retail Related Service units	564 sq. m
Total	6,951 sq. m

Note: Excludes ancillary management office.

Figure 2.4 – Layout of Project Site

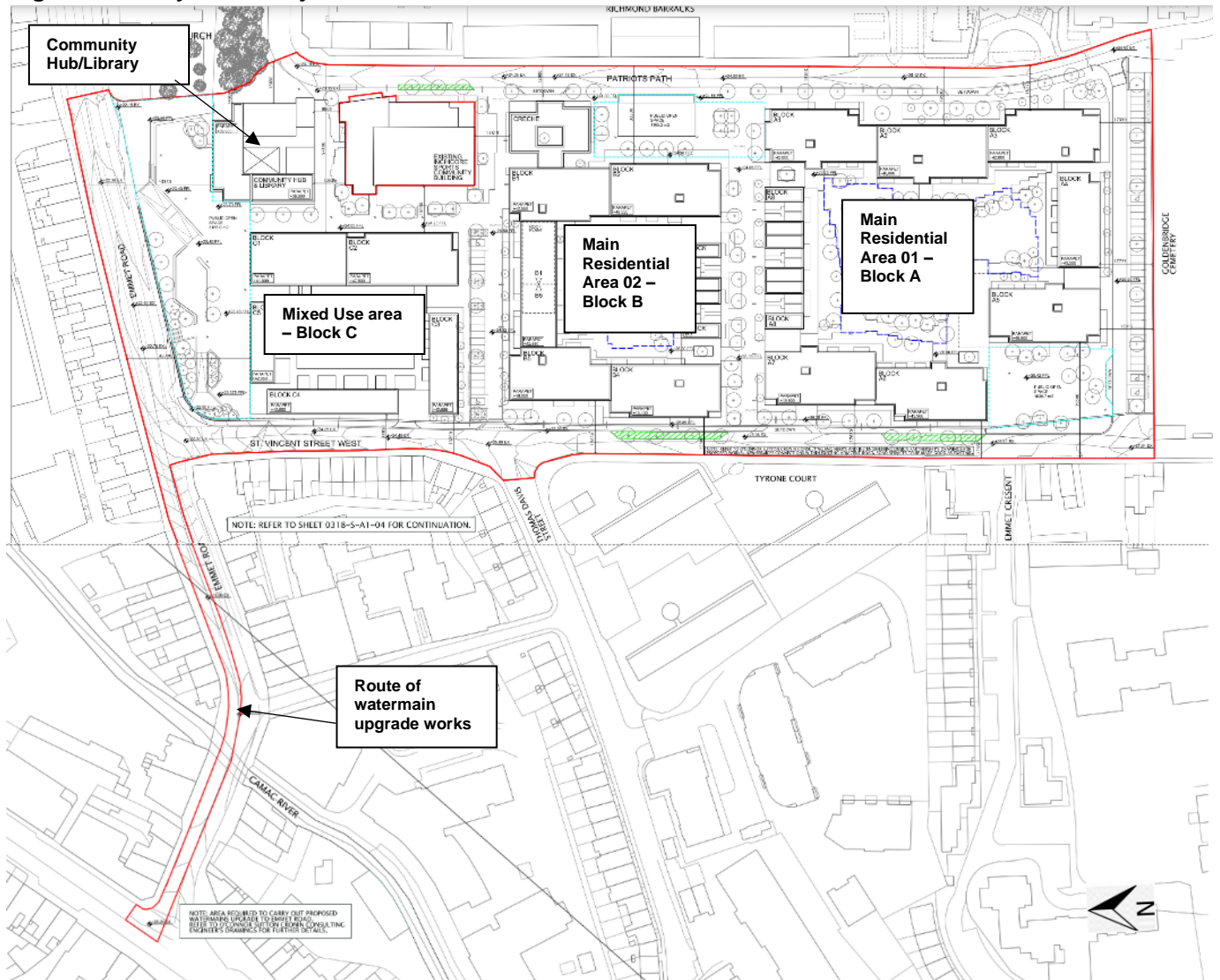
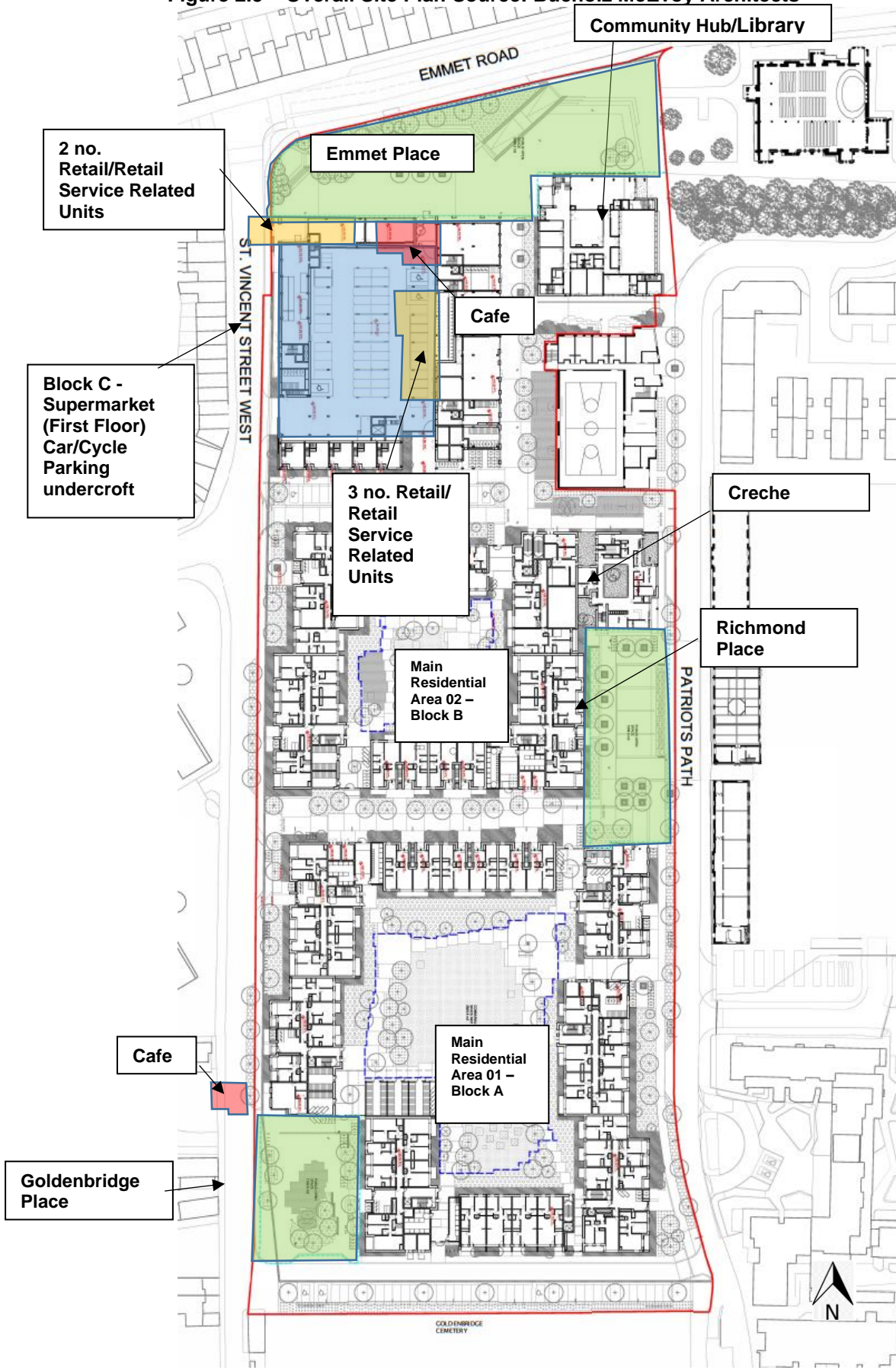


Figure 2.5 – Overall Site Plan Source: Bucholz McEvoy Architects



Note: Names on Open Spaces indicative and for illustration

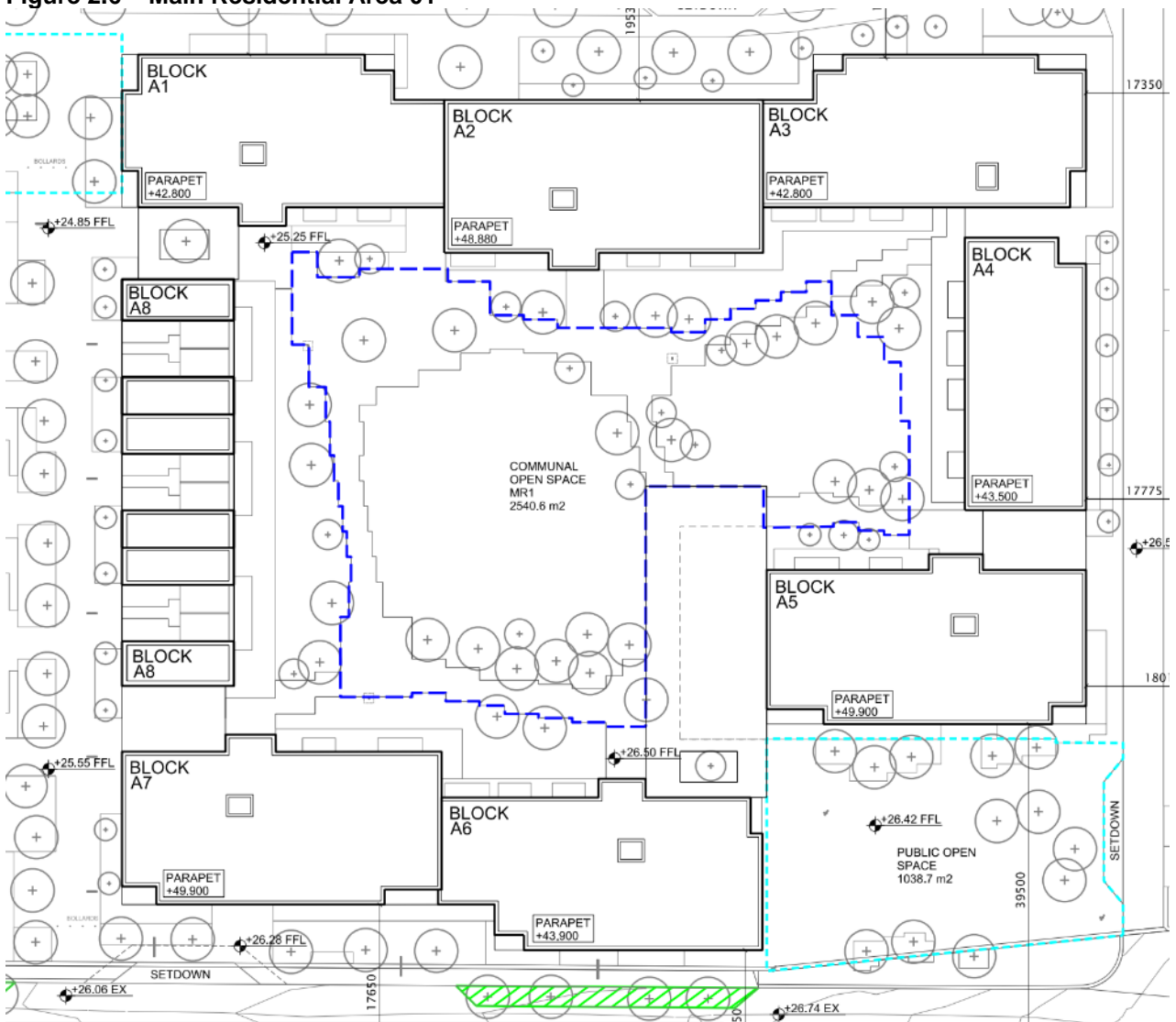
2.3.4 Main Residential Area 01

In the southern portion of the site ('Main Residential Area 01'), comprises a Courtyard perimeter building in a series of blocks consisting of:

'Block A' (306 no. apartments comprising 76 no. studio apartments, 100 no. 1 bedroom apartments, 104 no. 2 bedroom apartments and 26 no. 3 bedroom apartments as well as a management office) as follows:

- Block A1 - 5 storeys (35 no. apartments),
- Block A2 - 7 storeys (55 no. apartments),
- Block A3 - 5 storeys (39 no. apartments),
- Block A4 - 5 storeys (20 no. apartments),
- Block A5 – 7 storeys (54 no. apartments),
- Block A6 - 5 storeys (37 no. apartments with café at ground floor c. 80 sq. m),
- Block A7 - 7 storeys (54 no. apartments), and
- Block A8 - 3 storeys, (12 no. apartments including 6 no. duplex units);

Figure 2.6 – Main Residential Area 01



Source: BMCEA

The southern part of the site includes a public open space area (Goldenbridge Place c. 1,039 sq. m), which is surrounded by active frontages which include a café c. 80 sq. m (at ground floor level of Block A6) and the entrance areas to the communal open space to the north and to the adjacent blocks to the east. Further detail is provided below and in the BSLA Landscape Report.

Within Main Residential Area 01 there is a centrally located area of communal open space for residents of c. 2,540 sq. m (1,766 sq. m required as per Apartment Guidelines 2020).

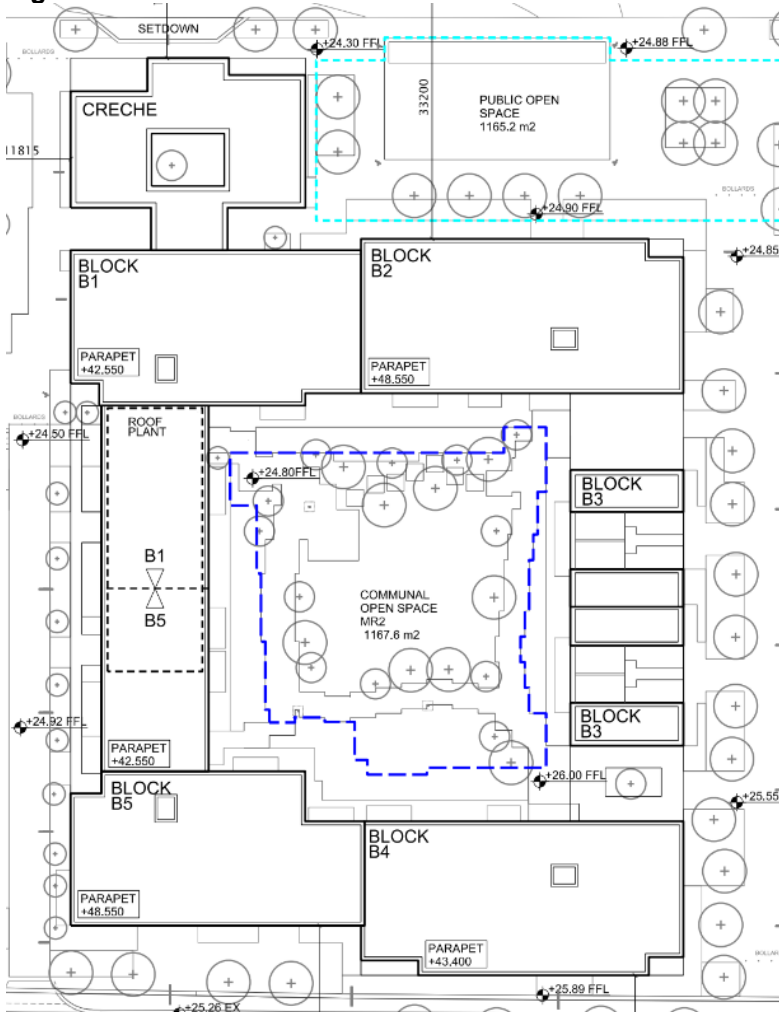
2.3.5 Main Residential Area 02

In the central portion of the site (*'Main Residential Area 02' Block B*), comprises a Courtyard perimeter building in a series of blocks consisting of:

Block B (181 no. apartments comprising 24 no. studio apartments, 43 no. 1 bedroom apartments, 103 no. 2 bedroom apartments and 11 no. 3 bedroom apartments) as follows:

- Block B1 – 5 storeys over partial below ground partial basement level (33 no. apartments) with an adjacent 2 storey creche of c. 816 sq. m with associated play areas,
- Block B2 – 7 storeys (54 no. apartments),
- Block B3 – 3 storeys (8 no. apartments including 4 no. duplex units),
- Block B4 – 5 storeys (38 no. apartments),
- Block B5 – 7 storeys (48 no. apartments), as well as provision of energy centre with associated plant/switch rooms and water storage/plant space (at partial below ground partial basement level);

Figure 2.7 – Main Residential Area 02



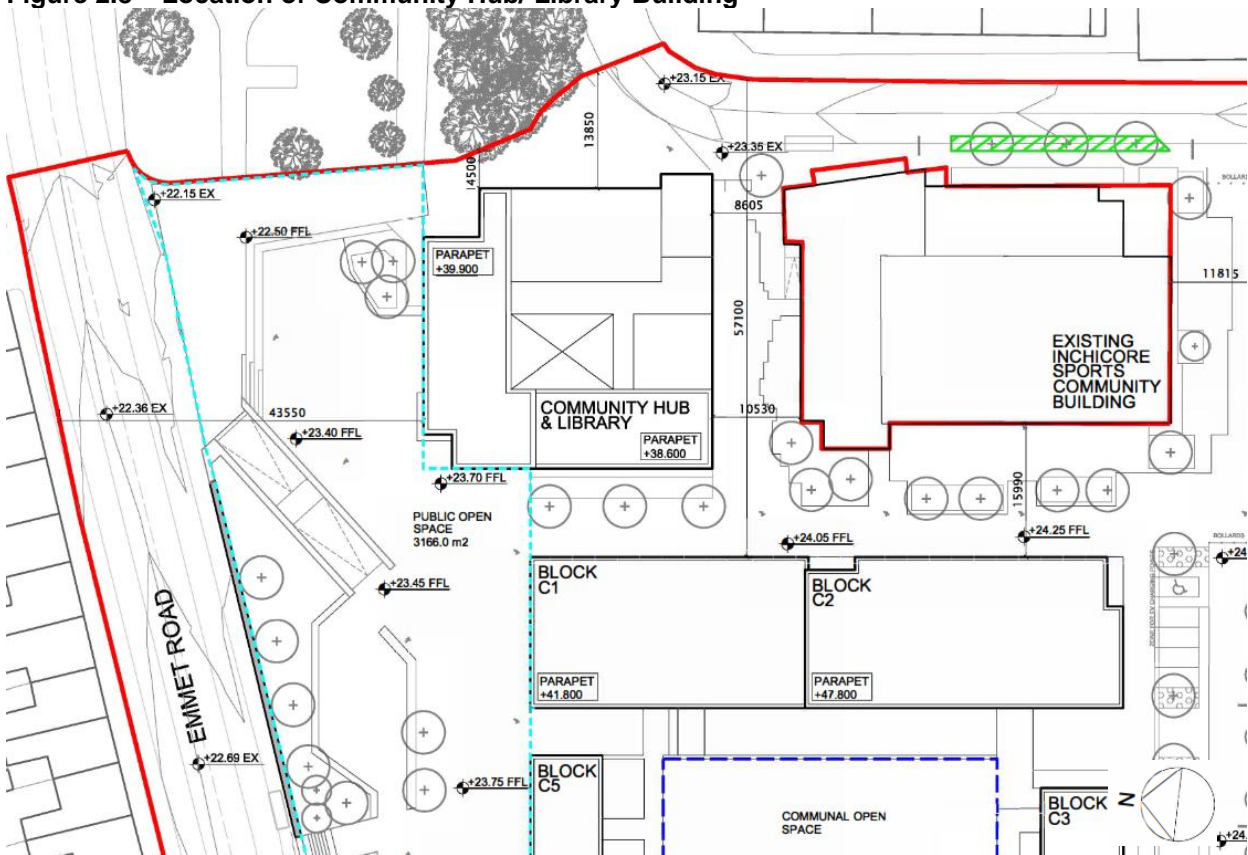
Source: BMCEA

Within Main Residential Area 02 is a centrally located area of communal open space of c. 1,167 sq. m (1,131 sq. m required as per Apartment Guidelines 2020).

2.3.6 Community Hub/Library

It is proposed to provide a Community Hub/ Library Building (4 no. storeys) of c. 2,810 sq. m. The building offers an opportunity to co-locate community facilities, a public Community Hub/Library, with mutual benefits arising from the synergies between both. The building presents its main façade to the new civic plaza opening up to Emmet Road, framed by St. Michael’s church and the remains of Richmond Barracks boundary wall. A shared corner entrance addresses both the civic plaza and the north-south pedestrian route on its western façade.

Figure 2.8 – Location of Community Hub/ Library Building



Internally the building is organised around a central double height space shared by Library and Community Hub users, which offers a gathering and orienting space for small events, information evenings etc. The large multi-purpose hall with flat floor can facilitate both sports and larger group activities (with ample storage for demountable stage and seating for temporary performance use directly adjacent).

The Library element along the northern side comprises casual journal reading area at entrance level, children’s library at first floor, with teenagers and adult reference and study spaces at the upper levels. A high ceilinged reading space overlooking the civic plaza comprises the top level. The community Hub comprises a range of different sized meeting and activity spaces to accommodate various group sizes for community groups, with shared break-out and ancillary spaces organised around the central space. Shared roof gardens offer planted spaces for relaxation, with places to sit in the sun, with views of the tree canopy and Richmond Barracks on the East.

Figure 2.9 – Emmet Road Frontage



2.3.7 Mixed Use Development Area – Block C

Located to the west of the Community Hub/Library building the northern portion of the project site includes the provision of a mixed-use block (5 storeys with a 7 storey element) consisting of 91 no. apartments (10 no. studio apartments, 29 no. 1 bedroom apartments, 43 no. 2 bedroom apartments & 9 no. 3 bedroom apartments), communal open space at second floor level along with a supermarket of c. 2,476 sq. m GFA (c. 1,765 sq. m net retail sales area, including off-licence area), café (c. 205 sq. m), 5 no. retail/retail service units (c. 564 sq. m), with undercroft car and cycle parking.

Figure 2.10 – Location of Block C

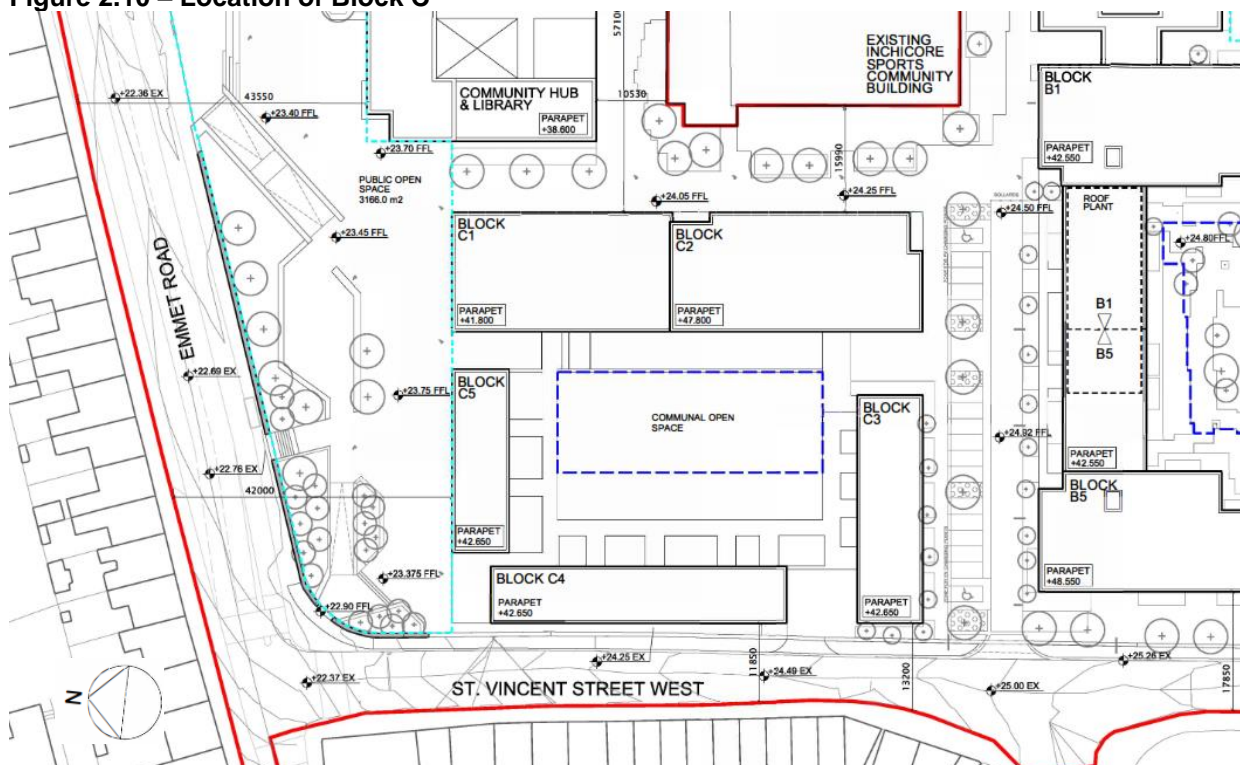
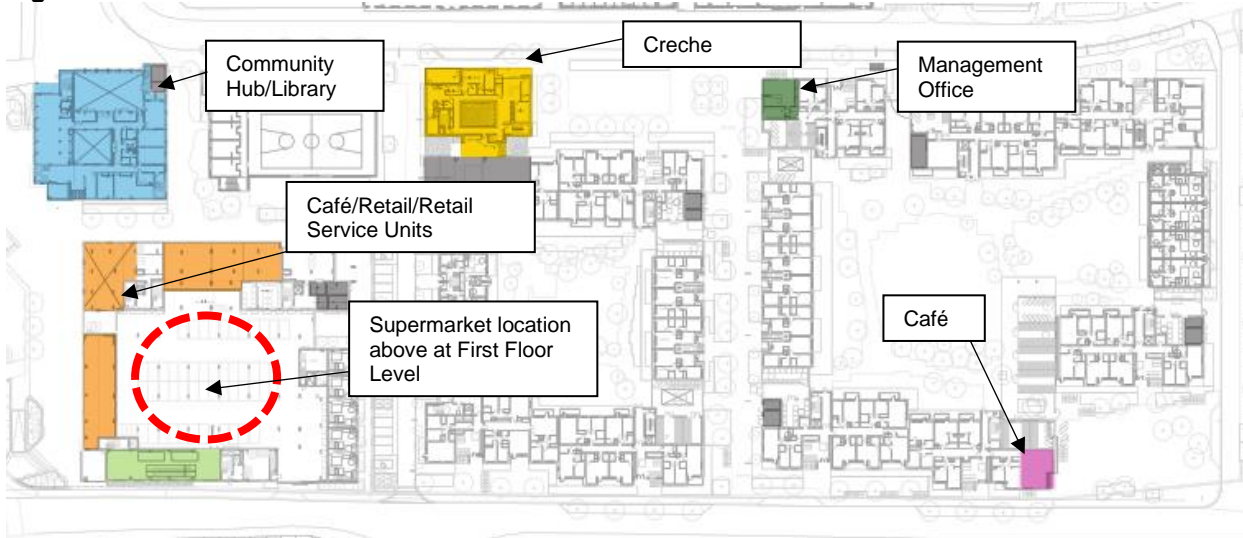


Figure 2.11 – Location of Non-Residential Uses



2.3.8 Neighbourhood Shop (Supermarket)

At first floor level, the mixed-use building provides a Supermarket of c. 2,476 sq. m GFA (c. 1,756 sq. m net retail sales area, including off-licence area). The mixed-use building will comprise a supermarket at first floor level, a village carpark below on ground floor level, five retail/commercial units at ground floor level with two facing Emmet Road along the North façade and two facing the Library /Community Hub building and the existing Sports Community Building, as well as 91 residential apartment units.

The communal open space is located on the roof of the supermarket and accessed via the cores and galleries provided. Screens are provided along the gallery decks to provide privacy to the individual apartments from the residences.

Along the southern edge the residential block consists of own door accessed duplex units at the ground floor, with gallery accessed units above. Along the western edge the residential block sits above the escalator to the grocery store with the residential entrance being located at the centre of the block. Along the eastern edge the residential units sit above the café and retail spaces; there are two residential entrances to the blocks above which start at first floor level. The dedicated residential bicycle parking is located adjacent to the entrances consistent with the approach taken generally on the development.

The undercroft Village Carpark is accessed from St. Vincent Street West in the southern portion of the block, Immediately adjacent to the carpark entrance is the truck loading bay access; a roller-type gate will be used to close both the carpark and truck loading bay after hours and will be able to close the truck loading bay when it is not in use. The carpark is naturally ventilated and naturally lit thanks to the large openings provided along the north south axis.

2.3.9 Café/Retail/Retail Related Service units

It is proposed to provide a mixture of commercial units in the development comprising 2 no. café/restaurant units as well as 5 no. retail/retail service units (c. 564 sq. m). In the northern part of the site, the proposed cafe c. 205 sq. m is located to the west of the proposed Community Hub/Library building and fronts onto Emmet Place presenting an active frontage which will provide animation and activity and enhanced passive surveillance.

In addition it is proposed to provide 5 no. retail/retail service units either side of the proposed café, which includes 2 no. retail/retail service units fronting onto Emmet Place and 3 no. retail/retail service units located along the internal north/south pedestrian link, located between the community hub/library/(existing Inchicore Sports Centre) and Block C.

In the southern part of the site, it is proposed to provide a café unit of c. 80 sq. m which will front onto the Goldenbridge open space located beside the cemetery.

2.3.10 Crèche

Located centrally within the development, it is proposed to provide a creche of c. 816 sq. m, which will front onto the Richmond Barracks open space.

The creche has capacity to serve the development proposal. In accordance with the publication “*Childcare Facilities - Guidelines for Planning Authorities*”, 2001, provision has been made for 20 no. childcare spaces per 75 no. residential units, excluding 1 bed and studio units. The creche can cater for c. 79 no. childcare spaces but could cater for more children depending on final layout and breakdown of children (as composition impacts on floorspace required per child).

2.3.11 Management Office

The management office (c. 59 sq. m) is located centrally within the scheme at ground floor of Block A1 which fronts onto Richmond Place.

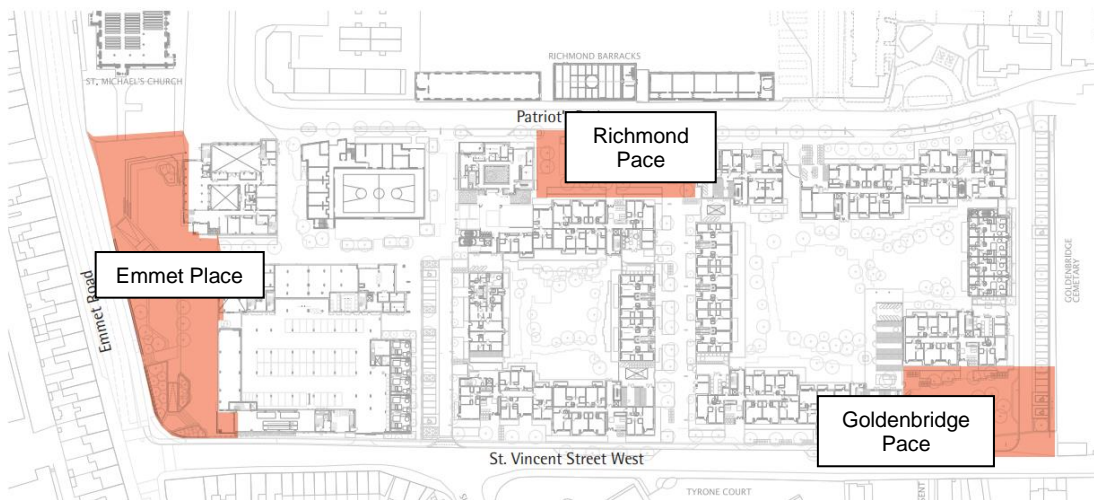
2.3.12 Public Open Space

It is proposed to provide three new public spaces, Emmet Place, Richmond Place, and Goldenbridge Place, and activates the north-south connection between Emmet Place and Richmond Place. (Note: Placeholder names above used for the purpose of drawing/planning reference only. Formal naming to follow post planning as part of consultation)

2.3.13 Public Open Space

It is proposed to provide three new public spaces, Emmet Place, Richmond Place, and Goldenbridge Place (Note: Placeholder names above used for the purpose of drawing/planning reference only.)

Figure 2.12 – Location of Main Public Open Space Areas



To the north, south, west and of the existing Inchicore Community Sports Centre building new “parklets” are offered to enhance the level of flexible urban use focused on the young adult and teen. These three edges provide an element of ‘parcours’ (see Landscape report for details), which are carefully separated from pedestrian access to the retail units at ground floor of the commercial block, the fire tender access zone to the south.

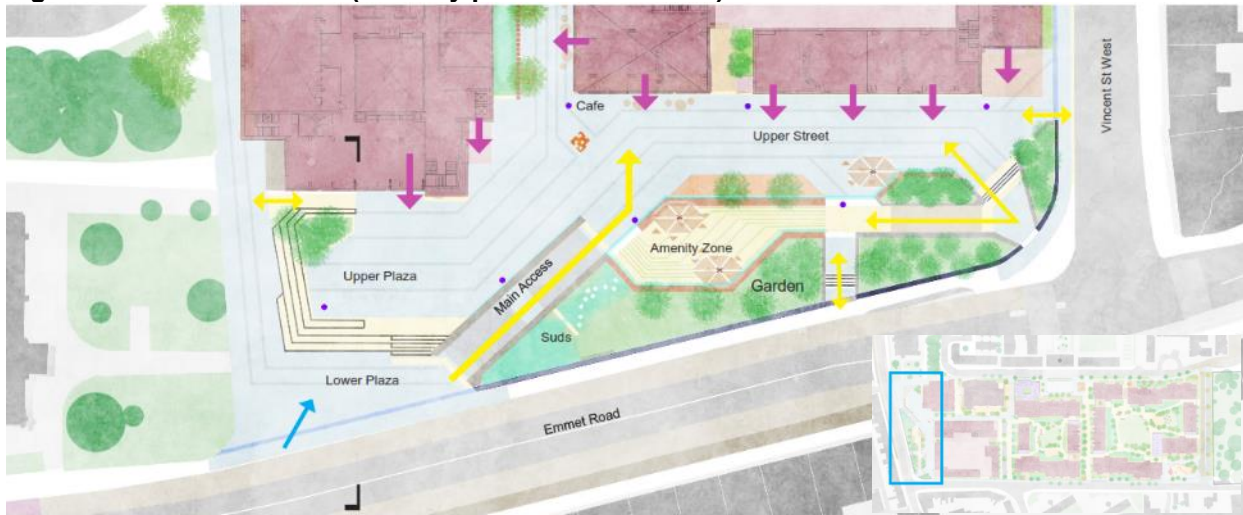
Figure 2.13 – Play Areas Age Classifications and Types Overview



2.3.13.1 Public Open Space Emmet Place (Place holder name)

Located along the northern extent of the site, fronting Emmet Road it is proposed to provide a substantial area of open space comprising some 3,166 sq. m in extent.

Figure 2.14 – Emmet Place (with key plan location insert)



Emmet Place along the norther frontage of the site relates to the busiest street bounding the site in Emmet Road, thereby building on this activity to encourage further public life. The new builds will face Emmet Road and create new street frontage with the supermarket, cafe and retail, as well as the community hub/ library building facing onto it, attracting footfall. The plaza is bounded on the other two sides by St. Michaels’ Church as the eastern backdrop, and the preserved barracks wall to the west. The space itself is designed to encourage day-to-day life while also allowing the flexibility of organised events, and also to increase the nature value in the site, with a garden sheltered behind the heritage wall.

2.3.14 Public Open Space - Goldenbridge Place (Place holder name)

The southern part of the site includes a public open space area (Goldenbridge Place c. 1,038 sq. m), which is surrounded by active frontages which include a café c. 80 sq. m (at ground floor level fronting onto the space).

Figure 2.15 – Goldenbridge Place (with key plan location insert)



2.3.15 Richmond Barracks Open Space (Richmond Place - place holder name)

The central part of the site includes a public open space area (Richmond Barracks Open Space c. 1,404 sq. m), which is surrounded by active frontages which include a crèche and the entrance areas to the communal open space to the west. The open space provides an appropriate area to integrate with the entrance to Richmond Barracks to the east.

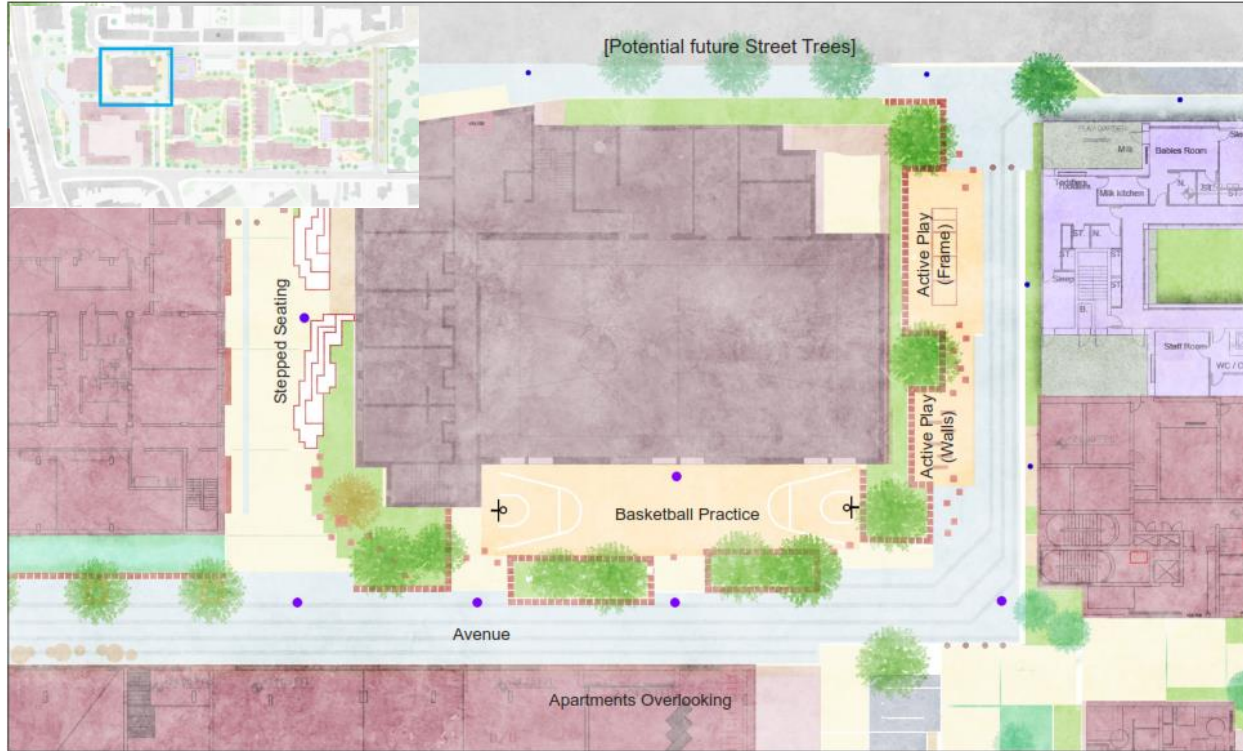
Figure 2.16 – Richmond Place (with key plan location insert)



2.3.16 Integration of Existing Inchicore Community Sports Centre into the Layout

An important amenity on the site is the play provision for older children/ teenagers, and in conjunction with the youth consultations, it was agreed that the environs around the existing Sports Hall would be a very suitable spot. Currently the building presents the surroundings with tall, mostly blank facades, that are not the most inviting interfaces. A key outcome of the proposed scheme would be to soften this impression and to help integrate this building into the wider landscape masterplan.

Figure 2.17 – Existing Inchicore Community Sports Centre (with key plan location insert)



2.3.17 Communal Open Space Areas

In the mixed-use Block C, it is proposed to provide communal open space for the residents of some 600 sq. m above the supermarket at second floor level as shown below.

Figure 2.18 – Communal open space (Please refer to BSLA material for layout)



Communal Open space is also provided within the courtyards of the main residential blocks (Blocks A & B). The Communal Open space is accessible only to residents. Privacy buffer gardens protect the private amenity space of

the ground floor units from the communal open space. There are two double-height residents only entrances provided, one along the northeast edge of the middle courtyard building (Block B) and one along the eastern edge of the southern courtyard building (Block A). These openings provide important visual connections between the public open space and the communal open space.

Within Main Residential Area 01 there is a centrally located area of communal open space for residents only of c. 2,540 sq. m (1,766 sq. m required as per Apartment Guidelines 2020).

Within Main Residential Area 02 is a centrally located area of communal open space for residents only of c. 1,167sq. m (1,131 sq. m required as per Apartment Guidelines 2020).

2.3.18 Private Amenity Space

All residential units within the scheme are provided with private amenity space in the form of balconies on upper floors or private patio/terrace at ground floor level which meet and exceed the minimum required areas set down in Appendix 1 of the Apartment Guidelines.

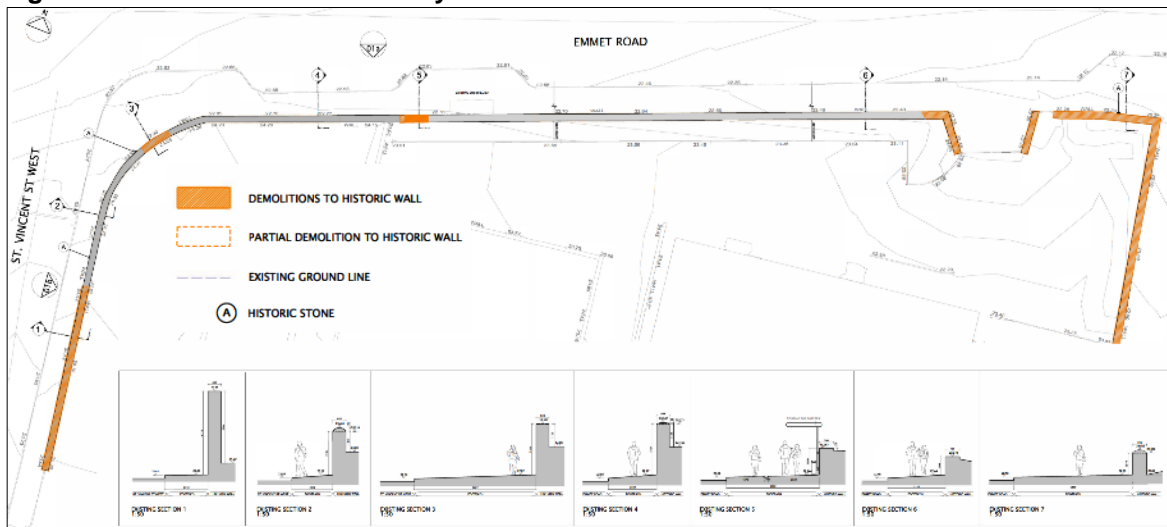
2.3.19 Lighting Strategy

The landscaping proposals include a Lighting Strategy, and this is supported by an External Lighting Design Report prepared by IN2. The overarching principle of the strategy is to create a safe night-time environment, ensuring no undue harm to neighbouring residents, and including bat friendly lighting. The lighting columns indicated are to be agreed post planning.

2.3.20 Works to Boundary Wall (a protected structure)

Located at the north eastern part of the subject lands the boundary wall associated with Richmond Barracks presents an opportunity and also a constraint in relation to the proposed development. With regard to the opportunity for the proposed development, what remains of the wall has the potential to provide legibility and inform future residents and visitors to the subject site of the long history associated with the site. The constraints in relation to the wall relate primarily to the lack of permeability and as a barrier to movement in the north western corner of the site, reducing the interaction with the existing neighbourhood. In addition, the wall also presents potential difficulties with regard to passive surveillance. Noting the above, the proposal includes for some discrete interventions to the wall to provide permeability, which will entail some removal of the protected wall. We refer the Board to Chapter 14 of the EIAR, prepared by Blackwood Associates for the Architectural Heritage impact assessment.

Figure 2.19 – Location of Boundary Wall



2.3.21 Access

Vehicular access to the site is provided from Emmet Road directly to the site, via Saint Vincent Street West to the west of the site and via Bulfin Road/Patriots Path to the east of the site. Pedestrian links are also provided on these routes with additional pedestrian linkages via public paths along the Grand Canal to the south of the site.

2.3.22 Parking

2.3.22.1 Car Parking

The proposal also includes 106 no. car parking spaces comprising 50 no. car parking spaces for the residential and the remainder allocated to the other uses including accessible spaces car share spaces and 10% Electric Vehicle charging points. The Village car parking spaces (54 no.) will be predominantly provided in a Village Mobility Hub located beneath the Supermarket. 2 no car parking spaces will also be located adjacent to Goldenbridge Cemetery

2.3.22.2 Cycle Parking

It is proposed to provide 1,285 no. bicycle spaces as follows:

Community Hub & Library	30
Supermarket	28
Retail / Commercial / Café	8
Creche	10
Residential in Commercial Mixed Use - Block C	152
Main Residential - Block A & B	768
Residential Visitors in Commercial Mixed Use - Block C	46
Main Residential Visitors - Block A & B	243
Bicycle Parking / Storage Subtotal	1,285

2.3.23 Surface Water Drainage

2.3.23.1 Existing

Two main storm drains are identified serving the site. The first is a 300mm diameter concrete sewer which travels along the western boundary of the site before travelling in a westerly direction along Thomas Davis Street West. The Irish Water record drawings indicate that this sewer previously gathered storm drainage from St Michaels Estate. However, the drawings from the demolition of St Michaels Estate and the results of the GPR survey indicate that these connections may have been removed. It is noted that there are discrepancies between the findings of the GPR survey and the record drawings in terms of the plan location and alignment of this sewer-this will need to be further reviewed/verified on site. It is also noted that the sewer passes onto the site in a number of locations. Thus, a permanent diversion of same may be required to facilitate the development.

The second dedicated storm sewer is a 375mm diameter concrete sewer which travels along Patriots Path to the eastern boundary of the site This sewer later becomes a 450mm diameter sewer before travelling under Emmet Road and to the rear of Richmond Park to discharge to the Camac River. Again, the Irish Water Record drawings indicate that this sewer previously gathered storm drainage from St Michaels Estate. However, the drawings from the demolition of St Michaels Estate and the results of the GPR survey indicate that these connections may have been removed.

2.3.23.2 Proposed

It is proposed to separate the surface water and wastewater drainage networks, which will serve the proposed development, and provide independent connections to the local surface sewer network and local wastewater sewer network respectively. The development will discharge treated and attenuated (to greenfield equivalent rate) rainfall runoff to the adjacent public surface water networks, that discharge to the River Camac.

The site and its surroundings are well served by dedicate/separate storm drainage network. Two main storm drains are identified serving the site. The first is a 225mm-diameter concrete sewer which travels along the western boundary of the site. This sewer later becomes a 300mm-diameter sewer before travelling in a westerly direction along Thomas Davis Street West. The Irish Water records drawings indicate that this sewer previously gathered storm drainage from Saint Michael's Estate. However, the drawings from the demolition of Saint Michael's Estate

and the result of the GPR survey indicate that these connections may have been removed. It is also noted that the sewer passes onto the site in a number of locations. Thus, a permanent diversion of same is proposed to facilitate the development.

The second dedicated storm sewer is a 375mm-diameter concrete sewer which travels along Saint Michael's Estate to the eastern boundary of the site. This sewer later becomes a 450mm-diameter sewer before travelling under Emmet Road and to the rear of Richmond Park to discharge to the Camac River. It is also noted that the sewer passes onto the site in a number of locations. Thus, a permanent diversion of same is proposed to facilitate the development.

The overall development is to be separate into two individual surface water catchments based on the natural topography of the development site and due to the proposed mix of uses of the proposed development:

- Residential catchment-located to the south of the site and consisting of Blocks A and B
- Commercial catchment to the north of the site Commercial Mixed Use, Community Hub and Library

It is proposed that both catchments will drain to the diverted surface water sewer along Patriots Path. The residential catchment will be connected to the 375mm diameter section of sewer in front of the Primary Care Centre. The commercial catchment will connect to the 450mm diameter sewer in the north-eastern corner of the development.

Sustainable Drainage Systems are to be provided, and these are discussed in more detail in *Section 3.5 of the Engineering Service Report*, with discharge rates from site being restricted to the greenfield equivalent runoff rate, for design rainfall events up to, and including, the 1% AEP, in accordance with the Dublin City Development Plan and the GSDS.

The development's new surface water networks are to typically comprise a gravity pipe network, with significant Sustainable Drainage Systems implemented, -please refer to the Engineering Services Report, B967-OCSC-XX-XX-RP-C-0006

The typical traditional and Sustainable Drainage Systems (SuDS) provided, all of which have been designed in accordance with CIRIA C753, the SuDS Manual, and the design guidance material listed in Section 2 of this report, are listed and detailed in order of general sequence within the drainage network, as follows:

- Pervious Paving
- Green Roofs
- Trapped Road Gullies
- Filter Drains
- Underground Pipe Network
- Silt Traps
- Cellular Storage systems, with interception
- Bio Retention / Detention ponds
- Outlet Protection
- Flow Control Device (to control run-off at greenfield run-off rate of 5l/s/ha or 19l/s for the site)
- Oil Separator

Refer to the Engineering Services Report, B967-OCSC-XX-XX-RP-C-0006 for further detail on each SuDS measure mentioned above.

The overall surface water drainage system, serving both catchments in the proposed development, is to consist of a gravity sewer network that will convey runoff from the roofs and paved areas to the outfall manhole. The new gravity networks will discharge a controlled attenuated flow rate to both the existing public network (southern catchment) and the open ditch / stream at the north-western corner of the site (northern catchment).

The proposed piped network has been designed in accordance with BS EN 752 and all new infrastructure is to be compliant with the requirements of the GSDS and the GDR COP for Drainage Works, with minimum full-bore velocities of 1.0 m/s achieved throughout.

All main surface water carrier pipes have been sized to ensure no surcharging of the proposed drainage network for rainfall events up to, and including, the 1 in 5-year ARI event.

Each catchment is to attenuate its own rainfall runoff, prior to discharging to the main development network. The primary function of the attenuation systems will be to temporarily store excessive rainfall runoff, during significant rainfall events, due to the restricted discharge rates (to greenfield equivalent runoff rates) from the development outfalls.

Attenuation is to be provided in the form of a cellular storage under the hard landscaped areas, prior to discharging the attenuated flows to the development's main surface water network.

A minimum total storage volume of 2,650 m³ is to be provided as part of the proposed development, which is spread across a number of lined cellular systems and open ponds.

All attenuation systems have been designed to temporarily store the surface water runoff for design rainfall events up to, and including, the 1% AEP (1-100 year flood event) with a 10% increase in rainfall intensity, along with the associated integrated surface water drainage network.'

Please refer to OCSC drawing B967-OCSC-ZZ-GF-DR-C-0500 for detail on the proposed surface water drainage layouts.

2.3.24 Foul Sewer

Foul sewers are located to both the western and eastern boundaries of the site. There are 2no. foul sewers located along St Vincent Street West. The sizes are not identified on the Irish Water records, but the larger sewer been determined as a 375mm diameter sewer becoming a 1600mm brick arch sewer. The second sewer is identified as a 300mm diameter combined sewer that travels under the grounds of the Pigeon Club onto Emmet Road. This has been labelled as a storm sewer on the utilities survey which may indicate the foul flow into same would have been from the St Michaels Estate buildings.

The foul sewer to the east of the site runs along Patriots Path. This consists of a 225mm diameter travelling in a northern direction along the eastern boundary of the site. The sewer serves a number of adjoining developments including Richmond Barracks, Inchicore Primary Care Centre, Inchicore Community Sports Centre, Inchicore, St Michaels Community Centre and Eve Tuiscint Health Centre amongst others. Both the record drawings and utilities survey confirm that this sewer becomes a combined sewer before discharging to the combined sewer along Emmet Road.

The proposed development is to be served by a gravity wastewater drainage network ultimately discharging to the existing wastewater sewers located at the eastern boundary of the site.

The foul sewer to the east of the site runs along Saint Michael's Estate. This consists of a 225mm-diameter travelling in a northern direction along the eastern boundary of the site. The sewer serves a number of adjoining developments including Richmond Barracks, Inchicore Primary Care Centre, Inchicore Community Sports Centre, Saint Michael's Parish Community Centre and Eve Tuiscint Health Centre amongst others. Both the record drawings and utilities survey confirm collaborate that this sewer becomes a combined sewer before discharging to the combined sewer along Emmet Road.

It is proposed that the existing sewer be diverted slightly to the east to facilitate the proposed development.

It is proposed to separate the wastewater and surface water drainage networks, which will serve the proposed development, and provide independent connections to the adjacent local wastewater and surface water sewer network infrastructure, respectively. Refer to *Section 3 of the Engineering Services Report* for details of the proposed surface water drainage design strategy.

The overall development is to be separated into three individual gravity wastewater catchments based on the natural topography of the development site and due to the proposed mix of uses of the proposed development:

Southern Residential Catchment-consisting of Block A

Northern Residential Catchment-consisting of Block B

Commercial Catchment – consisting of Commercial Mixed Use, Community Hub and Library

Connections to the diverted 225mm diameter sewer are to be provided at 3 separate locations along Patriots Path.

The envisaged peak flow from the proposed development is 10l/s.

The proposed wastewater network is designed in accordance with the *Irish Water's Code of Practice for Wastewater Infrastructure (Revision 2 – July 2020)*.

Please refer to OCSC drawing B967-OCSC-ZZ-GF-DR-C-0500 for detail on the proposed foul drainage layouts.

2.3.25 Water Supply and Distribution

There are a number of existing watermain services identified on the Irish Water Record drawings as serving the Emmet Road site. These include:

- 3-inch asbestos pipe supply to Eve Tuiscint Health Centre and Pigeon Club grounds;
- 3-inch asbestos pipe supply to Saint Michaels Community Centre and Inchicore Community Sports Centre;
- 4-inch asbestos pipe supply to northern portion of the original St Michaels Estate building. This main links a 4-inch asbestos pipe main on St Vincent Street West and a 3-inch asbestos pipe supply on Patriots Path;
- 4-inch asbestos pipe supply to central portion of the original St Michaels Estate building. This main links a 4-inch asbestos pipe main on St Vincent Street West and a 3-inch asbestos pipe supply on Patriots Path;
- 2no. 4-inch asbestos pipe feeds on the southern portion of the site. Again, these mains link watermains on St Vincent Street West and Patriots Path. Sections of these mains also supply Thornton Heights development.

In addition to the above, the record drawings indicate a separate 110mm MOPVC supply along Bulfin Road and Patriots Path. This main is indicated to supply Inchicore Primary Care Centre and/or Richmond Barracks

It is noted that the demolition drawings for St Michaels Estate indicate that a number of the above watermains may have been removed as part of the demolition works.

There are a number of existing watermain services identified on the Irish Water Record drawings as serving the Emmet Road site. The primary existing watermain is a 150mm PVC main along St Vincent Street West which is fed from a 6-inch ductile iron main along Emmet Road. There are a number of smaller size mains which cross the site—these would have served the previous St Michaels Estate development on the site. The proposed development will require the decommissioning of these watermains within the footprint of the proposed new structures together with diversions of existing mains crossing the site.

It is proposed that all connections for the proposed development be from the existing 150mm diameter main along St Vincent Street West. 3no. separate connections are proposed with:

- 1no. connection serving Block A
- 1no. connection serving Block B
- 1no. connection serving Commercial Mixed Use, Community Hub and Library

A pre-connection enquiry has been submitted to Irish Water and a Confirmation of Feasibility subject to upgrades has been received. It is required that an approximate 180m length of the 6-inch watermain along Emmet Road be upgraded to a 200mm diameter pipe to facilitate the proposed development.

The envisaged peak water demand for the proposed development is 18l/s.

Please refer to OCSC drawing B967-OCSC-ZZ-GF-DR-C-0550 for detail on the proposed watermain layouts.

2.3.26 Irish Water Upgrade

The proposed development also will entail the upgrade for approximately 200m of existing 6" water main to 200mm on Emmet Road to the junction of Tyrconnell Road/Grattan Crescent.

It is unlikely that the works would have the potential to impact upon water quality, given that the route is located within the existing public road. The construction of the pipelines will be to Irish Water specifications and the construction management (including the implementation of appropriate mitigation measures as set out in the relevant chapters of the EIA, Chapter 5 and Chapter 6) will ensure that there are no significant impacts arising.

2.4 DESCRIPTION OF THE MAIN CHARACTERISTICS OF THE OPERATIONAL PHASE OF THE PROJECT

Pursuant to the EIA Directive an EIA document is required to set out a description of the project processes, activities, materials and natural resources utilised; and the activities, materials and natural resources and the effects, residues and emissions anticipated by the operation of the project.

The proposed development is a mixed use residential development including associated infrastructural works, creche areas of open space. The primary direct significant environmental effects will arise during the construction stage. As a result, post-construction, the operation of the proposed development is therefore relatively benign and not likely to give rise to any significant additional impacts in terms of activities, materials or natural resources used or effects, residues or emissions which are likely to have a significant impact on population and human health, biodiversity, soils, water, air, climate, or landscape.

The primary likely and significant environmental impacts of the operation of the proposed development are fully addressed in the EIA document; and relate to Population and Human Health, Landscape and Visual Impact and Noise and Air impacts associated with the traffic generated.

The proposed development also has the potential for cumulative, secondary and indirect impacts particularly with respect to such topics as traffic – which in many instances – are often difficult to quantify due to complex inter-relationships. However, cumulative secondary and indirect impacts are unlikely to be significant and are addressed in the content of this EIA document.

2.4.1 Energy Statement

The IN2 Energy Analysis report enclosed with the application sets the technologies employed to achieve compliance with the building regulations Part L and NZEB standards.

2.4.2 Environment / Global Issues

Increasing levels of greenhouse gases have been linked with changes in climate and predicted global warming. By far the biggest human contribution to the greenhouse gases is in emissions of carbon dioxide.

To minimise the embodied emissions impact, materials will be sourced locally where possible (reducing carbon dioxide emissions associated with transportation), and preference will be given to reusing materials, and using materials in their natural state (reducing the emissions associated with processing). Chapter 7 of the EIA sets out the potential impacts and mitigation in respect of Air Quality and Climate.

2.4.3 Utilities

Gas Elements of gas mains (low pressure) are identified on Gas Networks Ireland record drawings crossing the site in a number of locations. These include original service connections to St Michaels Estate but also assumed live feeds to Inchicore Primary Care Centre and Thornton Heights. Elements of these services were also identified on the utilities survey.

ESB Elements of power supply cables are identified on ESB record drawings crossing the site. These include service connections to the previous St Michaels Estate buildings, but it is unclear if these include supply to Richmond Barracks or not.

Eircom A review of partial records from Eircom have identified a number of services on and surrounding the site.

2.5 AN ESTIMATE, BY TYPE AND QUANTITY, OF EXPECTED RESIDUES AND EMISSIONS DURING THE CONSTRUCTION AND OPERATION PHASES

Details of an estimate, by type and quantity of expected residues and emissions during the construction and operational phases of the project are outlined in Chapters 3-15 which deal with ‘Aspects of the Environment Considered’. The following provides a summary to be read in conjunction with the relevant chapters.

2.5.1 Land and Soils

The development will require the excavation of soils and removal of soils from site as part of the design. There are a number of effects on the land and the geological and hydrogeological environments that will occur due to the proposed development, namely:

- Land take in the case of the proposed development – change of use from greenfield/brownfield to mixed use/commercial. However, this constitutes a return to previous residential land use.
- Soil excavation for both the proposed development and the watermain upgrade.
- Accidental spills, contaminated run-off, and/or contaminated groundwater discharged to sewer during the construction phase on both sites as well as piling on the development site have the potential to have an impact on the land and the geological and hydrogeological environments.

Topsoil

Removal of the existing topsoil layer will be required across the development site. It is expected that a portion of the stripped topsoil will be reused on site for landscaping of back gardens and public open spaces, if suitable for reuse. Expected volumes of stripped topsoil for disposal and reuse is detailed below:

2.5.2 Soil Excavation

Estimated bulk excavation volumes for the development are estimated at 35,289 m³ as shown in **Table 2.20**.

Figure 2.20 – Estimated Bulk Excavation Volumes

	TOTAL	Apartments	Creche	Tranche 5	Undercroft	Library	Site Works
Bulk Excavation							
Pile arisings	7,603	4,967	196	488	1,476	476	n/a
Reduced level	18,761	4,922	302	364	926	617	11,630
Reduced level (below ground plant space)	1,815	1,815	n/a	n/a	n/a	n/a	n/a
Trenches	3,278	2,108	124	167	455	424	n/a
Pile caps	3,832	2,665	76	279	796	16	n/a
TOTAL	35,289						

Where feasible, excavated material will be reused as part of the site development works (e.g., use as fill material beneath apartments and roads). However, surplus soils will require off-site disposal at appropriate disposal facilities.

Where contaminated soils/materials are discovered or occur as a result of accidental spillages of oils or fuels during the construction phase, these areas of ground will be isolated and tested in accordance with the 2002 Landfill Directive (2003/33/EC) for contamination, and pending the results of laboratory WAC testing, will be excavated and exported off-site by an appropriately Permitted Waste Contractor holding an appropriate Waste Collection permit and that this hazardous material will be sent for appropriate treatment / disposal to an appropriately Permitted / Licenced Waste Facility.

2.5.3 Construction Waste Disposal Management

A Project Specific Resource and Waste Management Plan (RWMP) has been prepared by Byrne Environmental as a stand-alone report to accompany the application.

The Material Assets – Waste Management (Chapter 11) outlines the following estimate in relation to construction waste generation.

Table 2.4 – Predicted Construction Waste Generation

Description of Waste	Tonnes to be generated
Metals	123
Concrete, Brick, Tile, Gypsum	341
Bituminous mixtures	62
Mixed C&D waste	213
Soils & Stones	52,670
Total	53,409

The calculated construction waste tonnage with the exception of soils and stones has been derived from the Building Research Establishment Environmental Assessment Method (BREEAM) which specifies that 11.1 tonnes of construction waste is generated for every 100m² of development area.

Chapter 11 of the EIAR (Material Assets – Waste Management) and the Construction and Demolition Waste and By-Product Management Plan, prepared by Byrne Environmental, included with the application, provides detail on the construction related waste management for the proposal, including the demolition of the existing structures on the subject site (as part of the permitted Part 8 – Planning Reg. Ref. 2221/21).

The Material Assets – Waste Management (Chapter 11) outlines the following estimate in respect of the demolition of the structures on the subject site (relating to Planning Reg. Ref. 2221/21).

Table 2.5 – Predicted Demolition Waste Generation

Demolition Waste Type	Predicted tonnage to be produced
Concrete & Blocks	1,974
Metals	2
Asphalt	1,904
Total	3,853

Figures referenced from Garland Report and Survey dated February 2021 Planning Reg. Ref. 2221/21)

The Objective of the Waste Resource Management Plan is to minimise the quantity of waste generated by construction activities, to maximise the use of materials in an efficient manner and to maximise the segregation of construction waste materials on-site to produce uncontaminated waste streams for off-site recycling.

The Waste Management Plan shall be implemented throughout the construction phase of the development to ensure the following:

- That all site activities are effectively managed to minimise the generation of waste and to maximise the opportunities for on-site reuse and recycling of waste materials.
- To ensure that all waste materials are segregated into different waste fractions and stored on-site in a managed and dedicated waste storage area.
- To ensure that all waste materials generated by site activities are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed / permitted facilities in compliance with the Waste Management Act 1996 and all associated Waste Management Regulations.

The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

2.5.4 Operational Phase - Domestic Municipal Waste/Waste Management

Chapter 11 of the EIAR (Material Assets – Waste Management) and the Operational Waste Management Plan, prepared by Byrne Environmental, provides detail on the domestic waste management for the proposal.

Chapter 11 outlines that a value of 1.6kg of waste generated per person per day has been therefore assumed for the purposes of this report to estimate the volume of waste to be generated at the proposed fully occupied development

as detailed below. Residential waste quantities in litres and m³ have been evaluated with regard to *British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice*.

Table 2.6 – Calculated domestic waste composition Residential Development

Unit	Per Day	Per Week
Kg	19,272	134,904
Litres	8,760	61,320
m ³	8.7	61

Non-Residential waste quantities have been evaluated with regard to *British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice* as detailed in Table 2.7.

Table 2.7 – Non-Domestic waste generation per week

Unit	Litres Per Week
Supermarket	11,250
5 no. Retail/Retail Services Units	4,320
2 no. Cafes	1,090
Creche	6,878
Community Hub /Library	1,000

The Objective of the Waste Management Plan is to maximise the quantity of waste recycled by providing sufficient waste recycling infrastructure, waste reduction initiatives and waste collection and waste management information to the residents of the development. The Goal of the Waste Management Plan is to achieve a residential recycling rate of 50% of managed municipal waste by 2020 in accordance with The Eastern-Midlands Region Waste Management Plan 2015-2021.

The Facilities Management Company shall employ an appropriately qualified and experienced staff member who will be responsible for all aspects of waste management at the development. All accommodation units shall be provided with a Waste Management Information document, prepared by the Facilities Management Company, which shall clearly state the methods of source waste segregation, storage, and recycling initiatives that shall apply to the Management of the development. This Information document shall be issued to all residential units on an annual basis.

2.5.5 Emissions

The scheme has been designed to provide thermally efficient buildings which will reduce the consumption of fossil fuels within each individual dwelling. This will reduce the impact the operational phase of the development will have on the micro and macro climate. In particular, there will be no “*traditional*” passive air vents in the apartments which are both thermally and acoustically inefficient. Exhaust Air Heat Pump systems shall be incorporated into the design of all units. These efficient energy reducing systems together with thermally rated window sets will reduce the potential future impacts that the external climate will have in terms of wind and changing temperatures on the internal environment within the residential units. These design features will ensure the units are thermally efficient thus reducing the use of fossil fuels leading to a reduction of the impact on the micro and macro climate.

The thermal efficiency of the buildings will ensure that the development will be sustainable and will be protected against the impacts of future climate change which may include storm events and prolonged colder periods during the winter season. These factors will contribute to reducing the impact the operational development has on the local and global climate which will ultimately contribute in a positive manner in reducing the impact on local and further afield human health. Chapter 7 of the EIAR sets out the potential impacts and mitigation in respect of Air Quality and Climate.

Noise may be considered in two separate stages, during construction, and when the development is operational. Construction related noise impacts are an inevitable short term limited inconvenience feature which, in general, is accepted by members of the public, subject to the standard controls typical of planning conditions attached to urban based development projects. These impacts can be reduced in a number of ways. It is standard practice to limit construction to normal working hours during the day. In addition, there are a number of regulations relating to noise

during construction which the contractor will be expected to adhere to throughout the construction phase. Chapter 8 of the EIAR sets out the potential impacts and mitigation in respect of Noise and Vibration.

2.5.6 Effluents

Effluent arising from foul drainage from the proposed development will be discharged through piped systems to the local authority sewers. Operation of the development will involve the discharge of uncontaminated surface water from the impermeable areas to a proposed network all linking into the established public system in the environs. Details of the impacts and mitigation measures for surface water and foul drainage are recorded at Chapter 6 of this Environmental Impact Assessment Report. Mitigation measures include measures designed to avoid, reduce, remedy or offset impacts. The proposed development will increase the quantity of foul drainage discharging to receiving foul sewerage network. The envisaged peak flow from the proposed development is 11l/s.

2.5.7 ESB Power

The development will require diversion of existing live underground services crossing the site and removal of redundant services which served previous developments on the subject site. All proposed power cables within the development will be underground or internal within the building. The estimated maximum demand for the proposed development is in the region of 2.7MVA. .

2.6 DESCRIPTION OF THE MAIN CHARACTERISTICS OF THE CONSTRUCTION PHASE

2.6.1 Introduction

It is estimated that the construction programme for the works associated with the proposed works will last in the order of 36-48 months from the date of commencement. This estimation is based on the typical construction programmes for other similar developments that are currently underway. In the event that the phases were not developed (due to unforeseen circumstances) the construction period may extend, having regard to the nature of the project and the need for flexibility, contractor pricing etc. It is important to note that the mitigation measures outlined in the EIAR will ensure that an extension to the construction period will not have a negative impact on the receiving environment. A Construction Management Plan has been prepared by OCSC Consulting Engineers and is included with the application, which includes further detail on timing and phasing. The CEMP will be developed and submitted to Dublin City Council prior to commencement of development and will include the mitigation measures set out in this EIAR.

This EIAR presents proposed mitigation measures to ensure that the planned development of the lands does not generate significant adverse impacts for residential and working communities in the vicinity of the site.

The proposed development, as described, is detailed on the planning application drawings and particulars which accompany the application.

Construction of the development the subject of this application for approval involves the following principal elements:

- Site strip. Earthworks associated with the construction of the houses and roads in the development.
- Construction of new buildings .
- Construction of roads, footpaths & hard/soft landscaping.
- Buried site services installation. Connection to public services.

In addition, the demolition of the existing structures, while already approved under a separate approval under part 8 of the Planning and Development Act 2001 as amended, is an integral part of the project and the environmental impacts associated with these works are included in the analysis and assessment presented in this EIAR.

2.6.2 Liaison with Neighbouring Properties

A monitoring regime will be put in place to protect neighbours & neighbouring properties with a full and detailed vibration, noise, dust and groundwater monitoring regime put in place for the duration of the works.



The Contractor will appoint a competent person to be referred to as the Surveying, Instrumentation and Monitoring Subcontractor (MSC) who will implement the monitoring measures during the construction phase described in this EIA.

The MSC will be responsible for preparing or organising the preparation of condition surveys of surrounding buildings, walls, hardstanding area etc. prior to the carrying out of any works on site. Extent of surveys to be agreed. The condition surveys will be carried out to a level of detail, suitable to the nature and extent of conditions encountered in order to obtain an understanding of the general structural condition of the property/structure and/or external environments.

It is proposed that vibration monitoring will be conducted at properties adjacent to or within 50m of the site as required using calibrated vibration monitors and geophones capable of transmitting live text and email alerts to ensure that if vibration levels approach or exceed specified warning and limit values.

2.6.3 Existing Ground Conditions

The development site is considered to be a brownfield site given the historic site use. An assessment of soil contamination and a waste classification were carried out for this site. An assessment of soil contamination and a waste classification were not carried out for the area of the watermain upgrades due to the access issues related to conducting an investigation within busy urban roads.

A total of 221 No. soil samples were obtained across the development site as part of the intrusive site investigation phase (2020) and submitted for analysis to Element Laboratories, a UKAS accredited laboratory, and IOM. Additionally, the soil analytical data was compared with a set of Generic Assessment Criteria (GAC) for Residential Use without Plant Uptake, Commercial and Public Open Space (Residential) end use as detailed in OCSC Generic Quantitative Risk Assessment (GQRA) Report which is included in Appendix C of this EIA. The GACs are an extremely useful screening tool in the assessment of risks from land contamination. When used in conjunction with the CSM they can streamline the risk assessment process by reducing the number of contaminants or pollutant linkages requiring more detailed risk assessment and, in many cases, can help demonstrate that there are no unacceptable risks at a site. The risk to construction workers is not considered under the GAC methodology but will be addressed in the Construction Environmental Management Plan (CEMP) and health and safety documentation for the site. It is assumed that health and safety guidelines will be adhered to, and appropriate health and safety planning/ assessments will be undertaken in advance of any on-site works.

In general, GACs are conservative screening criteria protective of human health. If the concentrations are below the GAC, then the risks to human health are considered negligible. If the concentrations are above the GAC, a potential risk to human health is identified and further assessment is required. The GACs are consistent with the principles of human health protection as detailed in Irish EPA, UK DEFRA, and UK Environment Agency guidance.

From the 221 No. samples, GAC exceedances consisted mostly of Total Petroleum Hydrocarbons (TPH), Polycyclic Aromatic Hydrocarbons (PAHs) and some metals in the form of arsenic and lead. These exceedances were typically associated with land use in the 'residential' scenario.

Based on the existing information, there is no risk to future commercial or residential receptors following site development.

It is anticipated that a number of the pathways of concern such as direct contact from metals will be broken due to the site redevelopment i.e., breaking the pathway by capping the soils with buildings or hardstanding.

Ground gas assessment showed low levels of ground gases yielding a site characterisation of CS1 which has a hazard potential of Very Low.

Refer to the GQRA (OCSC, 2020) for analytical soil and groundwater tabulated results contained in Appendix C Volume III of this EIAR.

2.6.4 Demolition

There are no demolition works proposed as part of the Part 10 development save for some interventions into the historic wall (to provide permeability for the scheme). Demolition works have been permitted under a Part 8 development under Planning Reg. Ref. 2221/21 and are assessed in the relevant chapters of the EIAR as they are an integral part of the construction sequence.

2.6.5 Main Stages/phases of Construction

In summary the construction of the development will involve the following:

- Demolition of the existing buildings on the subject site (relating to the permitted Part 8 2221/21)
- Site strip. Earthworks associated with the construction of the houses, duplex units, creche and roads in the development.
- Construction of new buildings - houses, duplex units & creche, including ancillary buildings such as bike stores, bins stores and an ESB substation.
- Construction of roads, footpaths & hard/soft landscaping.
- Buried site services installation.

Section 5.5 of the EIAR provides more detail on the construction phase.

2.6.5.1 Site Accommodation & Site Parking

On site accommodation will consist of:

- Staff welfare facilities (toilets, canteen, offices/meeting rooms,)
- Materials storage areas and drop off Temporary water supply, electricity supply and foul drainage will be required for the new facilities.
- Connections to electricity & water are available close to the site boundary.
- Foul drainage with need to be taken to a vented holding tank for regular removal by suction tanker.
- Limited parking (c. 40-60 spaces depending on stages of construction) for construction personnel will be provided within the site for the period of construction.
- The site is within walking distance of the main street which is served by a Dublin Bus route. The contractor parking areas will be contained within the construction compound.

2.6.5.2 Hours of Working

It is proposed that standard construction working hours should apply i.e.:

- 7am to 6pm Monday to Friday (excluding Bank Holidays)
- 8am to 3pm on Saturdays.

Any works proposed outside of these periods shall be strictly by agreement with the Local Authority in advance (such as Concrete pouring, foul or water main connections). Deliveries of material to site will be planned to avoid high volume periods. There may be occasions where it is necessary to make certain deliveries outside these times, for example, where large loads are limited to road usage outside peak times. There may be occasions where it is necessary to have deliveries within these times. The Contractor will develop, agree and submit a detailed Traffic Management Plan, to DCC, for the project prior to commencement. The TMP will implement the relevant mitigation measures contained in the EIAR.

2.6.5.3 Construction of Services

Following on from completion of site clearance, demolition, site re-profiling works construction activities will focus on the installation of underground utilities to provide the infrastructure required for storm water drainage, foul water drainage, water supply, power and building utility systems.

2.6.5.4 Temporary Construction Works

During the construction phase it will be necessary to provide contractor welfare facilities for the workers. A site office and staff welfare facilities will be installed at a suitable location centrally within the overall site as part of the construction compound. All surplus plant and materials shall be stored in this location when not in use. Welfare facilities will include a canteen, drying room, toilets and first aid. Power will be provided using a small petrol generator. The petrol generator and fuel storage containers used for various items of plant will be located within a sealed containment bund.

Temporary portable toilet facilities will be provided on site. These units will be maintained and the waste collected therein will be disposed of using an appropriate contractor. Storage areas will be clearly identified and agreed with all relevant parties in advance of construction.

2.6.5.5 Cranes Tower

Cranes will not be required on site. Mobile cranes may be used for some activities. All materials being lifted by crane will be controlled by guide ropes and will only be carried out under the strict supervision of appropriately qualified and experienced banksmen.

2.6.5.6 Hoarding and Site Segregation

The new works will be hoarded off or fenced off from the public at all times. A 2.4m minimum high plywood painted timber hoarding will be provided along the Cookstown Road boundary after tree/hedge removal here and at any other areas around the site where the perimeter fence/hedge is not deemed sufficient for safety and security reasons. Heras type fencing will be used on short term site boundaries where appropriate to suit the works. The hoarding alignment and specification are to be confirmed by the Contractor prior to commencement. Controlled access points to the site, in the form of gates or doors/turnstiles, will be kept locked for any time that these areas are not monitored (e.g. outside working hours). During working hours, a gateman will control traffic movements and deliveries at any active site access to ensure safe access and egress to & from site onto the public roads. All personnel working on site must have a valid Safe Pass card and be inducted by the Main Contractor with regard to site specific information.

2.6.6 Noise and Dust Management

The main contractor will be required to be accredited with ISO14001 Environmental Management Systems. The main contractor will be required to mitigate the impact of the construction works and the mitigation measures set out in this EIAR and CEMP.

2.6.7 Construction Traffic Management Plan

Construction Traffic Generation: The peak trip generation with respect to the construction stage is expected to relate to the removal of material from the site during both the demolition and construction stages when there will be additional HGV movements to and from the site. Utilising typical construction rates and allowing for site logistics and management, during the excavation stage, there could be a maximum of 10 no. truckloads per hour on a given site. However, the scale of demolition, site clearance and excavation on this site is limited meaning a lower average rate of 2 no. truck movements per hour is estimated, equating to 4 no. two-way HGV movements per hour. Assuming a 11-hour working day, this equates to 44 no. two-way HGV movements per day on the local road network. All suitable material will be reused for construction and fill activities where possible and appropriate. All spoil material will be removed to a registered landfill site in consultation with the local authority. In addition to the traffic generated by the disposal of surplus subsoil from the site, there will be traffic generated from construction staff and deliveries of construction materials and equipment though these will be spread across the course of the day limiting the potential impact during the peak hours in particular.

A Construction Traffic Management Plan (CTMP) will be developed by the main contractor and agreed with the Planning Authority and An Garda Síochána prior to commencement of development in the event of a grant of permission. The CTMP will implement the mitigation measures contained in this EIAR (including CEMP).

The mitigation will include the following matters:

- The contractor shall be responsible for and make good any damage to existing roads or footpaths caused by his own contractor's or suppliers transport to and from the site.

- The contractor shall at all times keep all public and private roads, footpaths entirely free of excavated materials, debris, rubbish, provide vehicle wheel wash and thoroughly clean all wheels and arches of all vehicles as they leave the site.
- The contractor shall confine his activities to the area of the site occupied by the works and the builders' compound, as far as practicably possible, during any particular phase of the development.
- Properly designed and designated entrance and egress points to the construction site for construction traffic will be used to minimise impact on external traffic.
- Flagmen shall be used to control the exit of construction vehicles from the site onto the public road, if required.
- Existing fire hydrants are to remain accessible as required.

Construction vehicle movements will be minimised through the implementation of the following measures contained in the CEMP, which forms part of the mitigation in this EIAR (See Appendix B Volume III of this EIAR):

- Consolidation of delivery loads to/from the site and scheduling of large deliveries to site to occur outside of peak periods;
- Use of precast/prefabricated materials where possible;
- 'Cut' material generated by the construction works will be re-used on site where possible, through various accommodation works.
- Adequate storage space on site will be provided;
- Construction staff vehicle movements will also be minimised by promoting the use of public transport.
- Car sharing among the construction staff following Covid-19 safety guidelines may be used to reduce traffic numbers. Public Transport: An information leaflet to all staff as part of their induction on site highlighting the location of the public transport services in the vicinity of the construction site.

2.6.8 Reinstatement / Road Cleaning

Prior to the works commencing, detailed photographic surveys (condition schedules) of adjoining walls, roads, footpaths, fences etc. is to be prepared. Copies of the relevant parts are to be made available to adjoining owners and DCC. This record will form the basis of assessing repairs to adjoining areas in the future should a dispute arise as to their cause. Roadways are to be kept clean of muck and other debris. A road sweeping truck is to be provided as necessary, to ensure that this is so.

Reinstatement at completion of the works will involve:

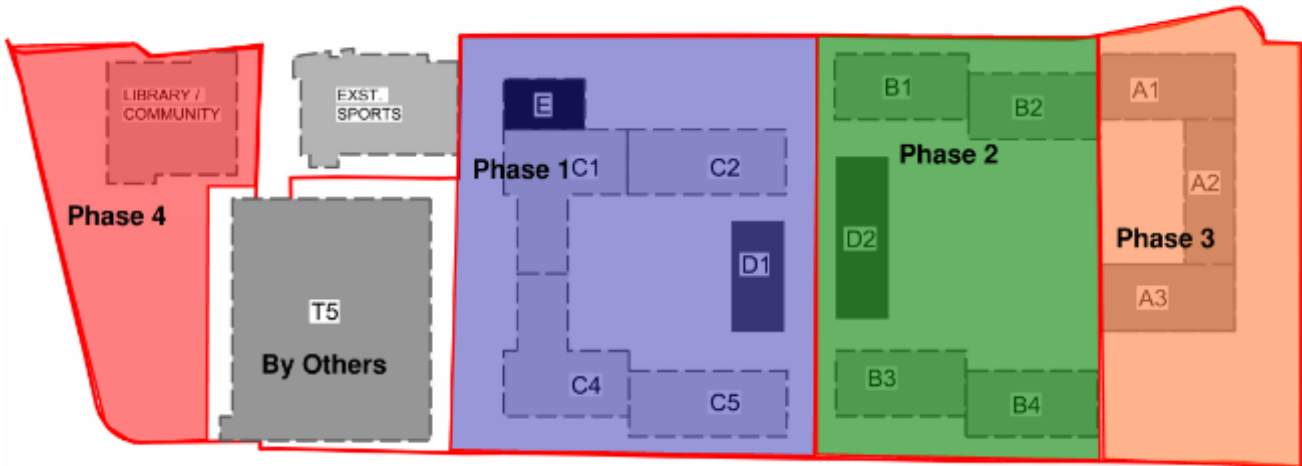
- Testing and cleaning of all watermains in the development to the requirements of the IW / DCC prior to connection to the public watermain. This will reduce the risk of contamination to the public water supply when the new network is connected to the system.
- Repair of any damage to any adjacent public roadways, kerbs, grass verges etc. in accordance with DCC requirements.
- Reinstatement of all excavations to the requirements of DCC.
- Leaving the area in a neat and clean condition, removing all deleterious materials that may have been deposited during construction works.

2.6.9 Construction Phasing

It is anticipated that construction will commence on site in Q2 2024 subject to the discharge of any pre-commencement requirements. Based on initial contracting feedback to date, an overall construction duration of circa 3-4 years would be reasonably achievable.

The delivery of the main residential/library portion will be delivered in one build but completed in sub phases. Those phases are likely to follow the below approach but subject to change when detailed design is carried out and contractor appointed. These are indicative sub phases of the main build contract.

Figure 2.21 – Proposed Phasing



The timeframes provided are indicative only and there is likely to be overlap between phases. Generally, the foundation and structural works of each phase is likely to proceed at the same time as the fit out and commissioning of the previous phase. The phasing plan as proposed is relevant to the current market and economic climate. Should circumstances change, then a revised (extended) phasing approach may be necessary. The phasing plan as proposed is relevant to the current market and economic climate. Should the current market significantly shift, then a revised phasing approach may be necessary.

It is noted the timing and sequency of the phases may be subject to change, depending on funding, but it is not considered that there would be any material impact on the assessment contained in the EIAR.

2.7 DESCRIPTION OF CHANGES TO THE PROJECT

The Guidelines on the information to be contained in environmental impact assessment reports were published by the EPA in May 2022.

The EPA EIAR Guidelines 2022 state in relation to change:

“Very few projects remain unaltered throughout their existence. Success may bring growth; technology or market forces may cause processes or activities to alter. All projects change and – like living entities – will someday cease to function. The life cycles of some types of projects, such as quarries, are finite and predictable. Such projects often consider their closure and decommissioning in detail from the outset, while for most projects a general indication of the nature of possible future changes may suffice. While the examination of the potential consequences of change (such as extension) does not imply permission for such extension, its identification and consideration can be an important factor in the determination of the application. Descriptions of likely changes may cover:

- *Extension*
- *Decommissioning*
- *Other Changes.”*

As per the draft EPA guidelines and in the interests of proper planning and sustainable development it is important to consider the potential future growth and longer-term expansion of a proposed development in order to ensure that the geographical area in the vicinity of the proposed development has the assimilative carrying capacity to accommodate future development.

Given the proposed site layout extent and the limitations of physical boundaries, adjoining land uses and land ownership the potential for growth of the proposed development is considered limited and confined primarily to potential minor domestic extensions which will have a negligible impact.

The parameters for the future development of the area in the vicinity of the subject site are governed by the Dublin City Development Plan 2016-2022 and the Draft Dublin City Development Plan 2022-2028. Any adjacent

undeveloped lands will be the subject of separate planning applications in the future, where they are identified as being suitable for development, and where the provision of the requisite physical and other infrastructure is available.

2.7.1 Description of Secondary and Off-Site Developments

No significant secondary enabling development is deemed necessary to facilitate the proposed development. The planning application includes details of the necessary road works, which are required to facilitate this development. These works are assessed within this Environmental Impact Assessment Report.

2.7.2 Risks of Major Accidents and/or Disasters

The surrounding context consists of a mix of residential, agricultural, employment, educational and open space public amenity lands. It does not include any man-made industrial processes (including SEVESO II Directive sites (96/82/EC & 2003/105/EC) which would be likely to result in a risk to human health and safety.

Article 3 of the Environmental Impact Assessment (EIA) Directive 2014/52/EU, requires the assessment of expected effects of major accidents and/or disasters within an EIA. Article 3(2) of the Directive states that *“The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned”*.

2.8 DIRECT AND INDIRECT EFFECTS RESULTING FROM USE OF NATURAL RESOURCES

Details of significant direct and indirect effects arising from the proposed development are outlined in Chapters 3-15 which deal with *‘Aspects of the Environment Considered’*. No significant adverse impact is predicted to arise from the use of natural resources.

2.9 DIRECT AND INDIRECT EFFECTS RESULTING FROM EMISSION OF POLLUTANTS, CREATION OF NUISANCES AND ELIMINATION OF WASTE

Details of emissions arising from the development together with any direct and indirect effects resulting from same have been comprehensively assessed and are outlined in Chapters 3-15 which deal with *‘Aspects of the Environment Considered’*. There will be no significant direct or indirect effects arising from these sources.

2.10 ALTERNATIVES EXAMINED

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

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

Article 94 and Schedule 6, paragraph 1(d) of the Planning and Development Regulations 2001, as amended, requires the following information to be furnished in relation to alternatives:

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

The presentation and consideration of various alternatives investigated by the project design team is an important requirement of the EIA process. This section of the EIAR document provides:

a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment.”

This serves to indicate the main reasons for choosing the development proposed, taking into account and providing a comparison of the environmental effects. Alternatives may be described at three levels:

- Alternative Locations.
- Alternative Designs.
- Alternative Processes.

The DHPLG 2018 EIA Guidelines state:

*“Reasonable alternatives may relate to matters such as project design, technology, location, size and scale. The type of alternatives will depend on the nature of the project proposed and the characteristics of the receiving environment. For example, some projects may be site specific so the consideration of alternative sites may not be relevant. It is generally sufficient for the developer to provide a broad description of each main alternative studied and the key environmental issues associated with each. **A ‘mini-EIA’ is not required for each alternative studied.**” (Emphasis added).*

This approach above is reflected in section 3.4.1 of the EPA EIA Guidelines 2022 which state:

“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.”⁸

Pursuant to Section 3.4.1 of the EPA EIA Guidelines 2022, the consideration of alternatives also needs to be cognisant of the fact that *“Clearly, in some instances some of the alternatives described below will not be applicable – e.g. there may be no relevant ‘alternative location’ ...”*

The EPA EIA Guidelines 2022 are also instructive in stating:

“Analysis of high-level or sectoral strategic alternatives should not be expected within a project level EIA... It should be borne in mind that the amended Directive refers to ‘reasonable alternatives... which are relevant to the proposed project and its specific characteristics.’”

The consideration of the main alternatives in respect of the development of the subject lands was undertaken by the Design Team and has occurred throughout an extensive and coordinated decision-making process, over a considerable period of time. The main alternatives considered are identified below.

2.10.1 “Do-nothing” Alternative

A “do-nothing” alternative was considered to represent an inappropriate, unsustainable and inefficient use of these Z14 zoned lands; particularly having regard to the opportunity to provide much needed housing for Dublin City Council. The suitability of the lands for development, within an established development area of the City and the application site’s location adjacent to existing amenities, schools, public transport and good road infrastructure were also key considerations.

From an environmental perspective a ‘do nothing’ approach is otherwise likely to result in a neutral impact on the environment in respect of material assets, land, water, air, climate, cultural heritage, biodiversity and landscape. Ultimately, a ‘do-nothing’ scenario was considered to represent an inappropriate, unsustainable and inefficient use of these strategically positioned, zoned, urban lands.

2.10.2 Alternative Locations

The application site is zoned for a mixed-use residential development on Z14 zoned lands, under the ownership of Dublin City Council and the proposed uses are permitted in principle with the land use zoning objectives pertaining to the project site.

The 2018 Department of Housing Planning and Local Government (DHPLG) Guidance on the preparation of EIARs notes specifically that the consideration of some types of alternatives, such as alternative locations, may not be appropriate in all cases. EIA is concerned with projects and the Environmental Protection Agency’s guidelines (2022) state that, in some instances, neither the applicant nor the competent authority can be realistically be expected to examine options that have already been previously determined by a higher authority, such as a national plan or regional programme for infrastructure which are examined by means of a Strategic Environmental Assessment (SEA), the higher tier form of environmental assessment. As the subject site has been identified to accommodate

⁸ Ref CJEU Case 461/17

the uses proposed, in the Dublin City Development Plan 2016-2022 and the Draft Dublin City Development Plan 2022-2028, it is not considered appropriate to evaluate alternative locations in the EIA.

The EIA Guidelines 2022 also note that:

“Higher level alternatives may already have been addressed during the strategic environmental assessment of relevant strategies or plans. Assessment at that level is likely to have taken account of environmental considerations associated, for example, with the cumulative impact of an area zoned for industry on a sensitive landscape.”

Section 7.6 of the SEA relating to the 2016 City Plan states that *“Based on the assessment of the alternatives, it can be concluded that Alternative 1, the Targeted Growth around existing identified growth centres scenario is the preferred scenario. This alternative seeks to target and consolidate growth around the Z5 city centre mixed use zoning area as well as existing identified growth centres such as the Strategic Development Zones and areas identified in Local Area Plans.”* The proposed redevelopment of the SDRA 9 is in accordance with the preferred SEA strategy and the consideration of alternative land uses of the current City Plan.

The Draft SEA of the 2022 Draft City Plan states that *“Following the evaluation and assessment, the preferred strategic alternative for the approach to the Draft Plan is Alternative 1: Growth focused on Identified Growth Centres. This is based on the following: consistent with the requirements of the NPF and RSES; Supports the existing urban centre; maintains and enhances all existing development, within a connected city context; prioritises growth in strategic well-serviced areas capable of delivering appropriate and sustainable development; and promotes smarter travel policies, reduction in commuting, with increased walking and cycling.”*

The issue of alternatives is a critical function of the Strategic Environmental Assessment (SEA) process and is necessary to evaluate the likely environmental consequences of a range of alternative development strategies for the city within the constraints imposed by environmental conditions. The SEA for the City Plan (existing and draft) considered alternatives at an early stage of the process and through an iterative process with the SEA and AA teams the most appropriate development scenario was selected.

The preferred strategy of the SEA provided for growth focussed on identified strategic areas. With reference to both the 2016 existing and 2022 Draft City Plans, the project site is located within a site identified as a Strategic Development and Regeneration Area (SDRA) 9.

The site provides opportunities for the coherent integration, consolidation and sustainable development of the SDRA site, as designated in the City Plan, and provides opportunities for permeability between established neighbourhoods. The site and proposed development provide significant opportunities to deliver a substantial quantum of housing in the form of the sustainable development of the SDRA and thereby contribute in a sustainable manner to meet strategic planning objectives at a local and regional level. On the basis of the foregoing, no alternative sites were considered or assessed for the purposes of preparing this EIA, nor is it considered necessary to do so.

In light of the foregoing and following consideration of environmental and planning factors at a high level, including its established zoning, it was considered that the landholding is an appropriate location for a mixed-use residential development from an environmental perspective. The proposal adopts a plan led approach to development and seeks to provide for much needed housing, including social housing, in accordance with national, regional and local policy and guidance documents

2.10.3 Alternative Uses

The project site has a Land-Use Zoning Objective Z14, the objective of which is: *“To seek the social, economic and physical development and/or rejuvenation of an area with mixed use, of which residential and ‘Z6’ [employment and enterprise] would be the predominant uses.”* (as per 2016-2022 City Plan).

The Draft City Plan 2022-2028 also has a Z14 land use zoning designation, the objective which is *“To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use”*.

The subject site is well served by existing social and community infrastructure with a wide mix and variety of uses in the surrounding area. The 2016 Plan notes that *“A number of the Z14 areas relate to important public housing regeneration areas and in the case of each, a number of development principles to guide the development of each area have been identified.”*

The 2022 Draft Plan acknowledges the importance of the SDRA lands to accommodate for additional housing. Capacity of SDRA designated lands for residential use or a mixture of residential and other uses and the Draft Plan states that the SDRA lands are critical to the Core Strategy. According to the Draft Plan, the Planning Authority focus is on the on the 17 no. Strategic Development Regeneration Areas (SDRA) which will be prioritised for development over the development plan period.

While there are other uses permitted in principle such as embassy residential, conference centre, hotel, offices, education, medical related consultants, under both existing 2016 City Plan and 2022 Draft Plan, it is considered that noting the existing uses in the area which include adjacent schools as well as a Primary Care Centre to the east in Richmond Barracks, that the proposed development provides a sustainable mix of uses, which comprise residential, retail, café, childcare as well as a Community hub/library.

It is not considered that an alternative comprising one of the alternative uses would result in the best use of these lands, particularly having regard to the generally acknowledged need for housing. The environs of the subject site include a mix of uses. In this context, the proposal now the subject of this application comprises appropriate land uses in accordance with the proper planning and sustainable development of the area and in accordance with the Z14 land use objective and in accordance with the proper planning and sustainable development of the area.

In light of these nearby uses, the sites zoning, and current demand for high quality residential units, it is put forward that other land uses on site would not be considered viable alternatives or would not be in accordance with the planning policy context pertaining to the lands.

2.10.4 Description of Alternative Processes and Technologies

The relevance of alternative processes and technologies is limited in the case of this EIAR having regard to the nature of the proposed development, which is a mixed use development. The Energy Report prepared by IN2 Consulting Engineers confirms that the proposed development will incorporate energy efficiency measures. Design and layout of schemes optimised by maximising benefits from energy efficient passive measures such as natural ventilation and lighting and reduction of cooling requirement through control of excessive solar gain is encouraged

The building fabric has been selected to meet the requirements of Part L building Regulations. The incorporation of these elements and technologies into the scheme will ensure higher performance and improved building sustainability when compared to alternative out-dated, less energy efficient materials and technologies. To achieve NZEB and Part L compliance, a suitable solution for the Emmet Rd. Development is the centralised air source heat pump system. The proposed system will consist of an arrangement of air source heat pumps, which will be located at roof level.

2.10.5 Alternative Designs and Layouts

The proposed residential development has been prepared in accordance with the requirements of the National Planning Framework, the Regional Spatial and Economic Strategy for the Mid-East area as well as the relevant Section 28 Guidelines including those relating to Urban Development and Building Height Guidelines (2018), Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities December 2020 and the Sustainable Residential Development in Urban Areas (2009) as well as, where relevant, the Dublin City Development Plan 2016-2022, and the Draft Dublin City Development Plan 2022-2028.

The mitigation measures detailed within the EIAR do not require changes to the design and layout of the proposed residential scheme. The EIAR provides reasonable evidence that the proposed development can be accommodated on the subject site without predicted risk of significant adverse impact on the environment, subject to the identified mitigation measures at construction and operational stages being implemented.

The design approach for the proposed development is presented in the Architectural Design Statement prepared by the project architects, BMCEA Architects and it should be considered in conjunction with this chapter of the EIAR. During the design process for the proposed Project a range of iterations of the proposed Site layout were considered. The planning application and this EIAR demonstrates that the Site and the surrounding area have the environmental capacity to accommodate the proposed Project without significant risk of impact upon environmental sensitivities.

The key considerations which influenced the design of the proposed Project were as follows:

- Environmental Impacts/effects of the alternatives relating to the project;
- To provide and promote a mixed-use development in the Inchicore areas of the City, with regard to the need for high standards of urban design/architecture and to successfully integrate the development with the character of the surrounding area, including protected structures;
- The need to promote sustainable development of vacant or under-utilised sites and to consider higher density proposals;
- The need to provide sustainable neighbourhoods by achieving suitable levels of amenity;
- The need to provide suitable social infrastructure and other support facilities are available in the neighbourhood;
- The need to include community hubs, sports and recreational green open spaces and suitable shops contributing to the creation of sustainable and mixed-income neighbourhoods;
- The quality of the urban environment to be delivered and the associated impact on human health;

Each of the design alternatives have been subject to significant planning and design input, are capable of implementation, and therefore represent plausible design alternatives for the development of the proposed development site. The key environmental issues associated with each alternative scenario has been considered by the applicant in advance of selecting the proposed preferred alternative. It is noted other feasibility studies were undertaken by DCC such as the Housing Land Initiative Report - December 2015 feasibility study which proposed c. 300 units on the site. It is considered the broad environmental effects are reflected in Alternative no 1.

In this respect, the design team considered a number of options in terms of overall layout as follows:

2.10.5.1 Alternative no. 1 – Feasibility Study (2017)

Alternative no. 1 relates to a feasibility study undertaken in 2017 which related to a 4 phase development of c. 420 no. dwellings in a range of heights of 3 to 5 storeys. The overall study included the adjacent lands to the east (Phase 1B and Thornton Heights). Phase 2 and 3 related to the project site.

Figure 2.22 – Alternative no. 1



2.10.5.2 Alternative no. 1 - Comparison of Environmental Effects

Population and Human Health

420 new homes would be realised under Alternative no. 1, and this would be a significant positive effect at a local context and the effect would be permanent.

Biodiversity

With reference to Biodiversity the implementation of Alternative no. 1 would be positive as it includes a comprehensive planting programme.

Land and Soils

Development of the land would require site clearance and minor excavations to facilitate foundations and services. The effect would be slight negative due to the loss of underlying soils. However, this is consistent with achieving compact growth. The effect is locally negative, with a significance rating of imperceptible to not significant and of permanent duration.

Water/Hydrology

The application area is not within a sensitive hydrological environment and there is no surface water body within the site. The implementation of Alternative no. 1 would require sustainable urban drainage (SuDS) measures in line with the requirements of the Greater Dublin Strategic Drainage Study (GSDSDS). This would have a significant positive effect on the City's hydrological environment with a permanent duration.

Air Quality and Climate

Having regard to the site’s location, any development on this site would promote a modal shift and this will have moderate-significant positive effects on air quality locally.

Noise and Vibration

The introduction of development will increase the noise generated at the site, the effect is considered to be neutral and imperceptible locally with a permanent duration.

Landscape and Visual

The surrounding site is a mixture of commercial residential and includes Richmond Barracks and St. Michael’s Church (protected structures). Alternative no. 1 proposed heights that ranged from 3-5 storeys. Increased height will change the landscape and townscape character. The redevelopment of the site would be positive and long term.

Material Assets

Any increase in development would place additional demand on existing infrastructure including drainage and water supply. Irish Water have confirmed the feasibility of the proposed development and the effect is neutral, imperceptible and permanent.

Cultural Heritage

While not expressly stated, for the purposes of comparison, it is assumed that alternative no. 1 included interventions to the protected wall along the north western boundary. Loss of fabric has to be balanced with overall amenity of the wall presentation – ability of the existing masonry, when modified, to contribute at ground and at roof level to overall positive visual and social amenity of the scheme. In the event that the wall was to be removed in its entirety the effect would be permanent, negative, profound.

Removal of connections to defensive barracks wall allows for more generous connections and visual spatial improvements at junctions. Existing historic building will remain a backdrop to new building to the west. Large green space to west of historic buildings will provide breathing space across Patriot’s Path. The impact of the modifications to the boundary wall is considered to be permanent, negative and significant.

2.10.5.3 Alternative no. 2 – Development Framework Plan 2019

In 2019 Dublin City Council, in conjunction with consultants, prepared a Development Framework (non-statutory) Plan (DFP) for the redevelopment of lands at Emmet Road. The DFP set out the future vision for the lands at Emmet Road. The DFP provided a ‘proof of concept’ proposal which includes permeability, a series of open spaces as well as residential, commercial, civic (library) retail, as well as 484 no. apartments in a predominantly 6 storey development with some 7 storey elements.

Alternative no. 2 also included a library, community centre, supermarket, retail, café and childcare.

Figure 2.23 – Alternative no. 2



Development Framework Plan 2019

2.10.5.4 Alternative no. 2 – Comparison of Environmental Effects

Population and Human Health

484 new homes together with retail, library, and related activities and employment opportunities would be realised under Alternative no. 2 and this would be a significant positive effect at a local context and the effect would be permanent.

Biodiversity

With reference to Biodiversity the implementation of Alternative no. 2 would be positive as it includes a comprehensive planting programme as set out in the DFP.

Land and Soils

Development of the land would require site clearance and minor excavations to facilitate foundations and services. The effect would be slight negative due to the loss of underlying soils. However, this is consistent with achieving compact growth. The effect is locally negative, with a significance rating of imperceptible to not significant and of permanent duration.

Water/Hydrology

The application area is not within a sensitive hydrological environment and there is no surface water body within the site. The implementation of Alternative no. 2 would require sustainable urban drainage (SuDS) measures in line with the requirements of the Greater Dublin Strategic Drainage Study (GSDSDS). This would have a significant positive effect on the City's hydrological environment with a permanent duration.

Air Quality and Climate

Having regard to the site's location in proximity to public transport options (Luas and bus) any development on this site would promote a modal shift from the motor car to sustainable forms of transport and this will have moderate positive effects on air quality locally.

Noise and Vibration

The introduction of development will increase the noise generated at the site, the effect is considered to be neutral and imperceptible locally with a permanent duration.

Landscape and Visual

The surrounding site is a mixture of commercial residential and includes Richmond Barracks and St. Michael's Church (protected structures). Alternative no. 2 proposed heights that ranged from 6-7 storeys. Increased height will change the landscape and townscape character. The redevelopment of the site would be positive and long term.

Material Assets

Any increase in development would place additional demand on existing infrastructure including drainage and water supply. Irish Water have confirmed the feasibility of the proposed development and the effect is neutral, imperceptible and permanent.

Cultural Heritage

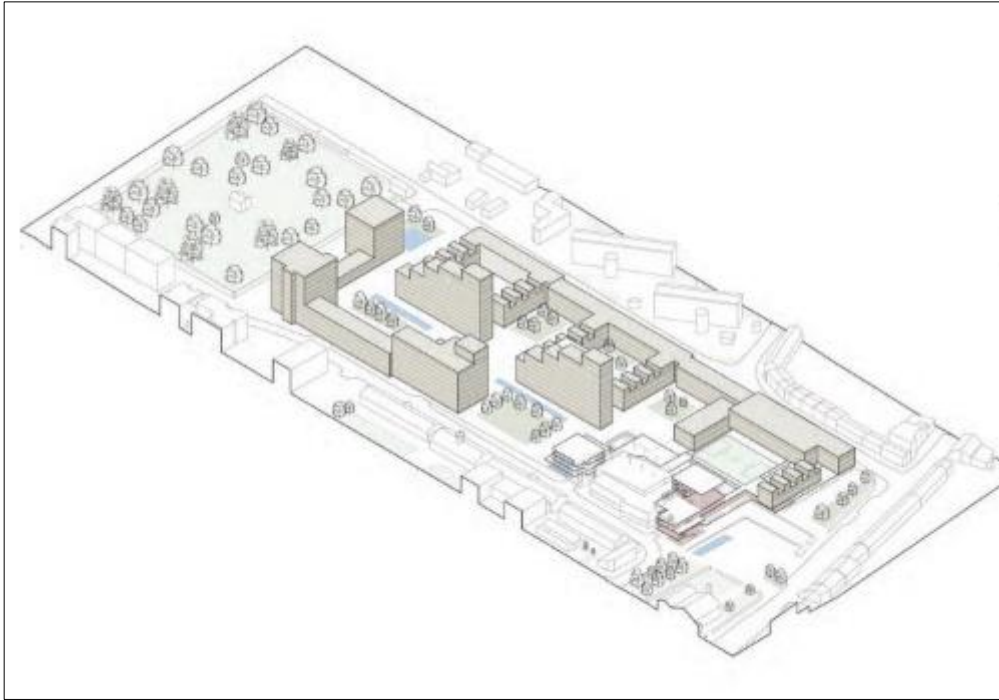
Alternative no. 2 included interventions to the protected wall along the north western boundary. Loss of fabric has to be balanced with overall amenity of the wall presentation – ability of the existing masonry, when modified, to contribute at ground and at roof level to overall positive visual and social amenity of the scheme.

Removal of connections to defensive barracks wall allows for more generous connections and visual spatial improvements at junctions. Existing historic building will remain a backdrop to new building to the west. Large green space to west of historic buildings will provide breathing space across Patriot's Path. The impact of the modifications to the boundary wall is considered to be permanent, negative and significant.

2.10.5.5 Alternative no. 3–.(Q4 2020)

Alternative no. 3 relates to Q4 and comprised a scheme of 498 no. units in heights ranging from 4 / 8 / 11 stories.

Figure 2.24 – Alternative no. 3



2.10.5.6 Alternative no. 3 – Comparison of Environmental Effects

Population and Human Health

498 new homes together with retail, library, and related activities and employment opportunities would be realised under Alternative no. 3 and this would be a significant positive effect at a local context and the effect would be permanent.

Biodiversity

With reference to Biodiversity the implementation of Alternative no. 3 would be positive as it includes a comprehensive planting programme.

Land and Soils

Development of the land would require site clearance and minor excavations to facilitate foundations and services. The effect would be slight negative due to the loss of underlying soils. However, this is consistent with achieving compact growth. The effect is locally negative, with a significance rating of imperceptible to not significant and of permanent duration.

Water/Hydrology

The application area is not within a sensitive hydrological environment and there is no surface water body within the site. The implementation of Alternative no. 3 would require sustainable urban drainage (SuDS) measures in line with the requirements of the Greater Dublin Strategic Drainage Study (GSDSDS). This would have a significant positive effect on the City's hydrological environment with a permanent duration.

Air Quality and Climate

Having regard to the site's location, any development on this site would promote a modal shift and this will have moderate-significant positive effects on air quality locally.

Noise and Vibration

The introduction of development will increase the noise generated at the site, the effect is considered to be neutral and imperceptible locally with a permanent duration.

Landscape and Visual

The surrounding site is a mixture of commercial residential and includes Richmond Barracks and St. Michael's Church (protected structures). Alternative no. 3 proposed heights that ranged from 4-11 storeys. Increased height will alter the landscape and townscape character. 11-storeys was proposed and the effect is determined to be locally neutral, not significant with a permanent duration.

Material Assets

Any increase in development would place additional demand on existing infrastructure including drainage and water supply. Irish Water have confirmed the feasibility of the proposed development and the effect is neutral, imperceptible and permanent.

Cultural Heritage

Alternative no. 3 included interventions to the protected wall along the north western boundary. Loss of fabric has to be balanced with overall amenity of the wall presentation – ability of the existing masonry, when modified, to contribute at ground and at roof level to overall positive visual and social amenity of the scheme.

Removal of connections to defensive barracks wall allows for more generous connections and visual spatial improvements at junctions. Existing historic building will remain a backdrop to new building to the west. Large green space to west of historic buildings will provide breathing space across Patriot's Path. The impact of the modifications to the boundary wall is considered to be permanent, negative and significant.

2.10.5.7 Alternative no. 4 – Proposed Development

The proposed development comprises 578 no. apartments supplemented and supported by community facilities (Library/Community Hub, Creche, Retail/Café units), a plaza in a mixed-use scheme which includes a supermarket fronting onto Emmet Road.

Figure 2.25 – Alternative no. 4 Proposed Development



2.10.5.8 Alternative no. 4 – Comparison of Environmental Effects

Population and Human Health

578 new homes together with retail, including local neighbourhood supermarket, community hub/library, creche and related activities and employment opportunities would be realised under Alternative no. 4 and this would be a significant positive effect at a local context and the effect would be permanent.

Biodiversity

With reference to Biodiversity the implementation of Alternative no. 4 would be positive as it includes a comprehensive planting programme. While there is an increase in overall numbers compared to other alternatives, the increase is considered to be neutral and long term.

Land and Soils

Development of the land would require site clearance and minor excavations to facilitate foundations and services. The effect would be slight negative due to the loss of underlying soils. However, this is consistent with achieving compact growth. The effect is locally negative, with a significance rating of imperceptible to not significant and of permanent duration. While there is an increase in overall numbers compared to other alternatives, the increase is considered to be neutral and long term.

Water/Hydrology

The application area is not within a sensitive hydrological environment and there is no surface water body within the site. The implementation of Alternative no. 4 would require sustainable urban drainage (SuDS) measures in line with the requirements of the Greater Dublin Strategic Drainage Study (GSDS). This would have a significant positive effect on the City's hydrological environment with a permanent duration.

While there is an increase in overall numbers compared to other alternatives, the increase is considered to be imperceptible, negative in the operational phase.

Air Quality and Climate

Having regard to the site's location in proximity to public transport options (Luas and bus) any development on this site would promote a modal shift from the motor car to sustainable forms of transport and this will have moderate positive effects on air quality locally.

Noise and Vibration

The introduction of development will increase the noise generated at the site, the effect is considered to be neutral and imperceptible locally with a permanent duration.

Landscape and Visual

The surrounding site is a mixture of commercial residential and includes Richmond Barracks and St. Michael's Church (protected structures). Alternative no. 4 proposed heights that ranged from 4-7 storeys. Increased height will change the landscape and townscape character. The range of heights is considered to be relatively modest and the effect is determined to be locally slight negative, not significant with a permanent duration.

Material Assets

Any increase in development would place additional demand on existing infrastructure including drainage and water supply. Irish Water have confirmed the feasibility of the proposed development and the effect is neutral, imperceptible and permanent.

Cultural Heritage

Alternative no. 4 includes interventions to the protected wall along the north western boundary. Loss of fabric has to be balanced with overall amenity of the wall presentation – ability of the existing masonry, when modified, to contribute at ground and at roof level to overall positive visual and social amenity of the scheme.

Removal of connections to defensive barracks wall allows for more generous connections and visual spatial improvements at junctions. Existing historic building will remain a backdrop to new building to the west. Large green space to west of historic buildings will provide breathing space across Patriot's Path. The impact of the modifications to the boundary wall is considered to be permanent, negative and significant.

2.10.6 Proposed Preferred Alternative - Main reasons for the option chosen, including a comparison of the environmental effects

With reference to the final layout, the iterative process outlined above, which included alternative site layouts were considered with the objective of producing a new high quality residential development, which has undergone a robust consideration of relevant alternatives having regard to the comparison of environmental effects and meets the requirements of the EIA Directive, based on the multidisciplinary review across all environmental topics.

The multidisciplinary EIAR team reviewed the Development Framework layout against all environmental topics and proposed alternatives to achieve environmental improvements while remaining compliant with the Development Plan objectives to achieve regeneration of the site. This approach is consistent with the requirements of the EIA Directive.

The preferred alternative provides an appropriate intensification of development on the strategically located site, close to public transport options.

The proposed development provides for new mixed use residential development on lands within an SDRA, which was subject to the SEA process. As such, consideration of alternative sites for the construction of apartments proposed in this residential development was not considered necessary.

The height strategy under all 3 scenarios is to increase height above the existing surrounding context. This will change the local landscape and visual character and is consistent with the principles of compact growth. Increased height is appropriate, considering the location of the site within the canal cordon.

The comparison of main environmental effects are similar for the alternatives as they relate to the redevelopment of the Project Site with a mixed use residential development.

Table 2.8 – Summary Table of Comparison of Main Environmental Effects

Criteria	Alternative 1 2017	Alternative 2 DFP 2019	Alternative 3 Stage 1 Report	Alternative 4 Proposed Development
Population and Human Health	Significant Positive Permanent	Significant Positive Permanent	Significant Positive Permanent	Significant Positive Permanent
Biodiversity	Positive	Positive	Positive	Positive
Land and Soils	locally negative, imperceptible permanent	locally negative, imperceptible permanent	locally negative, imperceptible permanent	locally negative, imperceptible permanent
Water	Positive Permanent	Positive Permanent	Positive Permanent	Positive Permanent
Air and Noise (Vibration)	Neutral Imperceptible	Neutral Imperceptible	Neutral Imperceptible	Neutral Imperceptible
Air Quality and Climate	Neutral	Neutral	Neutral	Neutral
Landscape and Visual	Positive. long term to permanent	Positive. long term to permanent	Neutral, not significant with a permanent duration	Significant positive. long term to permanent
Material Assets Transportation	Neutral	Slight, Positive	Slight, Positive	Slight, Positive
Material Assets Utilities	neutral, imperceptible and permanent	neutral, imperceptible and permanent	neutral, imperceptible and permanent	neutral, imperceptible and permanent
Material Assets Waste Management	Neutral	Neutral	Positive	Positive

Criteria	Alternative 1 2017	Alternative 2 DFP 2019	Alternative 3 Stage 1 Report	Alternative 4 Proposed Development
Risk Management	Neutral	Neutral	Neutral	Neutral
Cultural Heritage Architectural Heritage (to protected wall)	permanent, negative and significant	permanent, negative and significant	permanent, negative and significant	permanent, negative and significant

The proposal submitted to the Board (alternative no. 4) is considered to be the optimal design solution for the subject site, having regard to the site's constraints and to the objective of making efficient use of the serviced residential lands. With reference to Population and Human health the potential impacts are broadly similar – the development of the lands will increase the population of the SDRA in line with local and strategic policy for the area, which is positive.

For Biodiversity, the subject lands are not particularly sensitive from an ecological perspective and will be redeveloped in all 4 no. alternatives.

For Landscape and Visual, the reduced height in Alternative nos. 3 and 4 reduced the perceived impacts compared to alternative no. 3 which comprised heights of up to 11 storeys.

Air and noise impacts from the alternatives are broadly similar. Principally these impacts will occur as a result of the construction phase of the development as operational impacts would be largely restricted to traffic and these volumes are generally low, having regard to the parking strategy. As these impacts can be largely mitigated through good construction practices, the residual impact is considered low and temporary in all cases. For Risk Management the comparison is neutral across the alternatives due to the similar nature of the proposals (mixed use residential).

With regard to Material Assets (Utilities), it is considered the alternatives are similar as they would require servicing and also ESB etc. While the additional quantum of houses will result in increased demand for foul and water supply, these can be accommodated, which is confirmed by Irish Water. For Material Assets (Waste Management), the preferred alternative was positive because the design was refined to include appropriate waste management.

The Project Site is considered appropriate for a mixed use residential development for the following reasons:

- The redevelopment of the site offers the opportunity to underpin the principles of compact growth.
- The site's location within walking distance of public transport options (Luas and bus), in conjunction with the reduced parking strategy would promote a modal shift from the private car to more sustainable forms of transport.
- This in turn would assist with achieving overarching environmental objectives such as improved air quality and a reduction in noise pollution.
- The site is not subject to any statutory nature conservation designation.
- The site is not located within an area identified as susceptible to flooding.

In summary, the overall design of the proposed development takes into account all environmental effects and provides for a sustainable development that has been optimised to emphasise positive environmental effects whilst reducing negative environmental impacts wherever possible. The comparison in the increase in density and number of units on the subject site between the alternatives is not considered to be material, across the environmental impacts/effects. The preferred alternative is not considered to give rise to any significant adverse environmental impacts following the mitigation measures to be implemented at the construction and operational phases. The final proposed scheme also responds to the characteristics and constraints of the subject site vis a vis the previous iterations of the scheme and the alternative layouts considered.

Having regard to the above, it is considered that the application area is an appropriate site from an environmental perspective for the proposed development of a mixed-use scheme.

3.0 POPULATION AND HUMAN HEALTH

3.1 INTRODUCTION

The 2014 EIA Directive (2014/52/EU), as transposed into Irish legislation, amended the topics to be addressed in an EIAR and has replaced 'Human Beings' with 'Population and Human Health'.

In preparing this chapter, consideration has been given to the other inputs to this EIAR including, in particular, the chapters addressing Air Quality and Climate, Noise and Vibration, Traffic as well as Risk Assessment Chapter (accidents or disasters) and the separate reports addressing Construction and Demolition Waste Management, and the Construction Environmental Management Plan.

Population and Human Health comprise an important aspect of the environmental impact assessment to be undertaken by the competent authority. Any significant impact on the status of human health, which may be potentially caused by a development proposal, must therefore be comprehensively addressed.

Population and Human Health is a broad ranging topic and addresses the existence, activities and wellbeing of people as groups or 'populations'. While most developments by people will affect other people, this EIAR concentrates on those topics which are manifested in the environment, such as the construction of the development, new land uses, more buildings or greater emissions.

3.2 STUDY METHODOLOGY

At the time of writing there is no specific guidance from the EU Commission on the 2014 EIA Directive to indicate how the term 'Human Health' should be addressed. However, the European Commission's *Guidance on the preparation of the Environmental Impact Assessment Report (2017)* does reference the requirement to describe and, where appropriate, quantify the primary and secondary effects on human health and welfare. Moreover, the European Commission guidance states the following in relation to the assessment of Human Health:

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

EU Commission's SEA Implementation Guidance from 2003, as it gives an indication of how 'human health' should be considered in terms of environmental assessment and notes:

"The notion of human health should be considered in the context of the other issues mentioned [in the list of factors to be identified, described and assessed] and thus environmentally related health issues such as exposure to traffic noise or air pollutants are obvious aspects to study." (para 5.26).

In accordance with this approach to Human Health espoused in the Commission Guidance, this chapter addresses human health in the context of other factors addressed elsewhere in further detail within the EIAR where relevant. Relevant factors identified include inter alia water, air quality, noise, and the risk of major accidents and disasters.

In addition, this chapter of the EIAR has been prepared with reference to recent national publications which provide guidance on the 2014 EIA Directive including the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018) and the Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA in May 2022.

The insight provided by the Institute of Environmental Management and Assessment (IEMA) Health in Environmental Impact Assessment: A Primer for a Proportionate Approach document (2017) has also been considered in the preparation of this chapter. The IEMA document posits that human health spans environmental, social and economic aspects and does not merely represent an absence of disease. A broad conception of human health is put forward, that should encompass factors such as local economy and community, rather than relying on a narrower focus on biophysical health factors and determinants. In this regard, the current chapter seeks to address population and human health in a holistic manner, including consideration of economic factors, settlement patterns, landscape and visual impact, and land-use.

The 2018 EIA Guidelines published by the Department of Housing, Planning and Local Government (DHPLG) state that there is a close interrelationship between the SEA Directive and the 2014 EIA Directive. The Guidelines state that the term ‘*Human Health*’ is contained within both of these directives, and that a common interpretation of this term should therefore be applied.

To establish the existing receiving environment / baseline, site visits were undertaken to appraise the location and likely and significant potential impact upon human receptors of this proposed development. A desk-based study of published reference documents such as Central Statistics Office Census data, the ESRI Quarterly Economic Commentary, the *Regional Spatial and Economic Strategy for the Eastern and Midlands Regional Assembly, 2019*, *Dublin City Development Plan 2016 and Draft Dublin City Development Plan* has also been undertaken. The Strategic Environmental Assessments (SEA) for the City Plan has also been reviewed, as both provide a consideration of Population and Human Health.

It should be noted that there are numerous inter-related environmental topics described throughout this EIAR document which are also of relevance to Population and Human Health. Issues such as the potential likely and significant impacts of the proposed development on townscape and visual impact, archaeology and cultural heritage, air quality and climate, noise and vibration, water, land and soils, material assets including traffic and transport impacts, are of intrinsic direct and indirect consequences to human health. For detailed reference to particular environmental topics please refer to the corresponding chapter of the EIAR.

The 2022 EPA Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA states that ‘In an EIAR, the assessment of impacts on population & human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g. under the environmental factors of air, water, soil etc..’

This chapter of the EIAR document focuses primarily on the direct and indirect significant effects on Population, which includes Human Beings, and Human Health in relation to health effects/issues and environmental hazards arising from the other environmental factors. Where there are identified associated and inter-related potential likely and significant impacts which are more comprehensively addressed elsewhere in this EIAR document, these are referred to. The reader is directed to the relevant environmental chapter of this EIAR document for a more detailed assessment.

This chapter has been prepared having regard to the following guidelines;

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018)
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – (EPA, 2022);

The impact assessment section of this chapter follows the terminology (where applicable) used in the EPA Guidelines as set out in Chapter 1 of this EIAR.

3.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

3.3.1 Introduction

A description of the relevant aspects of the current state of the environment (baseline scenario) in relation to population and human health is provided below. Specific environmental chapters in this EIAR provide a baseline scenario relevant to the environmental topic being discussed. Therefore, the baseline scenario for separate environmental topics is not duplicated in this section; however, in line with guidance provided by the European Commission, the EPA and the DHPLG, the assessment of impacts on population and human health refers to those environmental topics under which human health effects might occur, e.g., noise, water, air quality etc. An outline of the likely evolution without implementation of the project as regards natural changes from the baseline scenario is also provided. This is the “Do Nothing” scenario.

The existing environment is considered in this section under the following headings:

- Economic Activity;
- Social Patterns;
- Land Use and Settlement Patterns;
- Employment;
- Health & Safety;

The subject site is located at the centre of the built-up area of Inchicore, located c. 4km to the west of Dublin City Centre and situated within the boundaries of Dublin City Council. The subject site comprises of 4.68 hectares which includes works on the public road comprising watermain upgrade along Emmet Road to the junction of Tyrconnell Road/Grattan Crescent as well as tie in works surrounding the site. The main development site extends to c. 3.72 ha and includes 2 no. buildings which have planning permission (Part 8 Planning Reg. Ref. 2221/21) for demolition (comprising former health centre and St. Michael’s community centre in the northern portions of the site), with the remainder comprising the lands previously associated with St. Michael’s Estate. These works have been taken into account in respect of potential impacts/effects in the preparation of the EIAR.

Figure 3.1 – Adjacent Uses



Note: Site Outline excludes works on public road

Adjacent to the site is Inchicore Community Sports Centre, which is outside the proposed works but will be integrated into the development.

The site is bound to the north by Emmet Road and the historic Goldenbridge Cemetery to the south, with the Grand Canal located beyond. To the east, the site shares a contiguous boundary with Patriot's Path which is fronted by Inchicore Primary Care Centre, Richmond Barracks and residential dwellings forming part of Bulfin Court and the Thornton Heights development. St. Vincent's Street West borders the site to the west which is occupied by a number of residential and commercial properties and Our Lady of Lourdes Catholic Primary School.

The site can be accessed from the north, east and west with entrances from Emmet Road into the existing St John Bosco community centre complex, from St Michael's Estate Road into the current Inchicore Community Sports Centre and from both St Michael's Estate Road and St Vincent Street West to the southern portions of the site, providing adequate access to and from all areas of the site. These roads connect the site with the broader context of the area with Emmet Road primarily providing links to Tyrconnell Road as the main distributor road in Inchicore to areas further afield including Ballyfermot, Chapelizod and Liffey Valley via the R148 / N4 and Drimnagh, Clondalkin and Tallaght via the Naas Road and M7 motorway, providing additional linkages to Limerick, Cork and Waterford. The inner city of Dublin is also easily accessible via Emmet Road and the R148, including via the quality public transport provision and infrastructure in the area.

The site is served by a bus stop to its immediate northern boundary along Emmet Road which is served by the 13 (every 15-20 mins), 40 (every 15-20 mins) and 68 (every hour) Dublin bus routes, which provide connections to Ballymun-Grange Castle via City Centre, Ballymun-Liffey Valley via City Centre and City Centre-Newcastle respectively. The site is also served by the LUAS Red Line c. 200m south of the site along the Grand Canal, providing additional linkages to the Dublin Docklands, Tallaght, Saggart and further afield via Intercity LUAS connections in Dublin city centre.

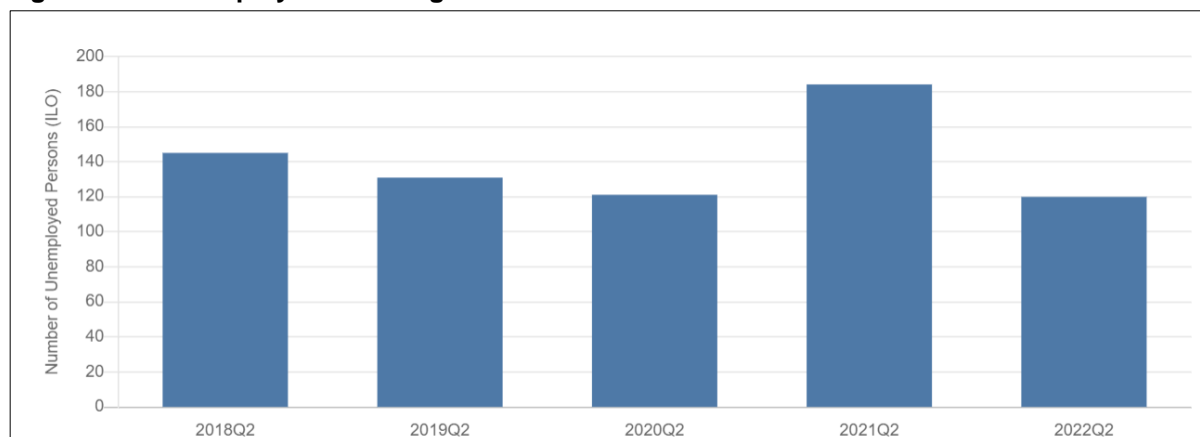
The site is also c. 200-300m walk from Inchicore village which supports a range of commercial and social facilities including a church; a national school; a range of local village shops; a pharmacy; a bank and bars/restaurants. The Grattan Crescent Park and Richmond Park Stadium are located just beyond the site to the north also, providing necessary green amenities areas for potential future residents on site. Further detail is provided in the Social Infrastructure Assessment prepared by John Spain Associated, included with the Part 10 application.

3.3.2 Economic & Employment Activity

The wider context of employment activity is a key driver of demand for new housing. The CSO's Quarterly Labour Force Survey for Q2 2022 (published August 25th, 2022), indicated that the number of persons in the labour force was up 12.1% (+274,000) from 2,349,100 over the year, while the employment rate was up from 68.6% in Q1 2021 to 73.5% in Q2 2022.

The COVID-19 Adjusted Measure of Employment, or the lower bound for the number of employed persons aged 15 years and over, increased from 2,249,200 to 2,554,600 between the end of Q2 2021 and Q2 2022. The number of people employed but absent from work dropped from 220,900 in Q2 2021 to 187,200 in Q2 2022.

Figure 3.2 – Unemployment during Q2 2018-2022



(Source: CSO)

The CSO Monthly release (4th August 2022) note that the application of the standard methodology gives a seasonally adjusted Monthly Unemployment Rate of 4.2% for July 2022, down from the rate of 4.3% in June 2022 and up from

4.2% in April 2021. The seasonally adjusted number of persons unemployed was 113,000 in July 2022, compared to 113,900 in June 2022. When compared to April 2021, there was an annual decrease of 36,000 in the seasonally adjusted number of persons unemployed.

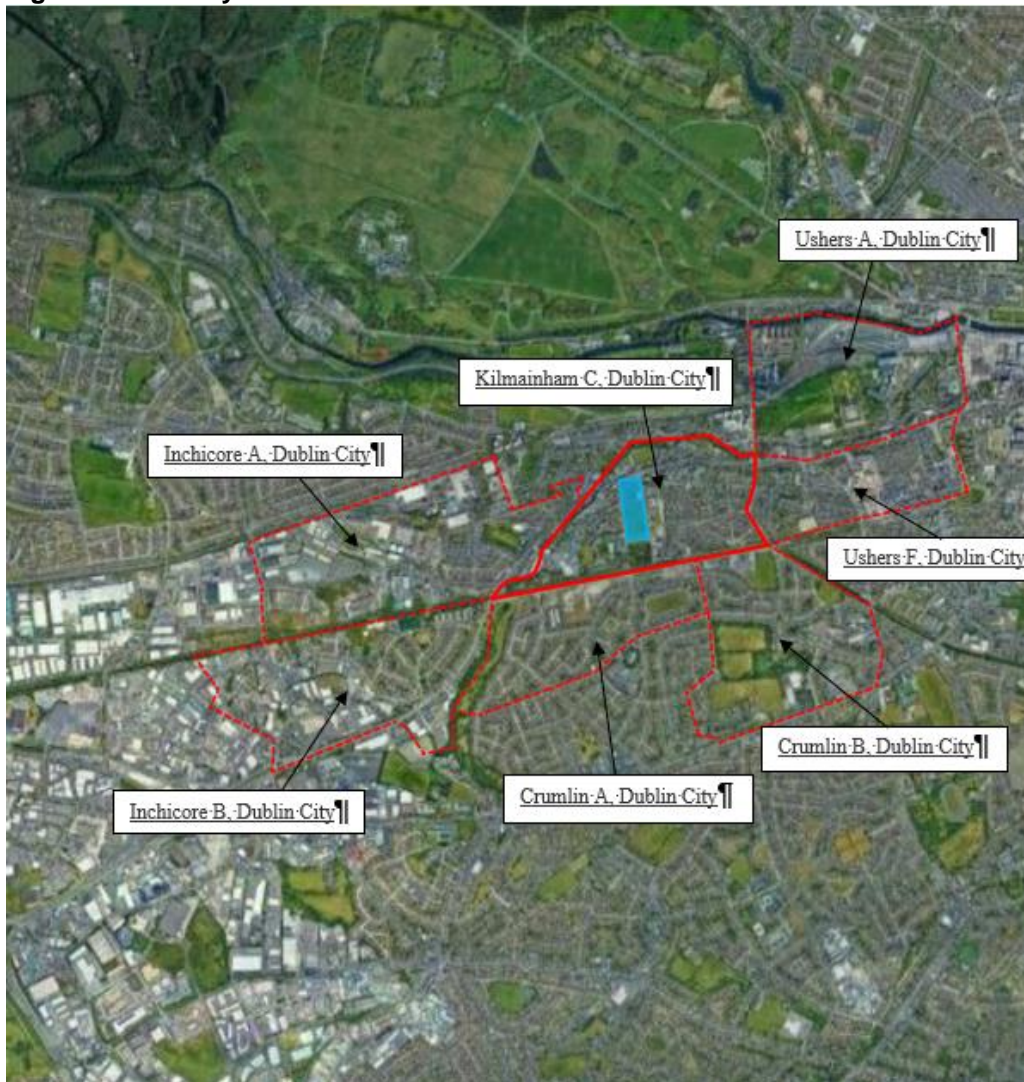
The Economic Social Research Institute (ESRI) quarterly economic commentary for Summer 2022⁹ notes that “Notwithstanding the significant headwinds confronting the global and Irish economies, GDP is set to increase by 6.8 per cent this year and 4.8 per cent in 2023. In the present year, Modified Domestic Demand (MDD) is set to increase by 4.4 per cent in 2022, and 3.7 per cent in 2023. This is somewhat lower than our previous MDD forecasts in the Spring Commentary of 5 and 4.5 per cent for 2022 and 2023, respectively”.

The ESRI notes that Unemployment is now set to fall to 5% by the end of 2022, down from the average 16.1% in 2021.

3.3.3 Social Patterns

For the purposes of this chapter, a review has been carried out of data from the 2006, 2011 and the 2016 Census of Population in order to identify any significant changes in population levels and age profile at national, regional, county, city and local levels. The 2016 Census results provide for an overview of the current population, employment and economic statistics and trends of the State.

Figure 3.3 – Study Area in Electoral Divisions



⁹ Published June 16th, 2022.

Development Site outlined in Blue (Source: CSO, 2016).

The subject site is located within the boundaries of the Electoral division (ED) of Kilmainham C as defined by the Central Statics Office. This ED comprises the immediate catchment area of the subject site.

The ED's comprising the wider study area includes the Inchicore A, Inchicore B, Ushers A, Ushers F, Crumlin A and Crumlin B electoral divisions (and Kilmainham C). Figure 3.3 indicates the geographical extent of the immediate catchment and the wider study area.

A review was also carried out of the census data relating to social class and household size at each of these levels. The following section provides a summary description of the existing environment in terms of each of these indicators.

3.3.3.1 Population

The preliminary results of the 2022 Census were published on the 23rd of June 2022. The main Census results will be published over several months starting in April 2023.

The preliminary population figures for the State were 5,123,536 persons in 2022. This is the first time that a census has recorded a population of over five million people in over 170 years. The population increased by 361,671 persons, or 8% since April 2016. The population of Dublin County increased by 7.7% between 2016 and 2022 to now comprise 1,450,701 persons or an increase of some 105,299. The population of the Greater Dublin Area is now 2,073,459 persons, an increase of 8.8% compared to 2016.

It can be seen that the overall percentage change within the Study area increased by 3.9% between 2016 and 2022, which is below the percentage change for the State of 8% over the same period. Within the study area the majority of the increase was within the ED of Ushers A, which recorded an increase of 29.5% or 1,160 persons between 2016 and 2022. For the ED of Kilmainham C (within which the Emmet Road site is located), the population fell by 4.7% or 245 no. persons between 2016 and 2022.

Table 3.1 – Study Area ED Population 2016 & 2022

Electoral District	Population (Males)	Population (Females)	Total 2016	Total 2022	Change	% Change
Crumlin A	1,795	1,919	3,714	3,634	-80	-2.2%
Crumlin B	1,450	1,518	2,968	2,990	22	0.7%
Inchicore A	1,201	1,191	2,392	2,460	68	2.8%
Inchicore B	1,091	1,127	2,218	2,274	56	2.5%
Kilmainham C	2,550	2,636	5,186	4,941	-245	-4.7%
Ushers A	2,029	1,901	3,930	5,090	1,160	29.5%
Ushers F	1,701	1,783	3,484	3,438	-46	-1.3%
Study Area	11,817	12,075	23,892	24,827	935	3.9%

Source: Census 2016 & Preliminary Census Results 2022

The table below shows the population of the State, the Greater Dublin Area, Dublin County and City, the wider study area, and the Kilmainham C electoral division area for 2006, 2011 and 2016. (It should be noted that that the Greater Dublin Area (GDA) includes Dublin County as well as Wicklow, Kildare, and Meath. Dublin County includes Fingal, South Dublin, Dún-Laoghaire Rathdown and Dublin City).

Table 3.2 – Population at State, Regional, County and Local Level, 2006- 2016

Area	2006	2011	2016	Change 06 - 16	% Change
State	4,239,848	4,588,252	4,757,976	518,128	12.2%
Greater Dublin Area	1,662,536	1,804,156	1,904,806	242,270	14.5%
Dublin County	1,187,176	1,273,069	1,345,402	158,226	13.3%
Dublin City	506,211	527,612	553,165	46,954	9.2%
Study Area	10,244	21,586	23,892	13,648	133.2%
Kilmainham C ED	2,416	4,358	5,186	1,626	67.3%

Source: Census of Population 2006, 2011 and 2016

3.4 AGE PROFILE

Table 3.3 shows the population of the State, the Greater Dublin Area, Dublin County and City, the wider study area, and the Kilmainham C ED level for 2006, 2011 and 2016. The figures are not yet available for Census 2022.

Table 3.3 – Age Profile at State, County and Local Level, 2006-2011-2016

Area	0-14	15-24	25-44	45-64	65+
State 2006	20.4%	14.9%	31.7%	21.9%	11.0%
State 2011	21.3%	12.6%	31.6%	22.7%	11.7%
State 2016	21.1%	12.1%	29.5%	23.8%	13.4%
GDA 2006	19.6%	15.6%	34.4%	20.7%	9.7%
GDA 2011	20.8%	13.1%	34.2%	21.5%	10.4%
GDA 2016	20.7%	12.4%	32.5%	22.5%	11.9%
Dublin County 2006	18.3%	16.2%	34.5%	20.6%	10.3%
Dublin County 2011	19.3%	13.6%	34.9%	21.3%	10.9%
Dublin County 2016	19.3%	12.7%	33.8%	22.0%	12.2%
Dublin City 2006	15.0%	16.9%	35.7%	19.7%	12.7%
Dublin City 2011	15.2%	14.5%	37.2%	20.5%	12.6%
Dublin City 2016	15.0%	13.2%	37.4%	21.3%	13.0%
Study Area 2006	14.6%	13.6%	36.9%	19.7%	15.3%
Study Area 2011	15%	12.3%	38.1%	20.3%	14.1%
Study Area 2016	14.6%	11.3%	40.2%	20.3%	13.5%
Kilmainham C ED 2006	15.8%	13.9%	42.6%	16.1%	11.5%
Kilmainham C ED 2011	16.1%	12.9%	41.7%	18.2%	11.1%
Kilmainham C ED 2016	17%	12.5%	41.9%	18.2%	10.5%

Source: Census of Population 2006, 2011 and 2016

The table indicates that the highest percentage of population in the study area relates to the working age group (25-44). It is considered that the available working population in the immediate vicinity of the proposed development will enhance the attractiveness of investors to locate in this area to benefit from the significant available work force. In addition, the following statistics further indicate the appropriateness of the proposed office development in relation to the highly skilled and educated work force in the surrounding area.

3.5 SOCIAL CLASS

The Census of Population determines social class by the nature of employment and is therefore useful as a guide to the principal types of occupation in which the population is employed or in which the population is capable of being employed. Table 3.4 shows the number and percentage of people in each of the 11 socio-economic groups identified in the 2016 Census of Population. The figures are not yet available for Census 2022.

Table 3.4 – Persons by Socio-Economic Group, 2016

Socio-Economic Group	State	GDA	Dublin County	Dublin City	Study Area	Kilmainham C ED
A Employers and managers	735,031 (15.4%)	348,591 (18.7%)	241,883 (18.5%)	78,685 (15.0%)	2,589 (11.4%)	561 (11%)
B Higher professional	338,897 (7.1%)	163,667 (8.8%)	124,836 (9.5%)	49,281 (9.4%)	1,781 (7.8%)	291 (5.7%)
C Lower professional	623,756 (13.1%)	237,363 (12.7%)	171,934 (13.1%)	67,162 (12.8%)	2,985 (13.1%)	639 (12.5%)
D Non-manual	996,696 (20.9%)	364,033 (19.5%)	261,082 (19.9%)	107,212 (20.4%)	4,647 (20.5%)	1,065 (20.8%)
E Manual skilled	359,586 (7.6%)	150,215 (8.1%)	96,384 (7.4%)	37,527 (7.1%)	1,832 (8.1%)	323 (6.3%)
F Semi-skilled	369,501 (7.8%)	134,146 (7.2%)	88,725 (6.8%)	38,039 (7.2%)	1,806 (8%)	398 (7.8%)
G Unskilled	153,784 (3.2%)	61,768 (3.3%)	43,541 (3.3%)	22,222 (4.2%)	1,097 (4.8%)	245 (4.8%)
H Own account workers	179,281 (3.8%)	92,556 (5.0%)	60,087 (4.6%)	19,790 (3.8%)	825 (3.6%)	177 (3.5%)
I Farmers	154,022 (3.2%)	21,105 (1.1%)	3,174 (0.2%)	390 (0.1%)	35 (0.2%)	6 (0.1%)
J Agricultural workers	23,145 (0.5%)	5,469 (0.3%)	1,384 (0.1%)	269 (0.1%)	19 (0.1%)	0 (0%)
Z All others gainfully occupied and unknown	828,166 (17.4%)	286,242 (15.3%)	215,824 (16.5%)	104,652 (19.9%)	5,085 (22.4%)	1,410 (27.6%)
Totals	4,761,865	1,865,155	1,308,854	525,229	22,701	5,115

Source: Census of Population 2016

3.6 EDUCATIONAL ATTAINMENT

Advancing from second level education to third level assists the ability of the population to gain access to employment and enter the labour market for higher earnings. Table 3.5 contains CSO data from 2016 relating to the educational attainment of people at national, regional, county, city, and local level.

Table 3.5 – Persons by Educational Attainment, 2016

Education	State	GDA	Dublin County	Dublin City	Study Area	Kilmainham C ED
No Formal Education	52,214 (1.7%)	16,711 (1.4%)	11,856 (1.3%)	5,807 (1.5%)	288 (1.7%)	58 (1.7%)
Primary Education	334,284 (10.8%)	113,325 (9.2%)	81,187 (9.2%)	43,102 (11.3%)	2,291 (13.7%)	377 (11.3%)
Lower Secondary	449,766 (14.5%)	152,464 (12.4%)	102,020 (11.6%)	44,219 (11.6%)	1,910 (11.5%)	362 (10.9%)
Upper Secondary	573,643 (18.5%)	217,173 (17.7%)	149,177 (17.0%)	56,059 (14.7%)	2,300 (13.8%)	453 (13.6%)
Technical or Vocational qualification	271,532 (8.8%)	99,092 (8.1%)	65,919 (7.5%)	25,005 (6.6%)	1,170 (7%)	221 (6.6%)
Advanced Cert. / Completed Apprenticeship	182,318 (5.9%)	63,322 (5.1%)	40,123 (4.6%)	14,191 (3.7%)	619 (3.7%)	134 (4%)

Education	State	GDA	Dublin County	Dublin City	Study Area	Kilmainham C ED
Higher Certificate	153,351 (5.0%)	59,886 (4.9%)	40,165 (4.6%)	14,340 (3.8%)	680 (4.1%)	146 (4.4%)
Ordinary Bachelor Degree or National Diploma	237,117 (7.7%)	99,679 (8.1%)	70,487 (8.0%)	27,047 (7.1%)	1,122 (6.7%)	270 (8.1%)
Honours Bachelor Degree, and/or Professional Qualification	231,293 (10.7%)	156,350 (12.7%)	118,090 (13.4%)	50,756 (13.3%)	2,163 (13%)	440 (13.2%)
Postgraduate Diploma or Degree	284,107 (9.2%)	147,700 (12.0%)	116,562 (13.3%)	43,063 (13.9%)	2,059 (12.3%)	394 (11.8%)
Doctorate (Ph.D.) or higher	28,759 (0.9%)	15,550 (1.3%)	12,643 (1.4%)	5,897 (1.5%)	191 (1.2%)	38 (1.1%)
Not Stated	198,668 (6.4%)	89,037 (7.2%)	70,870 (8.1%)	41,268 (10.8%)	1,887 (11.3%)	436 (13.1%)
Totals	3,097,052	1,230,289	878,829	380,754	16,680	3,329

Source: Census of Population 2016

The table above indicates that 13.2% of people living in the Kilmainham C ED have studied up to Honours Bachelor Degree / Professional Qualification level. A further 11.8% have studied to Postgraduate Diploma or Degree level, which is only higher than the national averages of 10.7% and 9.2% respectively.

Overall, Table 3.5 indicates that when compared to other areas, the resident population of the wider study area, and the Kilmainham C ED is characterised by reasonably average levels of educational attainment. This is consistent with the data in Table 3.4.

3.6.1 Land Use & Settlement Patterns

The site is located within the administrative area of Dublin City Council and is therefore subject to the land use policies and objectives of the County Development Plan 2016-2022 and the Draft County Development Plan 2022-2028.

The subject lands are zoned 'Z14', under the Dublin City Development Plan 2016-2022. The zoning designation has an objective *'to seek the social, economic and physical development and/or rejuvenation of an area with mixed use of which residential and "Z6" would be the predominant uses'*. The zoning map of the County Development Plan 2016-2022 also stipulates the site as 'Strategic Development & Regeneration Area No. 9'.

It is also noted that there are no significant changes proposed to the land-use zoning policy of the subject lands in the Dublin City Draft Development Plan 2022-2028, with a slight change in the objective of 'Z14 – Strategic Development and Regeneration Area' lands, to read; *"To seek the social, economic and physical development and/or regeneration of an area with mixed use, of which residential would be the predominant use."*

Figure 3.4 – Land Use Zoning Map (Dublin City Development Plan 2016-2022), showing subject site in orange

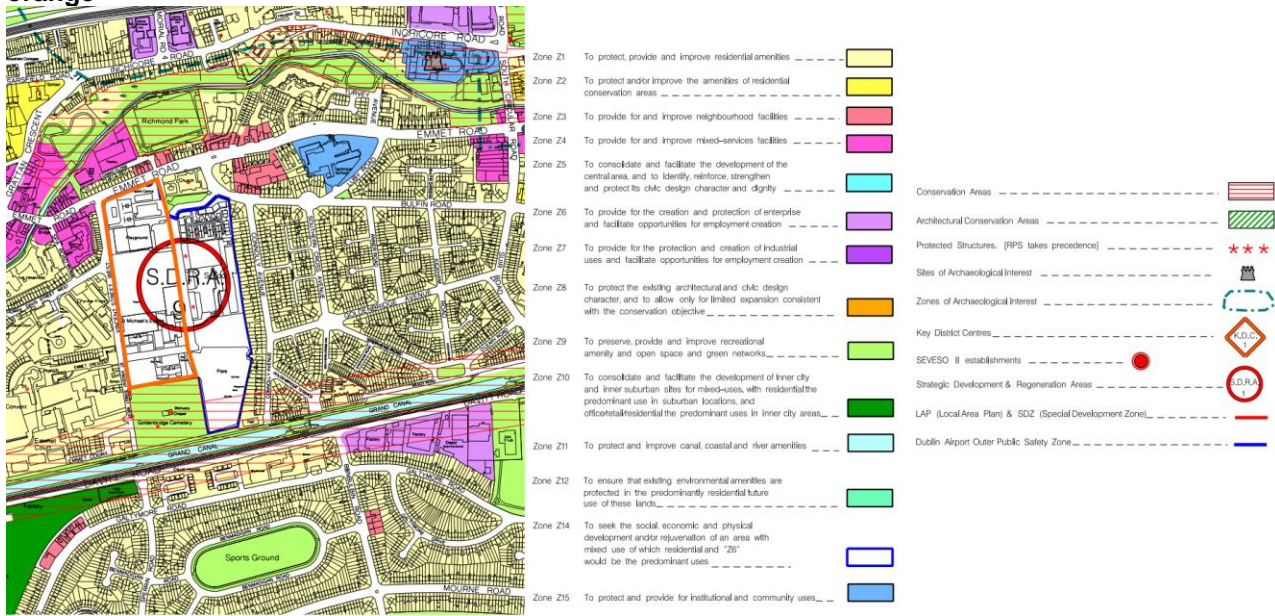
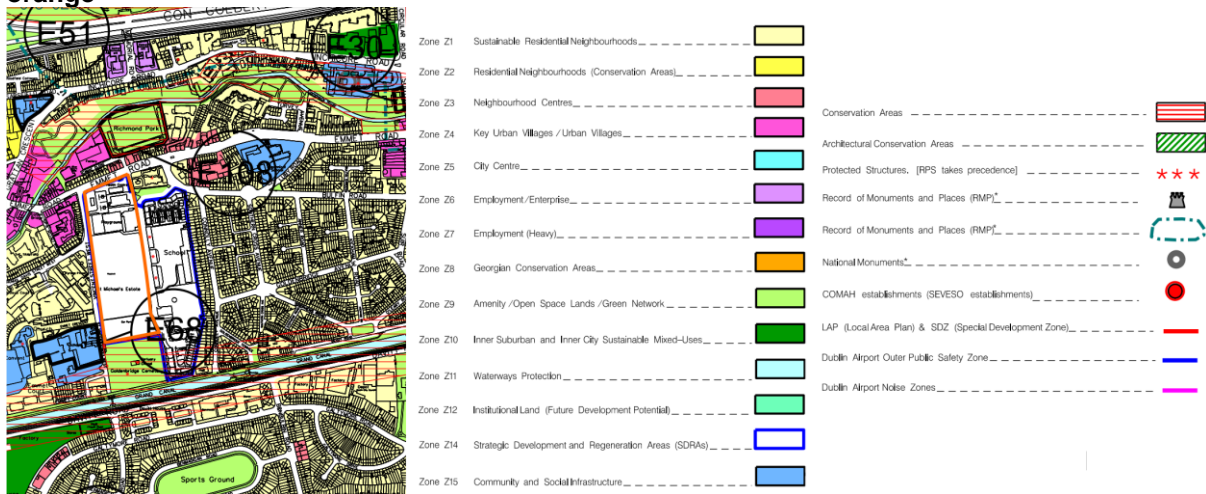


Figure 3.5 – Land Use Zoning Map (Dublin City Draft Development Plan 2022-2028), showing subject site in orange



The following land uses are permissible in Z14 lands:

Figure 3.6 – Land Use Zoning Matrix (Dublin City Development Plan 2016-2022)

Zoning Objective Z14

Permissible Uses

Betting office, buildings for the health, safety and welfare of the public; childcare facility, community facility, conference centre, cultural/recreational building and uses, education, embassy office, embassy residential, enterprise centre, green/clean industries, halting site, home-based economic activity, hotel, industry (light), live-work units, media-associated uses, medical and related consultants, offices, open space, park and ride facility, part off-licence, place of public worship, public service installation, residential, restaurant, science and technology-based industry, shop (neighbourhood), training centre.

Open for Consideration Uses

Advertisement and advertising structures, bed and breakfast, car park, car trading, civic and amenity/recycling centre, factory shop, financial institution, funeral home, garage (motor repair/service), garden centre, golf course and clubhouse, hostel, internet café, nightclub, off-licence, outdoor poster advertising, petrol station, pigeon lofts, public house, take-away, veterinary surgery, warehousing (retail/non-food)/retail park, warehousing.

Figure 3.7 – Land Use Zoning Matrix (Dublin City Draft Development Plan 2022-2028)**Z14 – Permissible Uses**

Assisted living/retirement home, beauty/ grooming services, bed and breakfast, buildings for the health, safety and welfare of the public, café/ tearoom, childcare facility, community facility, conference centre, craft centre/ craft shop, cultural/recreational building and uses, delicatessen, education, embassy office, embassy residential, enterprise centre, financial institution, guesthouse, halting site, home-based economic activity, hotel, industry (light), live-work units, media-associated uses, medical and related consultants, mobility hub, office, off-licence, off-licence (part), open space, park and ride facility, place of public worship, primary health care centre, public house, public service installation, residential, restaurant, science and technology-based industry, shop (local), shop (neighbourhood), sports facility, student accommodation, take-away, training centre, veterinary surgery.

Z14 – Open for Consideration Uses

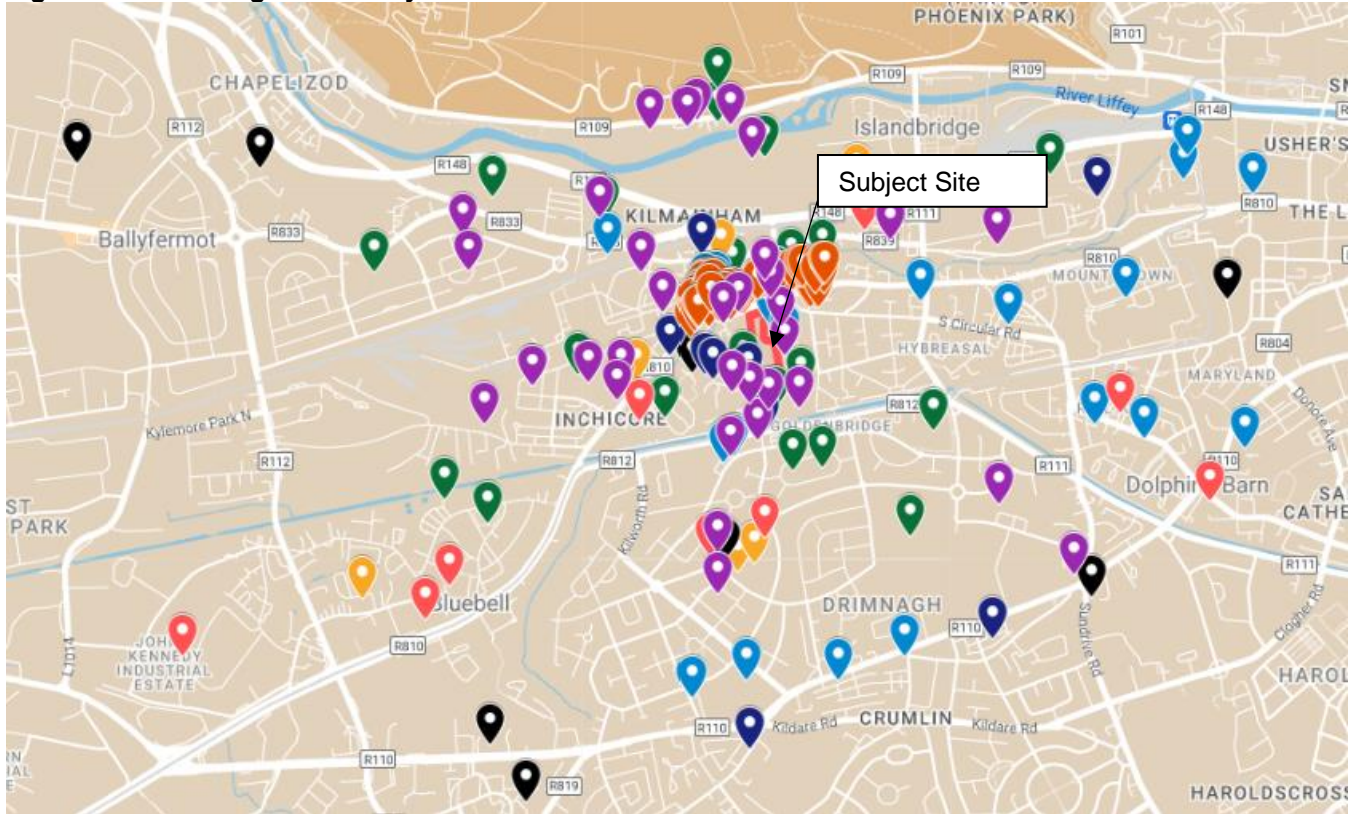
Advertisement and advertising structures, betting office, Build To Rent residential, car park ancillary to main use, car trading, civic and amenity/recycling centre, cultural, creative and artistic enterprises and uses, funeral home, garage (motor repair/service), garden centre/ plant nursery, hostel (tourist), internet café/call centre, laundromat, nightclub, office-based industry, outdoor poster advertising, petrol station, pigeon lofts, postal hotel/motel, shop (district), shop (factory shop), warehousing (retail/non-food)/retail park, warehousing.

Therefore, the residential, community facility, retail and open space uses are permissible uses.

The predominant land-use typology of the surrounding area is generally characterised by existing residential development to the east and west. A mix of commercial and community facilities including retail, educational and healthcare facilities are found along Emmett Road to the north, but also in the form of Mercy Secondary School to the west and Inchicore Primary Care Centre and Richmond Barracks Library to the east. Green, amenity space dominates the land-use pattern to the south of the subject site with Goldenbridge Cemetery and the Grand Canal Greenway. Within a short walking distance, the core of Inchicore provides a wide array of retail (i.e., Tesco, Spar, Minimarket Polish Ethnic Food Store), healthcare (i.e., Inchicore Medical Centre, life Pharmacy, Inchicore Pharmacy) and community (i.e., Scoil Mhuire gan Smál, Oblates Church, Inchicore Community Hall and The Black Lion Public House) facilities and amenities.

A Community and Social Audit has been prepared by John Spain Associates which mapped the key resources within 1.5km of the subject site in the above categories. 1.5 km is considered a reasonable maximum distance to travel via range of transport including walking, cycling and public transport. The area is well provided for in many regards, as such the list is not exhaustive due to the number of such facilities nearby, instead the survey focuses on the most convenient and relevant such facilities. As can be seen below the site is regarded as being very well served by existing community facilities.

Figure 3.8 – Existing Community Facilities within the catchment area of 1.5km



Legend - Existing Community Facilities

Type	
Community	●
Open Spaces	●
Primary Schools	●
Secondary Schools	●
Childcare Services	●
Religious	●
Healthcare Facilities	●
Retail	●

3.6.2 Housing

In terms of housing delivery, the proposed development is located at a location which is zoned for development, and which is appropriate for the uses proposed. There is a significant and established housing need in the Greater Dublin Area, including Dublin City, and the State as a whole, as recognised within Government housing and planning policy, including the 2016 Rebuilding Ireland Plan for Housing and Homelessness and Housing for All 2021.

Recent trends show that population growth is set to continue having regard to the Region's young demographic profile and a return to net inward migration. In fact, the level of in-migration to Ireland experienced over the last two years was in the order of 30,000.

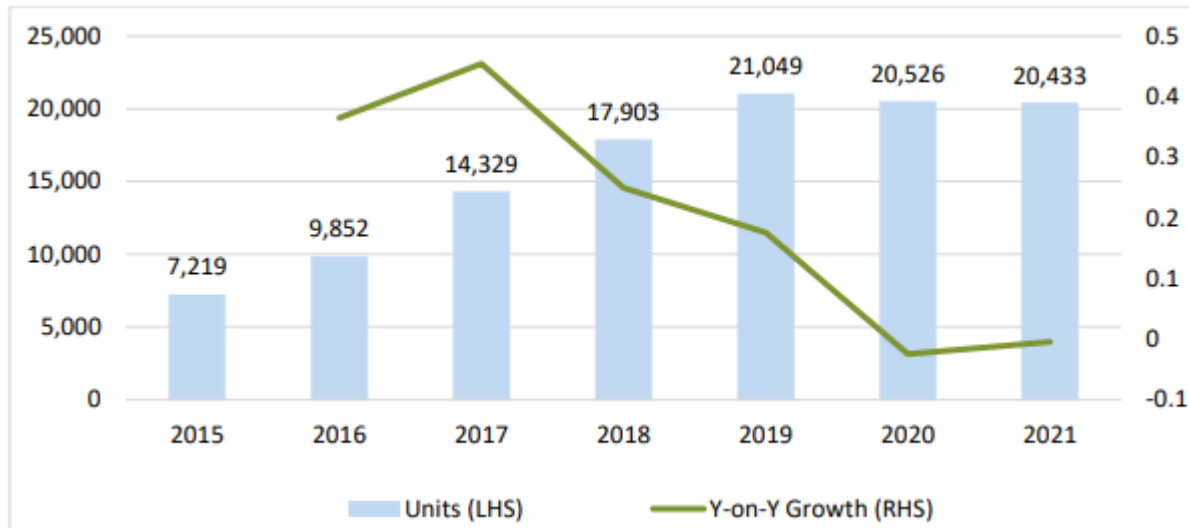
While the number of residential units being completed yearly nationally has rebounded, the level of completions remains significantly less than the estimated equilibrium demand for housing in the State. Moreover, the current level of housing need and demand is not at equilibrium, being significantly augmented by the extremely low level of housing completions in the decade since 2010. Over this period, a significant shortfall in housing has amassed year on year, which is reflected in the data collected in Census 2016 – which revealed overcrowding and increasing numbers of households living in cramped conditions.

It is further noted that the number of housing completions in the state reduced significantly (falling well below projected completions) since 2020, due to the impact of the ongoing Covid-19 public health crisis. There had been a gradual increase in the number of completions over the past decade as supply increased to meet the level of structural demand, estimated by the ESRI to be in the region of 35,000 new homes a year.

According to the ESRI, (Summer Commentary 2022), *In the first quarter of 2022, a total of 6,997 residential units were completed; a 143 per cent increase on the same period in 2021. However, it must be noted that Q1 2021 posted an extremely low level of completions due to the public-health related sector shutdowns.*

The annual level of housing completions for the period 2015 to 2021 are presented below. In total, 20,430 housing units were completed in 2021 which is marginally lower than the figure for 2020.”

Figure 3.9 – Yearly housing completions for the State (ESRI Quarterly Commentary Spring 2022)

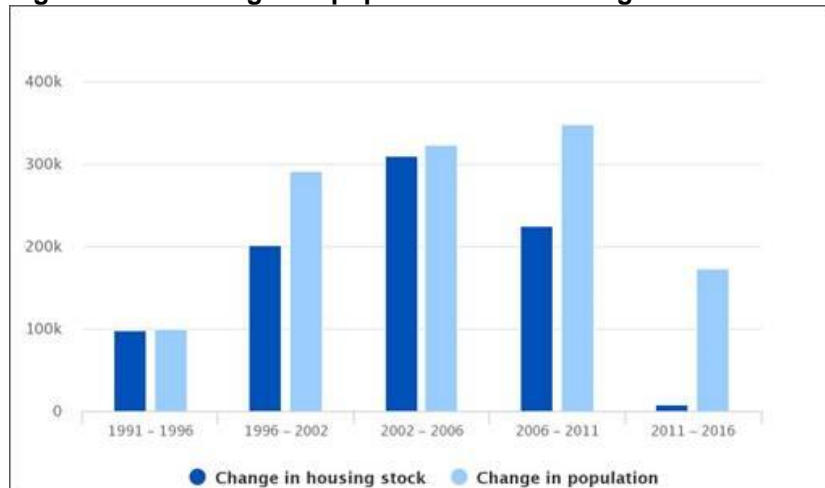


Source: ESRI Summer Commentary 2022

The ESRI state that while the initial COVID pandemic impact led to a marked decline in the number of new commencements, this has risen substantially in 2021. In 2020, a total of 21,686 commencements occurred and this has increased to over 30,000 for 2021. This represents a rapid increase in new unit starts and likely points to an escalation in the provision of new housing supply.

The ESRI notes that there was a notable moderation in the number of commencements in Dublin and Mid East stating that *“Commencements in the first quarter of 2022 were above the level of Q4 2021 but lower than either Q2 or Q3. What is notable from the geographic breakdown is that the Dublin and Mid-East region has experienced a notable moderation in the number of units completed while the rest of the country has experienced quite a pick-up in investment levels. Given the requirements for housing units in the capital city and surrounding areas, it is notable that these areas have experienced quite a slowdown over the past 12 months.”*

Figure 3.10 – Changes in population and housing stock for Ireland, 1991-2016

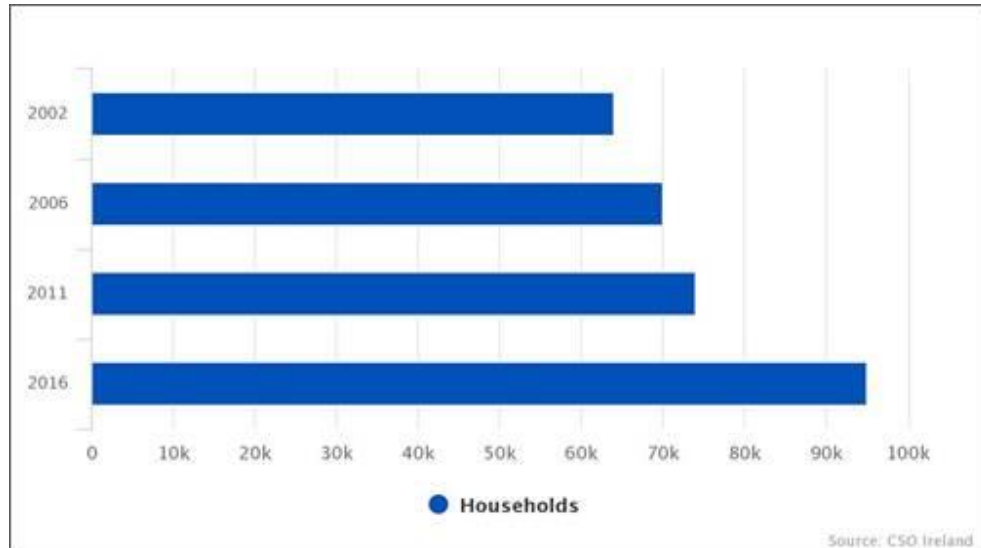


Source: Central Statistics Office, 2017

Census 2016 revealed an increase in the national housing stock of just 8,800 units during the five-year intercensal period (taking into account obsolescence during that period) representing an increase of just 0.4 percent (as shown in the figure below).

This is notable given the increase in population seen concurrently (173,613 or 3.8%). Furthermore, almost 40% of these additional units were one off houses, the majority of which would never have come to market. Census 2016 also revealed a rise in the average household size (from 2.73 to 2.75) (CSO, 2017). This was attributed to household formation falling behind population growth, another indicator of lacking housing availability and increasing housing need.

Figure 3.11 – Number of households with more persons than rooms



Source: Central Statistics Office, 2017

The 2011-2016 intercensal period also saw a notable increase in the number of households with more persons than rooms in their dwelling (see figure below). There were 95,013 permanent households with more persons than rooms according to Census 2016, a 28 per cent rise on the equivalent number in 2011 (73,997).

Close to 10 per cent of the population resided within these households in 2016 at an average of 4.7 persons per household. This is an indicator of increased overcrowding (and housing need) which may be attributed to lack of housing availability and rising costs.

These figures set out above all point to a significant and increasing housing need in the state which is not being met at present.

The Central Bank of Ireland has published a study entitled ‘Population Change and Housing Demand in Ireland’¹⁰, which includes the following key points:

- *“Growth in population has significantly exceeded the increase in the housing stock since 2011 and the average household size has risen, reversing a previous long-running trend.*
- *To keep pace with population growth and changes in household formation, our estimates indicate that an average of around 27,000 dwellings would have been required per annum between 2011 and 2019.*
- *Assuming unchanged household formation patterns and net inward migration close to current levels, around 34,000 new dwellings would be required each year until 2030.”*

3.6.3 Health & Safety

As set out in chapter 14, the surrounding context consists of a mix of residential cultural, cemetery and commercial lands. It does not include any man-made industrial processes (including SEVESO II Directive sites (96/82/EC & 2003/105/EC) which might result in a risk to human health and safety. From a review of the Dublin City County Council Development Plan Map E there are no SEVESO Site as defined by the Health and Safety Authority, on the subject site of the proposed development, in the immediate vicinity, or in the surrounding Inchicore Village.

3.6.4 Risk of Major Accidents and Disasters

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

In this respect, taking cognisance of the other chapters contained within this EIAR document, the proposed development site does not present risks of major accidents or disasters, either caused by the scheme itself or from external man made or natural disasters. Chapter 8 (Water) sets out that the proposed development site is located within Flood Risk Zone C, which is appropriate for a residential development.

3.7 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Consideration of the characteristics of the proposed development allows for a projection of the level of likely significant direct and indirect effects on any particular aspect of the environment that could arise. In this chapter the potential impact on population and human health is assessed. A full description of the proposed development is provided in Chapter 2 of this EIAR document.

In summary, the proposal will comprise c. 578 no. apartments supplemented and supported by community facilities (Community Hub/Library, Creche, Retail/Retail related services, Café units) in a neighbourhood centre which includes a supermarket fronting onto Emmet Road. Based on the mix and potential occupancy the proposal could potentially result in a population of c. 1,156 when fully built and occupied (based on 1 person per studio apartment, 1.5 persons per 1 bedroom apartment, 2.5 persons per 2 bed apartment and 3.5 persons per 3 bed apartment).

The assessment includes the demolition of the 2 no structures located in the northern part of the site (former health centre and St. Michael’s community centre), relating to a permitted Part 8 under 2221/21.

3.8 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

3.8.1 Introduction

This section provides a description of the specific, direct and indirect, impacts that the proposed development may have during both the construction and operational phases of the proposed development. As stated, guidance documents from the EPA and the Department outline that the assessment of impacts on population and human

¹⁰ Available at: <https://www.centralbank.ie/news-media/press-releases/press-release-economic-letter-population-change-and-housing-demand-in-ireland-10-december-2019>

health should focus on health issues and environmental hazards arising from the other environmental factors and does not require a wider consideration of human health effects which do not relate to the factors identified in the EIA Directive. Additionally, this section addresses the socio-economic and employment impacts of the proposed development.

The specific chapters of the EIA (4-15) assess the environmental topics outlined in the EIA Directive.

3.8.1.1 Water

Construction Phase

Provision of water infrastructure for the proposed development would involve construction activities within the subject lands comprising trench excavations conducted in parallel with the other services. The potential impact on the local public water supply network would be short term and imperceptible. Therefore, the impact on human health and population in this regard is considered to be imperceptible.

During the course of the construction phase of the proposed development, there is potential, in the absence of mitigation, for surface water runoff to suffer from increased levels of silt or other pollutants, in addition to potential pollution from spillages, wheel washing and water from trucks on site. The Preliminary Construction and Environmental Management Plan, and the Construction and Demolition Waste Management Plan (CDWMP) set out how all materials will be managed, stored and disposed of in an appropriate manner, mitigating the potential negative effects as outlined. These are contained in Volume III Appendix B of this EIA.

Potential impact on water is addressed in Chapter 6 (Water) and a number of mitigation measures are outlined in that chapter of this Environmental Impact Assessment Report. These mitigation measures will serve to minimise potential adverse impacts of the construction phase to the water environment, thereby minimising any associated risk to human health from water contamination. Therefore, the impact of construction of the proposed development in relation to water is likely to be short-term and imperceptible with respect to human health.

Operational Phase

All new foul drainage lines will be constructed in accordance with Irish Water Standards. Foul sewers will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational.

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

Surface water runoff from the site will be attenuated to the greenfield runoff rate as part of the greater subject lands as outlined in the Engineering Services Report prepared by OCSC Consulting Engineers prepared for this application. Surface water discharge rates will be controlled in conjunction with attenuation storage.

SuDS features such as swales and filter drains to provide additional storage and promote infiltration of and treatment of surface water run-off have been provided in landscaped areas.

The use of SuDS mitigation measures in the Operational Phase will result in improved quality of surface water run-off to the off-site drainage network and in the quality the water percolating to the groundwater beneath the site. The impacts of the Operational Phase on hydrology and groundwater post mitigation will consequently be positive, significant, permanent and at the site scale.

The provision of the proposed integrated sustainable drainage network and significant landscaping, as part of the proposed development in the urban environment, offers slight permanent positive impacts on the receiving environment i.e., the hydrology and hydrogeology, as part of the existing site contains buildings and hardstanding that discharge runoff untreated and unattenuated to the local infrastructure.

3.8.1.2 Noise and Vibration

Construction Phase

Noise and Vibration are addressed in Chapter 8 (Noise and Vibration) which was prepared by Byrne Environmental.

During the construction phase there will be extensive site works, involving construction machinery, construction activities on site, and construction traffic, which will all generate noise. The highest noise levels will be generated during the general construction activities and during rock excavation. The construction noise levels will only occur during daytime hours which will serve to minimise the noise impacts at local existing receptors over the course of the construction phase.

Chapter 8 of this EIAR sets out mitigation measures in relation to noise. Any construction activities undertaken on the site will be required to operate below the recommended vibration criteria set out in Chapter 8.

Following the implementation of mitigation and based on the standards which will be maintained, Chapter 8 predicts that vibration impacts during the construction stage will be negative, not significant, and temporary to short term, whereas the noise impacts during the construction phase will be negative, moderate, local, temporary to short term.

Operational Phase

Once operational, if building services plant items are required to serve the development, the cumulative operational noise level at the nearest noise sensitive location within the development (e.g., apartments, etc.) will be designed/attenuated to meet the relevant BS 4142 noise criteria for day and night-time periods.

The operational phase of the development will not adversely impact the existing noise climate at local receptors.

Residual Vibration Impact: The operational phase of the development will not generate ground borne vibration levels.

The identified operational phase residual impacts are neutral, not significant, local and long term.

3.8.1.3 Air Quality & Climate

Construction Phase

During the construction phase, demolition, site clearance and ground excavation works have the potential to generate dust emissions rising from the operation and movement of machinery on site. This could have a potential impact on population and human health.

Various elements associated with the construction phase of the proposed development have the potential to impact local ambient air quality, human health and climate. However, the potential construction phase impacts shall be mitigated as detailed in Chapter 7 and the CMP to ensure there is no adverse impact on ambient air quality for the duration of all construction phase works. It is predicted that the construction phase of the development will not generate air emissions that would have an adverse impact on local ambient air quality or on local human health or on the local micro-climate or the wider macro-climate.

The predicted construction phase residual impacts on air quality will be negative, slight and short-term. The predicted residual operational phase impacts on air quality and climate will be negative, imperceptible and long-term.

3.8.2 Economic Activity

Construction Phase

The construction phase of the proposed development is likely to result in a positive net improvement in economic activity in the area of the proposed development site, particularly in the construction sector and in associated and secondary building services industries. The sector has grown strongly in recent years and this development will help to further enhance growth and reduce the increasing pressure on the housing market. Given the short term negative

economic impact following from the COVID-19 pandemic, this development will help to sustain and promote employment, and short term slight positive impacts.

The construction of the development and all associated infrastructure will precipitate a short term slight positive impact on construction-related employment for the duration of the construction phase. The phased construction of the proposed residential units, open space, childcare facility, commercial units and community spaces alongside associated physical infrastructure will result in a construction period over an approximate 36-48 month timeline (which may be subject to change depending on development of phases) and will consequently enhance economic activity during this period, which is considered to be a slight temporary positive impact. A considerable amount of the work will be undertaken by sub-contractors who will also work elsewhere on a phased basis over the construction phase.

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

Operational Phase

The operational phase of the proposed development will result in the provision of 578 residential units, retail and commercial floorspace, a childcare facility and Community Hub/Library. This has the potential to provide accommodation for approximately 1,136 persons. This increase in occupancy in the area will enhance local spending power and will assist with the delivery of a critical mass of population which will support a wide range of additional local businesses, services, transport infrastructure and employment opportunities, which will accrue as the development of the Planning Scheme progresses. The proposal will provide much needed residential accommodation and accords with National Policy on delivering Sustainable Residential Communities and is considered a positive permanent slight impact.

It is noted the Social Infrastructure Assessment undertook a review of primary and secondary school capacity and no particular constraints were found.

The proposed development also includes commercial development (Creche, supermarket, café and retail/retail service units) along with a Community Hub/Library which will provide employment in the in the area, which is considered a positive, permanent, slight impact.

The proposed development includes a Community Hub/Library of c. 2,810 sq.m, a supermarket c. 2,476 sq. m GFA (1,765 sq. m net) as well as 2 no. cafes 285 sq. m and 5 no. retail/retail related service units (564 sq. m) as well as a creche of 816 sq. m. The estimated employment that will be generated from the non-residential uses is c. 190 jobs. This is based on a number of information sources including the Homes & Communities Agency, Employment Density Guide (2015). The overall effect on employment locally is moderate, positive and permanent.

3.8.3 Social Patterns

3.8.3.1 Construction Phase

The construction phase of the proposed development is unlikely to have any significant impact on social patterns within the surrounding area. Some additional temporary additional local populations may arise out of construction activity. However, these impacts are imperceptible, temporary in nature and therefore not significant.

It is acknowledged that the construction phase of the project may have the potential for some short-term not significant negative impacts on local residents. Such impacts are likely to be associated with construction traffic and possible nuisances associated with construction access requirements. These impacts are dealt with separately and assessed elsewhere in the EIAR, including Chapter 2 - Project Description and Alternatives Examined, Chapter 7 - Air Quality and Climate and Chapter 9 - Noise and Vibration and also Chapter 10 - Traffic and Transportation. Any disturbance is predicted to be commensurate with the normal disturbance associated with the construction industry where a site is efficiently and properly managed having regard to neighbouring activities. The construction methods employed, and the hours of construction proposed will be designed to minimise potential impacts to nearby residents. A Construction Environmental Management Plan (prepared by OCSC) has been prepared and is submitted with this planning application. The mitigation contained in this EIAR, and CEMP will be contained in the contractor's CEMP.

3.8.3.2 Operational Phase

The addition of new residents and an additional employment to the area will improve the vibrancy and vitality of the area and will help to support existing community and social infrastructure. This is an imperceptible positive long-term impact.

The proposed development includes the provision of a childcare facility with a GFA of c. 816 sq.m. This childcare facility will accommodate the likely demand arising from the proposed development.

Once operational, the proposed development will give rise to much needed additional residential accommodation. Residents will spend a portion of their income locally which would not happen without the proposed development. The creche and employment hub will provide some employment opportunities in the operational phase of the development.

The proposal includes social housing, cost rental and private for sale units, which will provide for an enhanced mix of tenures, and add to the existing tenures in the area. The overall benefit to the surrounding area resulting from the proposed development can be considered slight, long term, and positive.

Having regard to the fact that the area within which the development is situated benefits from a good level of social and community infrastructure (as set out in the Social Infrastructure Assessment, prepared by John Spain Associates, included with the application). Inchicore area of Dublin is accessible to a range of local services, recreational facilities including many education facilities, and a range of community and retail facilities located throughout the area.

The elements of the proposed development which will improve and strengthen this social infrastructure (comprising Community Hub/Library, Creche, 5 no. retail/retail service units (as well as a supermarket, and 2 no. cafes), the proposed development will result in a slight positive, long-term impact on social patterns in the operational phase.

3.8.4 Land-Use & Settlement Patterns

3.8.4.1 Construction Phase

The construction phase of the proposed development will primarily consist of demolition (relating to a permitted Part 8 development relating to the demolition of the existing structures on the site (Planning Reg. Ref. 2221/21), site clearing, excavation and construction works, and the erection of the proposed new buildings on site and has the potential to impact adversely and result in the temporary degradation of the local visual environment on a short-term basis. The visual impacts precipitated by the proposed development are assessed in greater detail in Chapter 9 of the EIA 'Landscape and Visual Impacts'.

Secondary land use impacts include off-site quarry activity and appropriate disposal sites for removed spoil and other materials transported off site. Chapter 11 Material Assets Waste considers these potential impacts in more detail and Chapter 11 (as well as the Construction and Demolition Waste Management Plan) describes the relevant mitigation measures).

The phase may result in a marginally increased population in the wider area due to increased construction employment in the area, however, this would be temporary in nature and the impact would be imperceptible.

3.8.4.2 Operational Phase

The operational phase of the proposed development will result in the introduction of a sustainable density of residential development, delivering wider public realm improvements, in accordance with national and local planning policy objectives which seeks to deliver compact growth at suitable locations (in proximity to existing public transport). Adequate provision of high-quality housing to serve the existing and future population of the county and the wider Greater Dublin Area is an important contributor to the establishment and maintenance of good human / public health. The high-quality design of the proposed development will contribute to a positive impact on the wellbeing of future residents.

As set out in the Social Infrastructure Assessment, prepared by John Spain Associates, included with the Part 10 application, the additional demand for primary school and secondary school arising from the proposed development can be accommodated within the existing schools in the area. The proposed development will result in a new residential community and alter the land use on the subject site to a mixed-use development which will include

residential, retail, cultural, and childcare uses as well as public open space. The operational phase of the development is considered to be a long term local positive impact.

3.8.5 Housing

3.8.5.1 Construction Phase

The proposed development will not result in any impact in terms of loss of housing stock during the construction stage.

3.8.5.2 Operational Phase

The operational phase of the proposed development will see the delivery of 578 no. residential units in a mix of social, cost rental and for sale apartments, which will provide a mixed tenure within the scheme. Further detail is provided in the Housing Mix Report, prepared by John Spain Associates, included in the Part 10 application.

The proposed development will respond to established housing need and demand in the area of the proposed development, and the wider region. The proposed residential units will assist in addressing the significant shortfall of residential development, which has been further impacted by the COVID-19 crisis.

The proposed development delivers a range of housing unit sizes and types, including studio, one-, two-, and three-bedroom apartments. The scheme also benefits from a high level of good quality public open space, with linkages provided through the existing public transport infrastructure in the area, such as the Luas to the south, an bus routes to the north at Emmet Road.

The delivery of 578 no. well-designed high-quality residential units at an appropriate location close to public transport links will have a direct, positive, and significant impact on housing provision and will support the population growth targeted for Dublin City.

3.8.6 Employment

The impact of the proposed development in relation to employment has been discussed under economic activity.

3.8.7 Health & Safety

The surrounding context consists of a mix of residential, employment and retail (in Inchicore village). It does not include any man-made industrial processes (including SEVESO II Directive sites (96/82/EC & 2003/105/EC) which might result in a risk to human health and safety. It is not within the consultation zone of a SEVESO Site as defined by the Health and Safety Authority. Chapter 14 – Risk Management addresses the potential health and safety aspects of the proposed development during the construction and operational phases.

In the absence of mitigation, the proposed development could have a slight negative, short-term impact on the surrounding area during construction phase due to traffic and associated nuisance, dust and noise. These issues and appropriate mitigation measures are addressed in Chapters 7, 8 and 12 of the EIAR, in the Traffic and Transportation Assessment, Construction Management Plan and the Waste Management Plan which accompany the application. The Traffic and Transportation Chapter recommends that a Construction Traffic Management Plan be implemented for the site which will minimise disruption to the surrounding road network, which will be submitted and agreed with the Planning Authority.

No significant health and safety effects are envisaged during either the construction or operational phases of the proposed development. The standard Health and Safety policy, procedures and work practices of the proposed development will conform to all relevant health and safety legislation both during the construction and operational stages of the proposed development. The proposed development will be designed and constructed to best industry standards, with an emphasis being placed on the health and safety of employees, local residents and the community at large.

3.8.7.1 Construction Phase

The construction methods employed, and the hours of work proposed will be designed to minimise potential impacts. The development will comply with all Health & Safety Regulations during the construction of the project. Where possible, potential risks will be omitted from the design so that the impact on the construction phase will be reduced. A Construction Environmental Management Plan (Appendix B Volume III of this EIA) has been prepared by OCSC Consulting Engineers and the measures specified therein will be implemented.

3.8.7.2 Operational Phase

The operational stage of the development will not precipitate long term negative impacts in terms of health and safety. The design of the proposed development has been formulated to provide for a safe environment for future residents and visitors alike. The paths, roadways and public areas have all been designed in accordance with best practice and the applicable guidelines including DMURS. Likewise, the proposed residential, commercial, community and childcare facility units accord with the relevant guidelines and will meet all relevant safety and building standards and regulations, ensuring a development which promotes a high standard of health and safety for all occupants and visitors.

The Air Quality Chapter (Ch 7) of the EIA predicts that the operational phase of the development will not generate air emissions that would have an adverse impact on local ambient air quality or local human health and that there will be a negligible impact on local air quality generated by increased traffic movements associated with the development.

The proposed development will not cause significant impacts on human health and safety once completed and operational, and any impact will be imperceptible, and unlikely.

3.8.8 Risk of Major Accidents or Disasters

Chapter 14 – Risk Management addresses the potential risks of major accidents or disasters relating to the proposed development during the construction and operational phases.

3.8.8.1 Construction Phase

The location of the proposed development is within Flood Zone C, and it is unlikely there will be any impacts related to a major accident or disaster during the construction phase of the proposed development, stemming internally from within the development, or externally.

The works proposed in proximity to roadways will be governed by best practice and appropriate safety procedures, ameliorating any risk of a major accident in those contexts.

3.8.8.2 Operational Stage

The proposed development will be located on land which is not at any significant risk of flooding. The Eastern CFRAM (Catchment Flood Risk Assessment and Management) study details the predicted risk for a variety of fluvial and coastal flood scenarios. The mapping does not include the watercourse reaches affected by the proposed scheme and only maps downstream flooding. The proposed development is therefore outside of the Q100 and Q1000 flood extents and is therefore in within Flood Zone C (low risk of flooding). The proposed development is appropriate for the application site's flood zone categories and that the proposed development is considered to have the required level of flood protection.

Therefore, it is considered that there is no likely significant risk related to major accidents or disasters, external or internal, man-made or natural in respect of the proposed development.

3.9 'DO NOTHING' SCENARIO

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.

A '*do nothing*' scenario would result in the subject lands remaining undeveloped. This would be an underutilisation of the subject site from a sustainable planning and development perspective.

In the do-nothing scenario, the absence of the proposed development would perpetuate the housing shortfall in the Dublin area, contrary to the aims and objectives of national, regional, and local planning and housing policy, all of which promote the delivery of additional housing at strategic locations such as the subject site.

The local economy would not experience the direct and indirect positive effects of the construction phase of development, including employment creation. The local construction sector and associated industries and services would be less viable than they might otherwise be.

The '*do-nothing*' scenario would result in the status of the environmental receptors described throughout this EIAR document remaining unchanged. The potential for any likely and significant adverse environmental impacts arising from both the construction and operational phases of the proposed development would not arise. In terms of the likely evolution without implementation of the project as regards natural changes from the baseline scenario, it is considered there would be limited neutral change from the baseline scenario in relation to population (human beings) and human health.

3.10 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

Avoidance, remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential likely and significant environmental impacts.

3.10.1 Construction Phase

A range of construction related remedial and mitigation measures are proposed throughout this EIAR document with reference to the various environmental topics examined and the inter-relationships between each topic. These remedial and mitigation measures are likely to result in any significant and likely adverse environmental impacts on population and human health during the construction phases being avoided. Readers are directed to Chapter 16 of this EIAR document which summarises all of the remedial and mitigation measures proposed as a result of this EIAR. In order to protect the amenities enjoyed by nearby residents, premises and employees the application includes a Construction Management Plan and the contractor will develop this and submit for further approval and implemented during the construction phase. The content of the CMP will be based on the mitigation set out in this EIAR.

With reference to the construction phase of the proposed development, the objectives of the Resource & Waste Management Plan prepared by Byrne Environmental (refer also Chapter 11 of the EIAR) is to ensure that waste generated during the proposed construction and operation phases will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts 1996 - 2013 are complied with.

3.10.2 Operational Phase

The operational phase is considered to have likely positive impacts on population in relation to the provision of additional residential units, open space, childcare provision, retail and other commercial floorspace to cater for the demands of a growing population in accordance with the residential zoning objectives pertaining to the subject site.

During the operational phase of the development the design of the scheme has had regard to Design Manual for Urban Roads and Streets (DMURS) during its design. This will promote a pedestrian friendly environment, promoting sustainable development and reducing the influence of cars. This has the potential to reduce accidents within the proposed development.

For the operational phase, no further specific mitigation is required having regard to the mitigation included within the other chapters of this EIAR.

3.11 PREDICTED RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

This section provides a qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term permanent, temporary, positive and negative effects as well as impact interactions which the proposed development may have, assuming all mitigation measures are fully and successfully applied. It should be noted that in addition to remedial and mitigation measures, impact avoidance measures have also been built in to the EIAR and project design processes through the assessment of alternatives described in Chapter 2 of this EIAR document. Impact interactions are considered further in Chapter 15.

There are numerous inter-related environmental topics described throughout this EIAR document which are also of relevance to Population and Human Health. For detailed reference to the residual impacts of particular environmental topics please refer to the relevant corresponding chapter of the EIAR (land and soils, water and hydrology, air quality and climate, noise and vibration, traffic, and risk management).

3.11.1 Construction Phase

The construction phase of the proposed development will primarily consist of site clearance, excavation and construction works, which will be largely confined to the proposed development site (including haul routes). Notwithstanding the implementation of remedial and mitigation measures there will be some minor temporary residual impacts on population (human beings) and human health most likely with respect to nuisance caused by construction activities, predominantly related to noise and traffic as detailed in chapters, 8 and 10.

It is anticipated that subject to the careful implementation of the remedial and mitigation measures proposed throughout this EIAR document, and as controlled through the Construction and Environmental Management Plan, any adverse likely and significant environmental impacts will be avoided. The overall predicted likely impact of the construction phase will be short-term not significant, and neutral. A CEMP (with the mitigation contained in this EIAR) will be developed by the contractor and submitted to the Local Authority.

Imperceptible, positive short-term impacts are likely to arise due to an increase in employment and economic activity associated with the construction of the proposed development.

3.11.2 Operational Phase

The proposed development will result in a generally positive alteration to the existing undeveloped site in terms of the provision of residential units to serve the growing residential population of the area in accordance with the objectives of the Dublin City Council Development Plan. Positive impacts on population and human health will include health benefits associated with the provision of a significant quantity of open space, pedestrian and cyclist/green routes, a highly permeable layout which will connect to adjacent development and amenity areas. The provision of creche on site enhances the quality of the development and helps to create sustainable communities.

The implementation of the range of remedial and mitigation measures included throughout this EIAR document is likely to have the impact of limiting any adverse significant and likely environmental impacts of the operational phase of the proposed development on population and human health (as set out in relevant chapters land and soils, water and hydrology, air quality and climate, noise and vibration, traffic, and risk management).

This chapter of the EIAR has provided an assessment of the likely impact of the proposed development on population and human health. As set out above, the proposed development will result in a long-term positive impact on housing and is not likely to result in any significant negative effects on population and human health, and will result in some other positive impacts, including settlement patterns of a sustainable density at an appropriate location and economic benefits derived from the employment opportunities within the childcare facility proposed. Through generating additional economic activity in the area, and providing for a high standard of residential accommodation, there will be a slight positive impact arising from the proposed development in the short-term (for economic activity) and in the long term for residential accommodation.

3.11.3 'Worst-case' Scenario

The failure of the proposed development to proceed will mean that there would be no resulting new housing or local employment generated. However, failure of the proposed development to proceed or failure of any proposed mitigation measures, will not lead to any profound, irreversible or life-threatening consequences. In these circumstances no further consideration of this scenario is necessary in respect of health, community, employment or population issues.

3.12 POTENTIAL CUMULATIVE IMPACTS

The potential cumulative impacts of the proposed development on population and human health have been considered in conjunction with the ongoing changes in the surrounding area. Visits to the subject site and surrounding area and desk-based review of online planning files have been undertaken to identify the existing pattern of development, nearby uses, and any permitted / ongoing developments of relevance to the current proposals in the

context of population and human health. The surrounding area is defined by a broad and varied mix of uses, including residential, commercial, recreational and civic uses.

The construction of the proposed development will influence demographic change, population growth, and the intensity of commercial use in this area, cumulatively contributing to increasing population and employment growth in the wider area which represents a positive cumulative impact which accords with the planning policy context for the area. To the east of the project site there is a permitted 52-unit older persons development (Planning Reg. Ref. 4260/19), and the permitted SHD at the Former Dulux Factory Site, Davitt Road, Dublin 12 for the construction of 265 Build to Let Apartments, 119 car parking spaces, café, including range of communal space on a site of c. 0.8 hectares as well as a recent application for Bus Connects, located to the north of the project site. The associated impacts have been assessed in cumulation with the impacts of the proposed development.

An increase in local housing, and some increase in employment opportunities and service provision (i.e., crèche, Community Hub/Library and shops) has the potential to generate direct and indirect impacts. The visual appearance of the landscape will be altered with the introduction of the proposed built elements including infrastructure, in cumulation with other development in the area. Implementation of the remedial and reductive measures in respect of noise/traffic management etc. in the EIAR would ensure a minimal impact on the existing communities of this area during the construction phase.

The cumulative impact of the proposed development, along with other permitted and existing developments in the vicinity, will be a further increase in the population of the wider area. This will have a moderate positive long-term impact on the population in the immediate area of the subject site, including the wider area of Inchicore.

The adjacent 52 unit older persons development by DCC will result in a marginal increase in population, and not a generator of demand for community infrastructure (such as schools) given the nature of the proposal, but would have an additional demand on local services such as healthcare.

Chapter 7 (Air Quality) states that the operational phases of the subject development and other permitted residential developments in the local area will not generate cumulative air emissions that will have an adverse impact on local ambient air quality. Measured baseline air quality and National published air quality data confirm that the existing air quality is good and that the operational phases of the subject development and other local proposed developments will have a long-term imperceptible impact on existing air quality.

Chapter 8 (Noise and Vibration) states that once the subject development is completed, there will be no residual adverse noise impact on the receiving environment associated with their operation. Increased traffic movements associated with the development will generate a long-term, insignificant impact on the local noise climate during peak hour times.

The overall cumulative impact of the proposed development will therefore be long term and positive as residents and the wider community will benefit from a high quality, visually attractive living environment, with strong links and pedestrian permeability. Having regard to the assessment of cumulative impacts, it is not considered that any additional mitigation measures are required further to those which are outlined above.

3.12.1 Predicted Cumulative Impacts

The cumulative impact of the proposed development, along with other permitted and existing developments in the vicinity, will be a further increase in the population of the wider area. The cumulative impact of the proposed development, along with other permitted and existing developments in the vicinity, will be a further increase in the population of the wider area. This will have a moderate positive long-term impact on the population in the immediate area of the subject site, including the wider area of Inchicore.

Chapter 7 (Air Quality) states that the operational phases of the subject development and other permitted residential developments in the local area will not generate cumulative air emissions that will have an adverse impact on local ambient air quality. Measured baseline air quality and national published air quality data confirm that the existing air quality is good and that the operational phases of the subject development and other local proposed developments will have a long-term imperceptible impact on existing air quality.

Chapter 8 (Noise and Vibration) states that the cumulative noise and vibration impacts associated with the proposed development and future local developments will not result in an increased impact on the closest receptors to the proposed development site.

3.13 MONITORING

In relation to the impact of the development on population and human health it is considered that the monitoring measures outlined in this EIAR in regard to the other environmental topics such as water, air quality and climate and noise and vibration sufficiently address monitoring requirements.

3.14 INTERACTIONS

Please refer to Chapter 16 of the EIAR.

3.15 REINSTATEMENT

While not applicable to every aspect of the environment considered within the EIAR, certain measures may be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact to the environment.

There are no reinstatement works proposed specifically with respect to population and human health.

3.16 DIFFICULTIES ENCOUNTERED IN COMPILING

No significant particular difficulties were experienced in compiling this chapter of the EIAR document.

3.17 REFERENCES

- Central Statistics Office Census data
- ESRI Quarterly Economic Commentary
- Regional Spatial and Economic Strategy for the Eastern and Midlands Regional Assembly, 2019
- Dublin City Development Plan 2016-2022
- Draft Dublin City Development Plan 2022-2028
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018)
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – (EPA, 2022);

4.0 BIODIVERSITY

4.1 INTRODUCTION

This Chapter has been prepared by Dr Siobhán Atkinson of Enviroguide Consulting. It describes the Biodiversity of the Site of the Proposed Development and surrounding environs, with emphasis on habitats, flora and fauna, and details the methodology of assessment used in each case. 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), together with the guidance outlined in the Environmental Protection Agency documents *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (2022) and *Advice Notes for Preparing Environmental Impact Statements* (Draft, September 2015). 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).

4.1.1 Relevant Legislation

4.1.1.1 National Legislation

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. With 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 the 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). 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.

The current list of plant species protected by Section 21 of the Wildlife Act, 1976 (and amendments) is set out in the Flora (Protection) Order, 2022 (S.I. No. 235/2022). The Flora (Protection) Order affords protection to several species of plant in Ireland. 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.

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 transported 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 Habitats Directive, any person who, in regards 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 eggs from the wild or damages or destroys a breeding site or resting place of such an animal shall be guilty of an offence.”*

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.”

4.1.1.2 International Legislation

EU Birds Directive

The Birds Directive constitutes 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.

EU Habitats Directive

The Habitats Directive aims to protect some 220 habitats and approximately 1000 species throughout Europe. The habitats and species are listed in the Directives 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.

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; the second cycle ran from 2016 – 2021, and the current (third) cycle runs from 2022-2027. 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.

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 to give protection to migratory species across borders in Europe.

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 66,994 Ha.

4.2 METHODOLOGY

This section details the steps and methodology employed to undertake an Ecological Impact Assessment of the Proposed Development.

4.2.1 Scope of Assessment

The specific objectives of the study were to:

- Undertake baseline ecological surveys and evaluate the nature conservation importance of the Site of the Proposed Development;
- Identify and assess the direct, indirect and cumulative ecological implications or impacts of the Proposed Development during its lifetime; and
- Where possible, propose mitigation measures to remove or reduce those impacts at the appropriate stage of development.

4.2.1.1 Zone of Influence

The 'zone of influence' (ZOI) for a project is the area over which ecological features may be affected by changes as a result of the Proposed Development and associated activities. This is likely to extend beyond the development site, for example where there are ecological or hydrological links beyond the site boundaries (CIEEM, 2018). The ZOI will vary with different ecological features, depending on their sensitivities to an environmental change. Given the urban context of the Proposed Development, the ZOI is regarded to be relatively limited and within the redline boundary for most ecological receptors, with the exception of aquatic habitats or fauna linked to the Site, and designated sites, e.g., European sites, Ramsar sites, Natural Heritage Areas and proposed Natural Heritage Areas – see below.

To determine the ZOI of the Proposed Development for *designated sites*, reference was made to the OPR Practice Note PN01 - 'Appropriate Assessment Screening for Development Management' (OPR, 2021), a practice note produced by the Office of the Planning Regulator, Dublin. This note was published to provide guidance on screening for appropriate assessment (AA) during the planning process, and although it focuses on the approach a planning authority should take in screening for AA, the methodology is also readily applied in the preparation of Biodiversity Chapters such as this; to identify relevant designated sites potentially linked to the Proposed Development.

In addition, the guidance document published by the Department of Housing, Planning and Local Government (then DEHLG) 'Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities' (2009) was considered, which recommends an arbitrary distance of 15km as the precautionary ZOI for a plan or project being assessed for likely significant effects on European Sites, stating however that this should be evaluated on a case-by-case basis.

As such, the 15km ZOI is used in this report as an initial starting point for collating *designated sites* for this Biodiversity Chapter.

The methodology used to identify relevant designated sites comprised the following:

- Use of up-to-date GIS spatial datasets for designated sites and water catchments – downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) to identify designated sites which could potentially be affected by the Proposed Development;
- The catchment data were used to establish or discount potential hydrological connectivity between the project boundary and any designated sites.
- All designated sites within the ZOI (within 15km of the Proposed Development Site) were identified and are shown in Figure 4.2 and Figure 4.3.
- The potential for connectivity with designated sites at distances greater than 15km from the Proposed Development was also considered in this initial assessment. In this case, there is no potential connectivity

between the Proposed Development Site and designated sites located at a distance greater than 15km based on the Source-Pathway-Receptor model.

- Table 4.6 provides details of all relevant designated sites as identified in the preceding steps. The potential for pathways between designated sites and the Proposed Development Site was assessed on a case-by-case basis using the Source-Pathway-Receptor framework as per the OPR Practice Note PN01 (March 2021). Pathways considered included:
 - Direct pathways (e.g. proximity (i.e. location within the designated site), water bodies, air (for both air emissions and noise impacts).
 - Indirect pathways (e.g. disruption to migratory paths, ‘Sightlines’ where noisy or intrusive activities may result in disturbance to shy species).

4.2.2 Desk Study

A desktop study was carried out to collate and review available information, datasets and documentation sources pertaining to the Site’s natural environment. The desktop study relied on the following sources:

- Information on species records¹¹ and distributions, obtained from the National Biodiversity Data Centre (NBDC) at www.maps.biodiversityireland.ie ;
- Information on waterbodies, catchment areas and hydrological connections obtained from the Environmental Protection Agency (EPA) at www.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 of designated conservation sites, 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 developments, or developments awaiting decision, in the vicinity of the Proposed Development from the National Planning Application Database available at: <https://housinggov.ie/maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de>
- Information on the extent, nature and location of the Proposed Development, provided by the applicant and/or their design team;
- The current conservation status of birds in Ireland taken from Gilbert et al. (2021).
- The Dublin City Development Plan 2016–2022
- The Draft Dublin City Development Plan 2022-2028
- The Dublin City Biodiversity Action Plan 2015-2020
- Draft Dublin City Biodiversity Action Plan 2021-2025

A comprehensive list of all the specific documents and information sources consulted in the completion of this document is provided in section 4.14, References.

4.2.3 Field Surveys

A range of field surveys have been carried out at the Site of the Proposed Development to inform this Biodiversity Chapter. The following sections provide details of the field surveys carried out and a summary of ecological surveys is provided in Table 4.1.

¹¹ The Site of the Proposed Development lies within the 2km grid square O13G and the 1km grid square O1233. Records from the last 20 years from available datasets are given in the relevant sections of this report.

Table 4.1 – Summary of ecological surveys carried out at the Site.

Survey	Survey Date(s)	Surveyor
Habitat and Flora Survey	9 th July 2020 20 th June 2022	Eric Dempsey (Enviroguide) Siobhán Atkinson (Enviroguide)
Invasive Flora Survey	9 th July 2020 18 th May 2021 20 th June 2022	Eric Dempsey (Enviroguide) Siobhán Atkinson (Enviroguide) Siobhán Atkinson (Enviroguide)
Non-volant Mammal Survey	9 th July 2020 20 th June 2022	Eric Dempsey (Enviroguide) Siobhán Atkinson (Enviroguide)
Bat Survey	23 rd July 2020 & 25 th July 2020 14 th September 2021 7 th July 2022	Aisling Walsh (AEE Ltd.) Liam Gaffney (Enviroguide) Aisling Walsh (AEE Ltd.)
Breeding Bird Survey	9 th July 2020 20 th May 2021 20 th June 2022	Eric Dempsey (Enviroguide) Liam Gaffney (Enviroguide) Siobhán Atkinson (Enviroguide)
Wintering Bird Survey	30 th October 2020 28 th November 2020 27 th December 2020 19 th January 2021 24 th February 2021 30 th March 2021 1 st December 2021 20 th December 2021 24 th January 2022 4 th March 2022 21 st March 2022	Eric Dempsey (Enviroguide) Brian McCloskey (Enviroguide)

4.2.3.1 Habitat Surveys

A habitat survey was undertaken by Enviroguide Ecologist and Expert Ornithologist Eric Dempsey at the Site on 9th July 2020. A second habitat survey was undertaken at the Site by Senior Ecologist Siobhán Atkinson on the 20th June 2022. 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. Habitat categories, characteristic plant species and other ecological features and resources were recorded on field sheets. Habitats within the surrounding area of the Proposed Development were classified based on views from the Site and satellite imagery where necessary (Google Earth, Digital Globe and OSI).

4.2.3.1 Invasive Species Surveys

The Site was assessed for the presence of invasive plant species during the breeding bird and ecological surveys undertaken at the Site on the 9th July 2020 by Eric Dempsey and by Senior Ecologist Siobhán Atkinson on the 20th June 2022. An additional invasive species survey was carried out on the 18th May 2021.

4.2.3.2 Mammal Surveys

Mammal surveys of the Site were carried out in conjunction with field surveys undertaken on the 9th July 2020 and 20th June 2022. The Site 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 this survey, the Site was searched for tracks and signs of mammals as per Bang and Dahlstrom (2001).

4.2.3.3 Bat Surveys

July 2020 and July 2022 (AEE Ltd.)

The guidance used for the bat emergence surveys and activity surveys followed Marnell et al (2022)¹² for the July 2022 survey and the older 2006¹³ guidelines for surveys in 2020. The Bat Conservation Trust (2016)¹⁴ Guidelines were used in both July 2020 and July 2022.

There are three main structures onsite which were surveyed (Labelled 1, 2 and 3 as per Figure 4.10). Building 1 and 2 are for demolition. Building 3 will be retained and unaffected.

A bat emergence survey of the 3 no. existing buildings onsite was carried out on the 23rd of July 2020 (21.00 to 23.30, sunset 21.34, temperature 15°C in calm dry conditions) and 7th July 2022 (21.00 to 23.30, sunset 21.31, temperature 22-23°C in dry calm conditions) for the subject site, while a general bat activity survey around the perimeter of the Goldenbridge Cemetery was carried out on 25th July 2020 (21.20 to 23.30, sunset 21.53, temperatures 15-17°C in dry calm conditions).

The equipment used included an Elekon Bat Logger M detector and heterodyne SSF Bat2 Detector. Visual observations were taken with the aid of a powerful L.E.D. torch (AP Pros-Series 220 Lumens High Performance Spotlight).

A Seek Thermal Reveal Pro High-Resolution Thermal Imaging Camera, along with a RIDGID 36848 Micro CA-150 Hand-Held Borescope was available for any inspection of any crevices/roof spaces on the affected building 1 and 2 (where accessible). The borescope is fitted with a camera and allows visibility of confined spaces and narrow passages potentially used by hibernating/roosting bats. It allows spaces up to 3m from ground level to be inspected. All spaces that could potentially allow bats access the buildings were visually examined in detail for bats, signs of bats, or evidence of bat activity, using a torch where necessary. Cracks, crevices etc. were investigated for ingress / egress points and evidence of bat habitation, such as prey items, smearing lines, droppings, and staining. The floors, window sills, and other elevated surfaces were examined closely for droppings. The interior of Buildings No. 2 and No. 3 was also checked for bat signs. Building 1 was not accessible inside.

The BCT guidelines were followed for the assessment rating¹⁵ and classified using Table 4.1 of the BCT guidelines (2016).

The results were used to grade the 3 no. existing buildings as having Negligible, Low, Moderate, or High suitability for roosting bats in accordance with Bat Conservation Trust guidelines¹⁶. Building 3, while not affected, was graded for completeness.

Trees that may provide a roosting space for bats were classified using the Bat Tree Habitat Key (BTHK, 2018) and the classification system adapted from Collins (2016). The Potential Roost Features (PRFs) listed in BTHK (2018) were used to determine the PBR value of trees. Consideration was also given to the classification of trees according to the British Standard BS8956 - Surveying for bats in trees and woodland.

Trees, if identified as Potential Bat Roosts, were inspected during the daytime, where possible, for evidence of bat usage. Evidence of bat usage is in the form of actual bats (visible or audible), bat droppings, urine staining, grease

¹² 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.

¹³ Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

¹⁴ The Bat Conservation Trust (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition
¹⁵ *Bat Surveys for Professional Ecologists, Good Practice Guidelines (2016)*

¹⁶ Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn).

marks (oily secretions from glands present) and claw marks. In addition, the presence of bat fly pupae (bat parasite) also indicated that bat usage of a crevice, for example, has occurred in the past.

A Phase 1 inspection was undertaken to make a list of trees within the Proposed Development Site that may be suitable as roosting sites for bats. Inspections were undertaken visually with the aid of a strong torch beam (AP Pro-Series 220 Lumens High Performance Spotlight) and Celestron 12x56 Prism Binoculars during the daytime searching for PRFs, if visible. To aid this Phase 1 inspection, tree reports, where available, were consulted to supplement the data collected. A RIDGID 36848 Micro CA-150 Hand-Held Borescope for inspection of any accessible crevices on trees (3m from ground).

September 2021 (Enviroguide Consulting)

A dusk bat activity survey was carried out on the 14th September 2021 in optimal survey conditions by Enviroguide Consulting. The bat survey started just before sunset (19:30) and finished at 21:30. Sunset was at 19:45.

The weather was dry, calm and clear with temperatures ranging between 15°C and 19°C.

The bat survey began with an emergence survey of one of the existing buildings present on site; the St. John Bosco Community Centre, as the west side of the building had dense ivy cover on the wall.

The bat surveyor spent from 19:30-20:30 at the north-western corner of this building before walking repeated transects of the entire Site until the end of the survey (21:30).

Fireworks were being set off in the cemetery to the south of the Site and so this was not surveyed on this occasion.

4.2.3.4 Breeding Bird Surveys

A breeding bird survey of the entire Site was undertaken by Enviroguide Ecologist Eric Dempsey at the Site on 9th July 2020. A breeding bird survey of Butterfly bush *Buddleja davidii* scrub habitat to the north of the Site (classified as recolonising bare ground in Figure 4.9) was undertaken by Senior Ecologist Liam Gaffney on the 20th May 2021. This survey was undertaken prior to minor vegetation clearance works to facilitate site investigations to ensure compliance with the Wildlife Acts. A third breeding bird survey of the entire Site was undertaken by Senior Ecologist Siobhán Atkinson at the Site on the 20th June 2022.

4.2.3.5 Wintering Bird Surveys

Summaries of the winter bird surveys carried out at the Site are presented in this EIAR chapter. The full report is available in Appendix F of Volume III of the EIAR.

The survey methodology was as follows:

- Each survey day either commenced at dawn and continued for 6 hours or commenced 6 hours prior to dusk and ended at dusk. These timings were alternated each survey day to capture any possible temporal trends in the usage of the lands by Special Conservation Interest (SCI) species.
- Each day, prior to the commencement of the survey, the Site was walked and checked for any obvious evidence of SCI species usage e.g., Light-bellied Brent Goose (LBBG) droppings.
- Each hour the Site was walked and observed for a period of approx. 20 mins with any SCI species activity on, or in flight over the Site recorded.
- All Special Conservation Interest (SCI) species that were observed visiting the Site or flew overhead were recorded, as were any other species of note e.g., rare passerines etc.

2020-2021 Season

During 2020/21 a total of 6 survey days were carried out at the Site; covering October, November and December 2020 and January, February and March 2021. These surveys provide a summary of the usage of the Site by SCI species during the winter. A total of 36 hours of survey were carried out at the Site.

2021-2022 Season

During 2021/22 a total of 5 survey days were carried out at the Site; covering December 2021, January and March 2022. These surveys provide a summary of the usage of the Site by SCI species during the winter. A total of 30 hours of survey were carried out at the Site.

4.2.4 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 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 (2009) defines key ecological receptors 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, the habitats and species identified as being present or potentially present within the ZOI were assessed. As per the NRA guidelines, impact assessment is only undertaken of key ecological receptors (KERs).

4.2.5 Value of Ecological Resources

The ecological features identified within the Site of the Proposed Development and the wider area are evaluated based on their value. These values are detailed in Table 4.2 below and are taken from the Guidelines for Assessment of Ecological Impacts of National Road Schemes published by the NRA (2009), now Transport Infrastructure Ireland (TII).

Table 4.2 – Description of values for ecological resources based on geographic hierarchy of importance (NRA, 2009).

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.

Importance	Criteria
	<ul style="list-style-type: none"> - 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 o Species listed on the relevant Red Data list. o Site 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. o 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"> 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 o Species listed on the relevant Red Data list. o 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.

4.2.6 Impact Assessment Criteria

Once the value of the identified Key Ecological Receptors (KERs) was determined, the next step was to assess the potential effect or impact of the Proposed Development on these 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 EPA Guidelines (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.

4.2.6.1 Criteria used to define the quality, significance and duration of effects

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the quality of effects. See Table 4.3 below.

Table 4.3 – 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).

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the significance of impacts. See Table 4.4 below.

Table 4.4 – 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 duration and frequency of effects. See Table 4.5 below.

Table 4.5 – 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 RECEIVING ENVIRONMENT (BASELINE SCENARIO)

4.3.1 Desk Study

4.3.1.1 Site Overview

The Site of the Proposed Development is located in the Inchicore/Goldenbridge area of Dublin City, and is bounded to the north by Emmet Road, to the south by Goldenbridge Cemetery, to the east by the former Richmond Barracks and the pedestrian link to the Bulfin estate next to Saint Michael’s Church; and to the west by Saint Vincent Street West. The Site amounts to c. 4.68 hectares in total (inclusive of the area required for upgrade water supply works along Emmet Road). The Site lands consist of several buildings situated in the northern section of the Site, namely a Community Centre and a HSE building with the existing Inchicore Community Sports Centre, located adjacent (outside the project site). There is also an old basketball court located adjacent to these buildings. The entire southern and central sections comprise an open green area with small numbers of young deciduous trees planted along the eastern and western boundaries. The general surroundings of the Site are highly urbanised in nature. As noted above, the Site also includes upgrade water supply works of some 200m along Emmet Road to the junction of Grattan Crescent and Tyrconnell Road.

4.3.1.2 Geology, Hydrology and Hydrogeology

The Site of the Proposed Development is within the Liffey and Dublin Bay catchment and Liffey_SC_090 sub-catchment. The closest surface water body to the Site is the River Camac (EPA code: 09C02). The Camac flows in a north-easterly direction to within ca. 80m of the northern boundary of the main Development Site area. However, the proposed upgrade works to the water supply along Emmet Road to the junction of Grattan Crescent/Tyrconnell road which crosses the River Camac (Figure 4.1). The Grand Canal runs west-east ca. 120m from the Site’s southern boundary, on the opposite side of the Goldenbridge Cemetery (EPA, 2022).

The River Camac was assigned *Poor* water quality status [assessment was made in 2019, at the *Camac Close Emmet Rd* monitoring station (station no. RS09C020500)] and is considered to be *At Risk* of not achieving its Water Framework Directive status objectives. The River Camac eventually discharges to the River Liffey ca. 1.8km to the

north-east of the Site of the Proposed Development. The status of the Upper Liffey Estuary is classed as *Good*, and its risk status is currently under review (EPA, 2022).

Canals are required to achieve good ecological potential rather than good ecological status because they are artificial water bodies. The Grand Canal achieved good ecological potential during the 2013-2018 Water Framework Directive reporting period (O'Boyle et al. 2019).

The Site of the Proposed Development is situated on the Dublin groundwater body, which has *Good* status. Its risk status is currently under review. The aquifer type in the area is *Locally Important* (LI) on bedrock which is moderately productive in local zones only. The groundwater rock units underlying the aquifer are classified as *Dinantian Upper Impure Limestones*. The level of vulnerability to groundwater contamination from human activities is *High* across the Site. The subsoil is classed as *Till derived from limestones*, with soil at the Site assigned to the Teagasc soil group *Made ground* (GSI, 2022).

4.3.1.3 Existing Surface Water Drainage

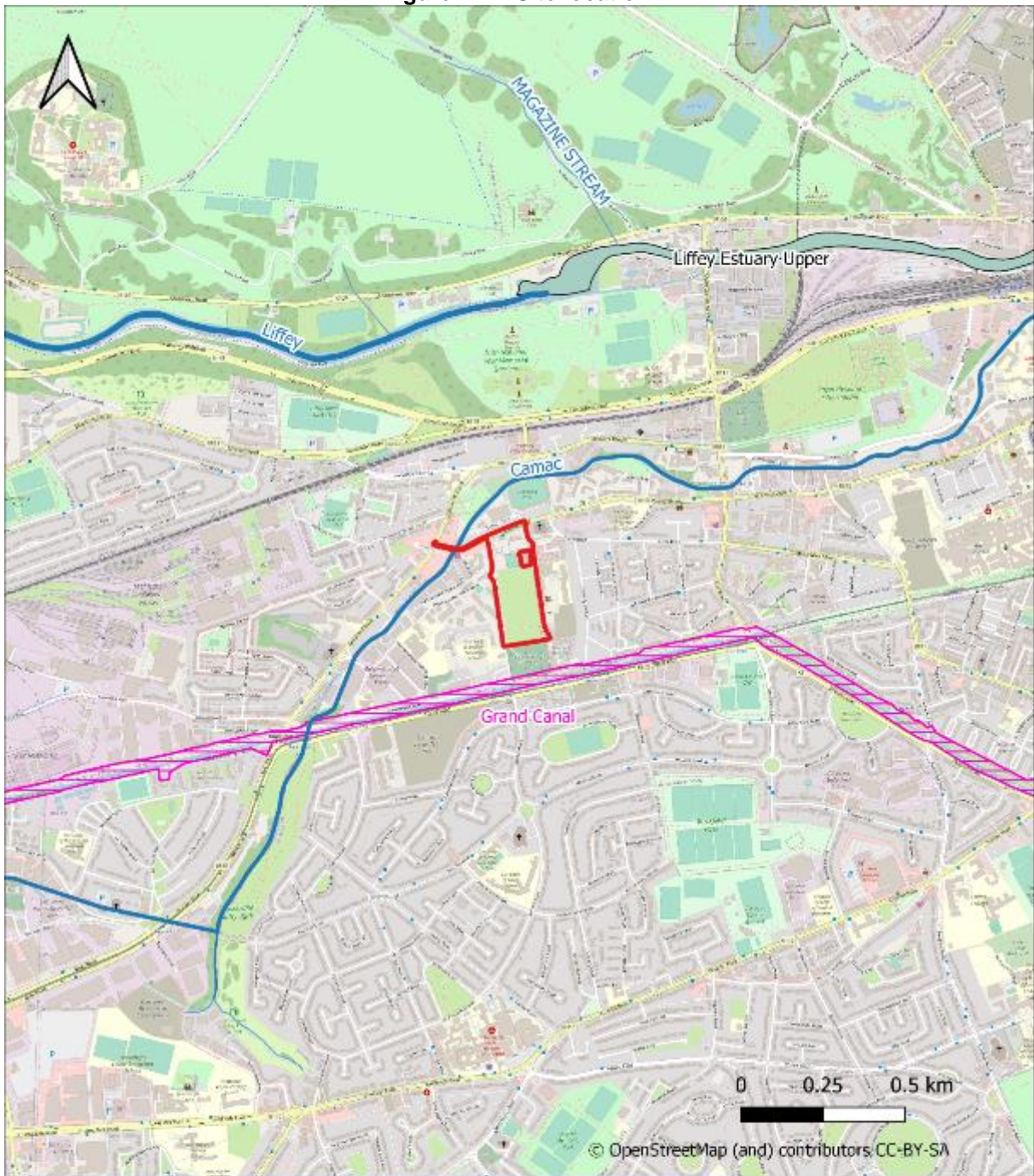
According to OCSC (2022), the Site is currently graded to lower levels in the south-west to north-east direction. The Site therefore naturally drains to Emmet Road located at the northern boundary of the Site, before ultimately discharging to the Camac River located to the north of Emmet road.

The Site and its surroundings are served by a dedicated/separate storm water drainage network (OCSC, 2022). Two main storm drains have been identified serving the Site, the first is a 225mm-diameter concrete sewer which travels along the western boundary of the Site. This sewer later becomes a 300mm diameter sewer before travelling in a westerly direction along Thomas Davis Street West. The Irish Water records drawings indicate that this sewer previously gathered storm drainage from Saint Michael's Estate. However, the drawings from the demolition of St. Michael's Estate and the result of the GPR survey indicate that these connections may have been removed. It is noted that there are discrepancies between the findings of the GPR survey and the record drawings in terms of the plan location and alignment of this sewer- this will need to be further reviewed/verified on site (OCSC, 2022). It is also noted that the sewer passes onto the Site in a number of locations.

The second dedicated storm sewer is a 375mm-diameter concrete sewer which travels along Saint Michael's Estate to the eastern boundary of the Site. This sewer later becomes a 450mm-diameter sewer before travelling under Emmet Road and to the rear of Richmond Park to discharge to the Camac River. Again, the Irish Water Record drawings indicate that this sewer previously gathered storm drainage from Saint Michael's Estate. However, the drawings from the demolition of the Saint Michael's Estate and the results of the GPR survey indicate that these connections may have been removed (OCSC, 2022).

According to OCSC (2022), sections of the existing public drainage infrastructure that is located at St. Michael's Estate and St. Vincent's Street West are to be relocated from within the development boundary to the public road area, so as to facilitate the new development layout, including planting of significant trees, as part of the landscaping proposal.

Figure 4.1 – Site location.



Legend: Site Boundary Hydrology River Network Routes Transitional Water Bodies NPWS Proposed Natural Heritage Area (NPWS, 2015)		Project: Emmet Road Development Client: Dublin City Council Title: Site Location		 Drawn By: SA Checked: LT Date: 20/09/2022 Notes: Site boundaries shown are for illustration purposes only and do not represent legal or road boundaries.	
		Projection: IRENET55 / Irish Transverse Mercator Scale @ A4: 1:15000			

4.3.1.4 Designated Sites

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (79/409/EEC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs). It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected sites throughout the European Community. SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the qualifying interests of the sites; from these the conservation objectives of the site are derived.

National Heritage Areas (NHAs) are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with SAC and/or SPA sites. Although many NHA designations are not yet fully in force under this legislation (referred to as 'proposed NHAs' or pNHAs), they are offered protection in the meantime under planning policy which normally requires that planning authorities give recognition to their ecological value.

Table 4.6 below presents details of the key ecological features of the designated sites within a 15km radius of the Proposed Development. The result of this preliminary screening concluded that there is a total of six SACs, four SPAs and 21 pNHAs located within the ZOI of the Proposed Development Site. The distances to each site listed are taken from the nearest possible point of the Proposed Development Site boundary to nearest possible point of each European site or pNHA. In addition, Dublin Bay is designated as a UNESCO Biosphere. Dublin Bay Biosphere contains three different zones, which are managed in different ways:

- The core zone of Dublin Bay Biosphere comprises 50km² of areas of high natural value. Key areas include the Tolka and Baldoyle Estuaries, Booterstown Marsh, Howth Head, North Bull Island, Dalkey Island and Ireland's Eye.
- The buffer zone comprises 82km² of public and private green spaces such as parks, greenbelts and golf courses, which surround and adjoin the core zones.
- The transition zone comprises 173km² and forms the outer part of the Biosphere. It includes residential areas, harbours, ports and industrial and commercial areas.

There are two Ramsar Sites within the zone of influence of the Proposed Development, namely North Bull Island (site ID 406) and Sandymount Strand/Tolka Estuary (site ID 832) both of which are located in Dublin Bay.

Table 4.6 – Designated sites within the zone of influence (15km)

Site Code	Site Name	Reasons for Designation (* = priority habitats)	Distance to Site
Special Areas of Conservation (SAC)			
000210	South Dublin Bay SAC	Annex I Habitats: [1140] Tidal Mudflats and Sandflats [1210] Annual vegetation of drift lines [1310] Salicornia and other annuals colonising mud and sand [2110] Embryonic shifting dunes	6.8 km

Site Code	Site Name	Reasons for Designation (* = priority habitats)	Distance to Site
000206	North Dublin Bay SAC	Annex I Habitats: [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: [1395] Petalwort <i>Petalophyllum ralfsii</i>	9.3 km NE
001209	Glenasmole Valley SAC	Annex I Habitats: [6210] Orchid-rich Calcareous Grassland* [6410] Molinia Meadows [7220] Petrifying Springs*	9.3 km SW
002122	Wicklow Mountains SAC	Annex I Habitats: [3110] Oligotrophic Waters containing very few minerals [3160] Dystrophic Lakes [4010] Wet Heath [4030] Dry Heath [4060] Alpine and Subalpine Heaths [6130] Calaminarian Grassland [6230] Species-rich Nardus Grassland* [7130] Blanket Bogs (Active)* [8110] Siliceous Scree [8210] Calcareous Rocky Slopes [8220] Siliceous Rocky Slopes [91A0] Old Oak Woodlands Annex II Species: [1355] Otter <i>Lutra lutra</i>	11.0 km S
001398	Rye Water Valley/Carton SAC	Annex I Habitats: [7220] Petrifying Springs* Annex II Species: [1014] Narrow-mouthed Whorl Snail <i>Vertigo angustior</i> [1016] Desmoulin's Whorl Snail <i>Vertigo moulinsiana</i>	11.7 km NW
000199	Baldoye Bay SAC	Annex I Habitats: [1140] Tidal Mudflats and Sandflats [1310] Salicornia Mud [1330] Atlantic Salt Meadows [1410] Mediterranean Salt Meadows	13.8 km NE
Special Protected Area (SPA)			
004024	South Dublin Bay and River Tolka Estuary SPA	Special Conservation Interest Species: [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 tetanus</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] [A194] Arctic Tern <i>Sterna paradisaea</i> [breeding] [passage] [A999] Wetlands	6.2 km E

Site Code	Site Name	Reasons for Designation (* = priority habitats)	Distance to Site
004006	North Bull Island SPA	Special Conservation Interest Species: [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 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] Wetlands	9.3 km NE
004040	Wicklow Mountains SPA	Special Conservation Interest Species: [A098] Merlin <i>Falco columbarius</i> [breeding] [A103] Peregrine <i>Falco peregrinus</i> [breeding]	11.0 km S
004016	Baldoyle Bay SPA	Special Conservation Interest Species: [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] Wetlands	14.2 km NE
Natural Heritage Areas			
<i>There are no NHAs within 15km of the Proposed Development</i>			
proposed Natural Heritage Areas			
002104	Grand Canal	There are no formal qualifying interests listed for proposed Natural Heritage Areas. A general site synopsis is available for most sites on the NPWS website.	0.1 km S
000128	Liffey Valley		2.7 km NW
002103	Royal Canal		3.7 km N
00991	Dodder Valley		5.4 km S
000206	North Dublin Bay		5.9 km NE
000210	South Dublin Bay		6.8 km E
000178	Santry Demesne		7.8 km NE
000201	Dolphins, Dublin Docks		7.9 km NE
001205	Boosterstown Marsh		8.2 km SE
001753	Fitzsimon's Wood		9.2 km SE
001209	Glenasmole Valley		9.3 km S
001212	Lugmore Glen		9.4 km SW
000211	Slade of Saggart and Crooksling Glen		11.7 km SW

Site Code	Site Name	Reasons for Designation (* = priority habitats)	Distance to Site
001398	Rye Water Valley/ Carton		11.7 km NW
001208	Feltrim Hill		13.3 km NE
001206	Dalkey Coastal Zone and Killiney Hill		13.4 km SE
000199	Baldoyle Bay		13.8 km NE
001207	Dingle Glen		13.9 km SE
001763	Sluice River Marsh		14.3 km NE
001202	Ballybetagh Bog		14.4 km SE
000202	Howth Head		14.8 km NE

Figure 4.2 – European sites within 15km of the Site of the Proposed Development Site.

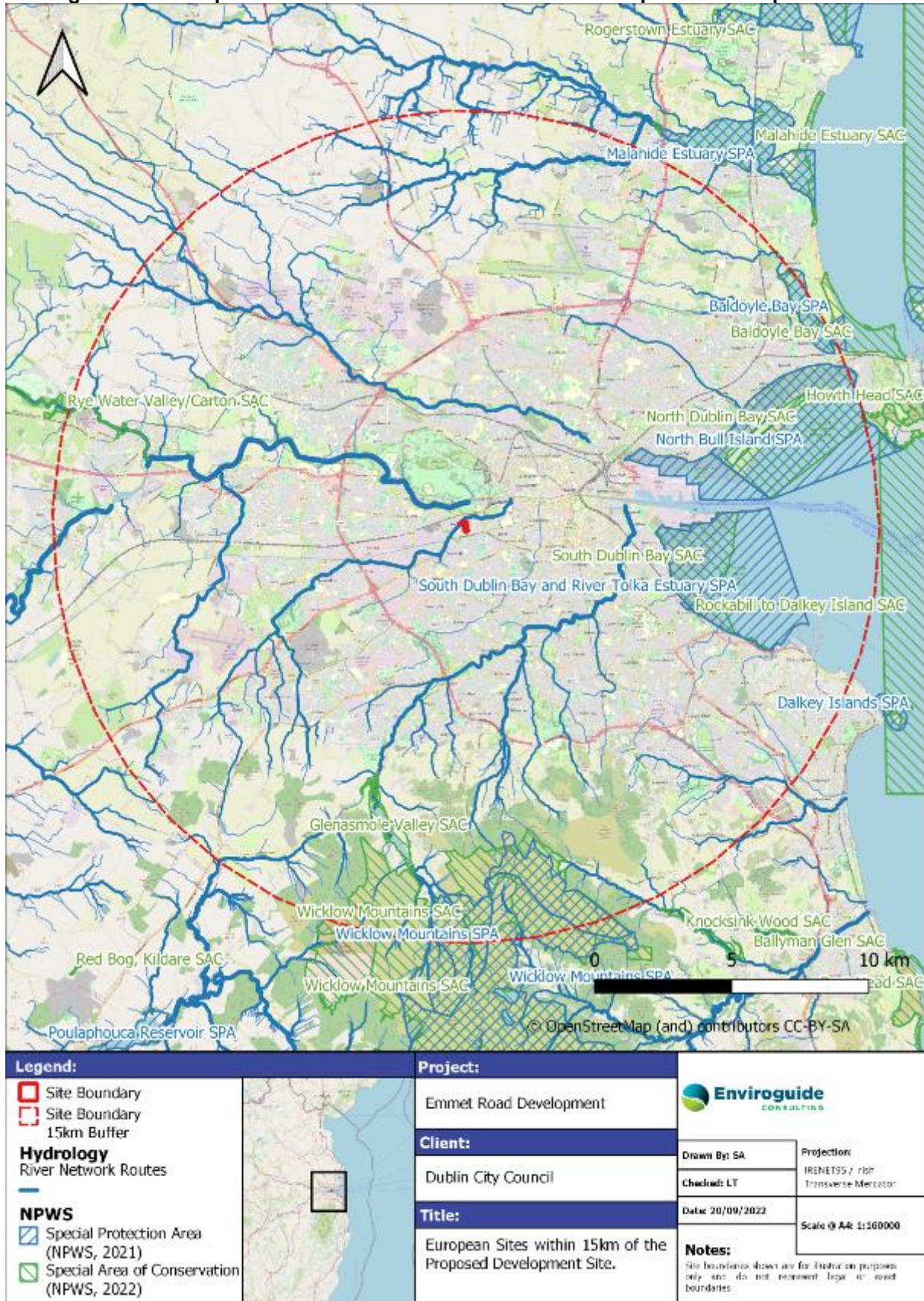
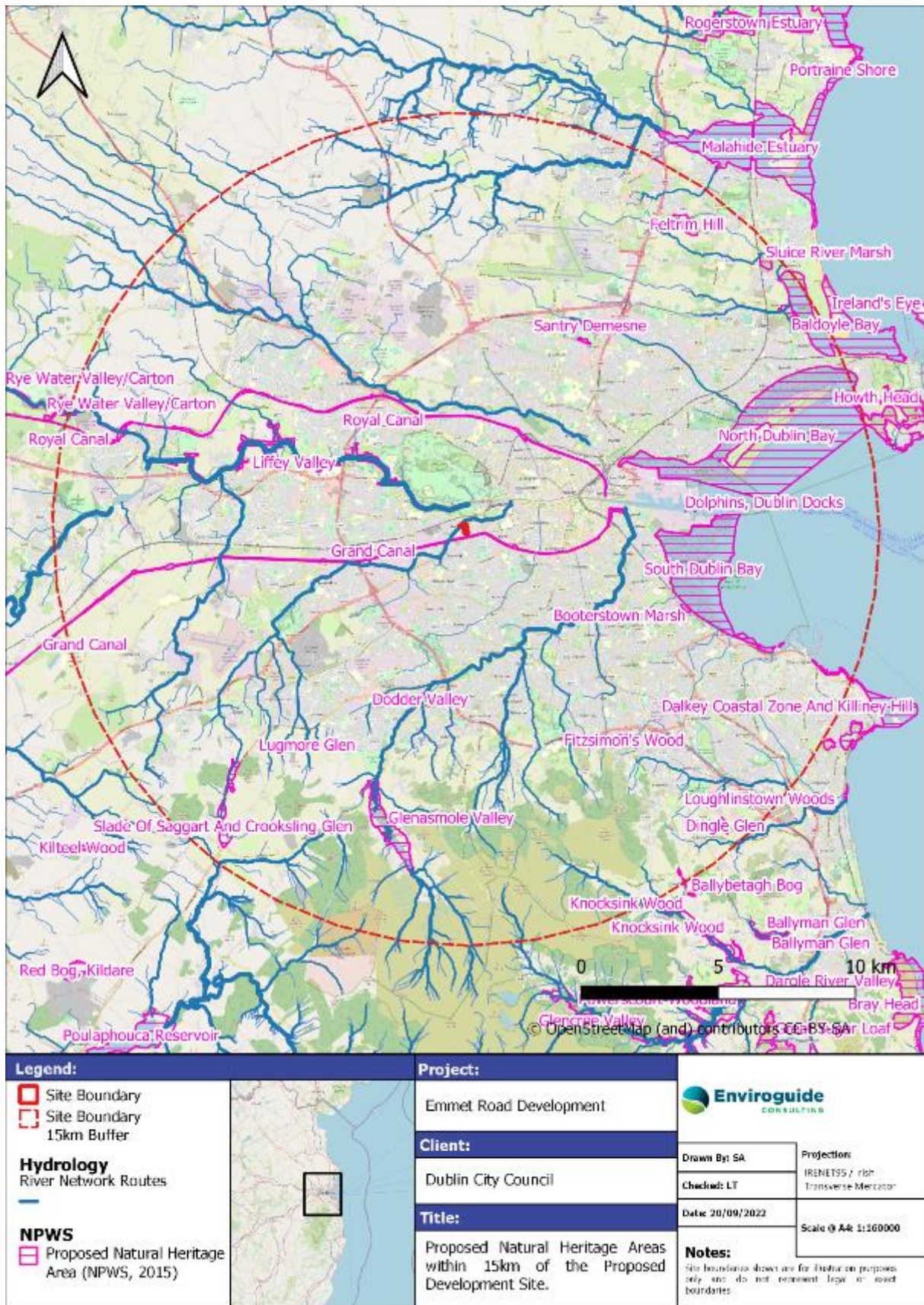


Figure 4.3 – Proposed Natural Heritage Areas within 15km of the Proposed Development Site.



4.3.1.5 Species and species groups

The Site of the Proposed Development is located within the Ordnance Survey Ireland National Grid 2km square 013G. Species records from the National Biodiversity Data Centre (NBDC) online database for this grid square was studied for the presence of rare or protected flora and fauna. In addition, data from various sources (e.g. Inland Fisheries Ireland) were used to determine the presence of species in the vicinity of the Proposed Development. The following sections outline the results of this assessment.

Flora

Rare and Protected Flora

Species records from the NBDC online database were studied for the presence of rare or protected flora species. No rare or protected flora species recorded were found in the 2km grid square.

Invasive Plant Species

The NBDC have records (dated within the last 20 years) of 11 invasive plant species within the 2km grid square associated with the Site. Eight of these are considered 'high impact', whereas three are considered to be 'medium impact'. Four of the invasive plant species recorded by the NBDC are either aquatic or semi-aquatic (Canadian Waterweed, New Zealand Pigmyweed, Nuttall's Waterweed and Parrot's-feather).

Table 4.7 – Invasive plant species within the 2km (O13G) grid square

Name	Date of last record	Database	Legal status / Designation
Butterfly-bush <i>Buddleja davidii</i>	19/04/2020	Online Atlas of Vascular Plants 2012-2020	- Medium Impact Invasive Species
Canadian Waterweed <i>Elodea canadensis</i>	31/07/2009	National Invasive Species Database	- High Impact Invasive - Regulation S.I. 477 (Ireland)
<i>Fallopia japonica x sachalinensis</i> = <i>F. x bohemica</i>	31/07/2009	National Invasive Species Database	- High Impact Invasive - Regulation S.I. 477 (Ireland)
Indian Balsam <i>Impatiens glandulifera</i>	31/07/2009	National Invasive Species Database	- High Impact Invasive Species - Regulation S.I. 477 (Ireland)
Japanese Knotweed <i>Fallopia japonica</i>	03/05/2020	National Invasive Species Database	- High Impact Invasive Species - Regulation S.I. 477 (Ireland)
Narrow-leaved Ragwort <i>Senecio inaequidens</i>	09/08/2020	Online Atlas of Vascular Plants 2012-2020	- Medium Impact Invasive Species
New Zealand Pigmyweed <i>Crassula helmsii</i>	31/07/2009	National Invasive Species Database	- High Impact Invasive Species - Regulation S.I. 477 (Ireland)
Nuttall's Waterweed <i>Elodea nuttallii</i>	31/07/2009	National Invasive Species Database	- High Impact Invasive Species - Regulation S.I. 477 (Ireland)
Parrot's-feather <i>Myriophyllum aquaticum</i>	31/07/2009	National Invasive Species Database	- High Impact Invasive - EU Regulation No. 1143/2014 - Regulation S.I. 477 (Ireland)
<i>Rhododendron ponticum</i>	17/06/2004	Species Data from the National Vegetation Database	- High Impact Invasive Species - Regulation S.I. 477 (Ireland)
Sycamore <i>Acer pseudoplatanus</i>	28/10/2008	River Biologists' Database (EPA)	- Medium Impact Invasive Species

*The records are dated within the last 20 years and are provided by the NBDC.

Fauna

Mammals (excl. bats)

Records for terrestrial mammals were retrieved from the NBDC online database. Three native terrestrial mammals were recorded within the 2km grid square associated with the Site. Of these, only Otter *Lutra lutra* is afforded legal protection (Table 4.8). Two non-native terrestrial mammals were recorded within the 2km grid square, both are considered 'High Impact'.

Table 4.8 – Terrestrial mammal species within the 2km (O13G) grid square

Name	Date of last record	Database	Legal Status / Designation
NATIVE SPECIES			
European Otter (<i>Lutra lutra</i>)	12/02/2016	Mammals of Ireland 2016-2025	- EU Habitats Directive [92/43/EEC] Annex II & IV - Wildlife (Amendment) Act, 2000
Red Fox (<i>Vulpes vulpes</i>)	12/12/2017	Mammals of Ireland 2016-2025	n/a
Wood Mouse (<i>Apodemus sylvaticus</i>)	21/08/2015	Atlas of Mammals in Ireland 2010-2015	n/a
NON-NATIVE SPECIES			
Brown Rat (<i>Rattus norvegicus</i>)	22/05/2016	Mammals of Ireland 2016-2025	- High Impact Invasive Species - Regulation S.I. 477 (Ireland)
Eastern Grey Squirrel (<i>Sciurus carolinensis</i>)	01/09/2018	Mammals of Ireland 2016-2025	- High Impact Invasive - EU Regulation No. 1143/2014 - Regulation S.I. 477 (Ireland)

*The records are dated within the last 20 years and are provided by the NBDC.

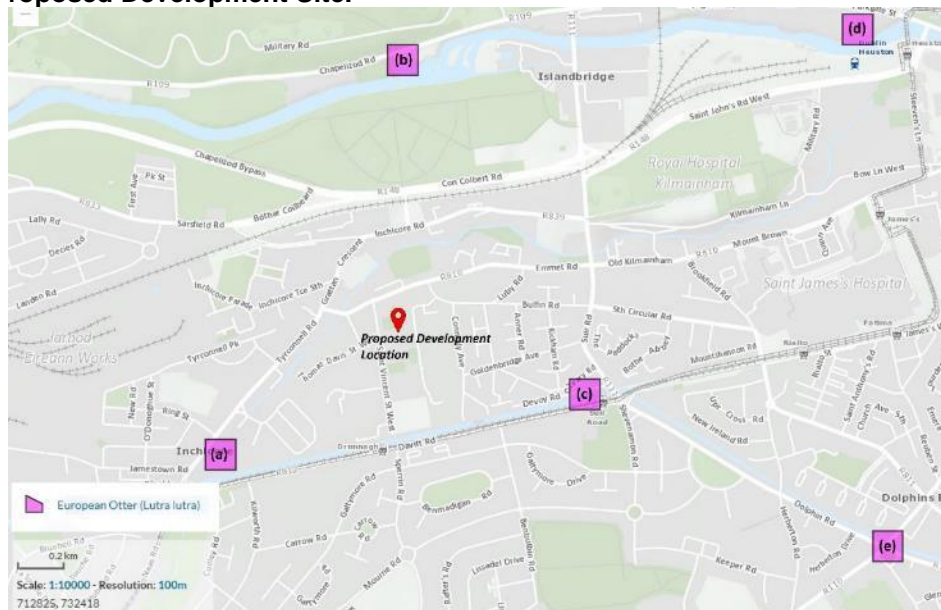
Both the River Camac and the Grand Canal are in close proximity to the Site of the Proposed Development. According to the Dublin City Otter Survey, carried out as part of an Action of the Dublin City Biodiversity Action Plan 2015-2020 (Macklin et al., 2019), Otters do utilise the River Camac. Eight otter signs (4 spraints, 1 couch, 1 latrine, 1 prey remains and 1 active hold) were recorded on the Camac, some of which are in close proximity to the Proposed Development Site (Macklin et al., 2019; Figure 4.4). In addition, several live Otter sightings have been recorded along the Grand Canal in close proximity to the Proposed Development (as surveyed April 2018-April 2019 by Triturus Environmental Ltd., (adapted from Macklin et. al., 2019), Figure 4.5). However, it is not anticipated that Otter would utilise the Site itself due to the lack of suitable habitat and the urban buffer that exists between the Site and these waterbodies.

Figure 4.4 – Otter sign distribution on the surveyed reaches of the Camac and Poddle rivers



(as surveyed April 2018-April 2019 by Triturus Environmental Ltd. (adapted from Macklin et al., 2019)).

Figure 4.5 – Otter records from the National Biodiversity Data Centre in the vicinity of the Proposed Development Site.



(Corresponding record dates are as follows: (a) 02/01/2010; (b) 11/02/2015; (c) 12/02/2016; (d) 06/06/2017; (e) 10/08/2014. All records are of live animal sightings.)

Bats

Three species of bat have been recorded within the 2km grid square associated with the Site (O13G) by the NBDC. Records are listed in Table 4.9.

The NBDC maps landscape suitability for bats based on Lundy et al. (2011). The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. The overall habitat suitability index for bats is classed as

18.33, however the suitability for individual species ranges from 37 for Leisler's Bat *Nyctalus leisleri* to 11 for Daubenton's Bat *Myotis daubentonii*.

Table 4.9 – Records of bats within the 2km (O13G) grid square with the habitat suitability index for each species in the locality

Name	Suitability Index	Date of last record	Database	Legal Status / Designation
Daubenton's Bat <i>Myotis daubentonii</i>	11	05/08/2013	National Bat Database of Ireland	- EU Habitats Directive Annex IV - Wildlife (Amendment) Act, 2000
Leisler's Bat <i>Nyctalus leisleri</i>	37	28/08/2008	National Bat Database of Ireland	- EU Habitats Directive Annex IV - Wildlife (Amendment) Act, 2000
Pipistrelle <i>Pipistrellus pipistrellus sensu lato</i>	31	28/08/2008	National Bat Database of Ireland	- EU Habitats Directive Annex IV - Wildlife (Amendment) Act, 2000

*The records are dated within the last 20 years and are provided by the NBDC.

Birds

There are records for 44 bird species within the O13G grid square associated with the Site. Of these, 23 are green listed, 17 are amber listed and 3 are red listed according to *Birds of Conservation Concern in Ireland 2020-2026* (Gilbert et al., 2021) (Table 4.10). Lesser Redpoll *Carduelis cabaret* was also recorded within the tetrad but is not listed in Gilbert et al. (2021).

Wintering waterfowl such as Light-bellied Brent Geese and Curlew are known to utilise *ex-situ* inner-city grassland feeding grounds during the winter months (i.e., areas outside of an SPA that may provide important foraging or roosting habitat for SCI (special conservation interest) species). To determine whether any known *ex-situ* foraging habitat for SCI species is located within the vicinity of the Proposed Development, reference was made to Enviroguide Consulting (2019) and Benson (2009). These documents provide information on the network of *ex-situ* inland feeding sites utilised by winter birds in Dublin. According to the aforementioned documents, there are no known *ex-situ* feeding sites in close proximity to the Proposed Development. Those closest to the Site include Good Counsel GAA Club (located c. 545m to the south-east), Brickfield Park (located c. 577m to the south-east) and Dolphin's Barn Green (located c. 900m to the south-east). Wintering bird surveys have been carried out at the Site itself also, the results of which are presented in section 4.3.3.4 below.

Table 4.10 – Red and amber listed bird species recorded within grid square O13G.

Species	BoCCI	Date of last record	Title of dataset
Barn Swallow <i>Hirundo rustica</i>	Amber	29/04/2016	Birds of Ireland
Black-headed Gull <i>Larus ridibundus</i>	Amber	31/12/2001	Irish Wetland Birds Survey (I-WeBS) 1994-2001.
Brent Goose <i>Branta bernicla</i>	Amber	06/12/2015	Birds of Ireland
Common Coot <i>Fulica atra</i>	Amber	31/12/2001	Irish Wetland Birds Survey (I-WeBS) 1994-2001.
Common Linnet <i>Carduelis cannabina</i>	Amber	31/12/2011	Bird Atlas 2007 - 2011
Common Starling <i>Sturnus vulgaris</i>	Amber	31/12/2011	Bird Atlas 2007 - 2011
European Greenfinch <i>Carduelis chloris</i>	Amber	31/12/2011	Bird Atlas 2007 - 2011
Goldcrest <i>Regulus regulus</i>	Amber	31/12/2011	Bird Atlas 2007 - 2011
Great Cormorant <i>Phalacrocorax carbo</i>	Amber	31/12/2001	Irish Wetland Birds Survey (I-WeBS) 1994-2001.
Herring Gull <i>Larus argentatus</i>	Amber	20/04/2018	Birds of Ireland
House Martin <i>Delichon urbicum</i>	Amber	31/12/2011	Bird Atlas 2007 - 2011
House Sparrow <i>Passer domesticus</i>	Amber	31/12/2011	Bird Atlas 2007 - 2011

Species	BoCCI	Date of last record	Title of dataset
Lesser Black-backed Gull <i>Larus fuscus</i>	Amber	31/12/2001	Irish Wetland Birds Survey (I-WeBS) 1994-2001.
Mallard <i>Anas platyrhynchos</i>	Amber	20/04/2018	Birds of Ireland
Mew Gull <i>Larus canus</i>	Amber	31/12/2001	Irish Wetland Birds Survey (I-WeBS) 1994-2001.
Mute Swan <i>Cygnus olor</i>	Amber	06/10/2017	Birds of Ireland
Tufted Duck <i>Aythya fuligula</i>	Amber	31/12/2001	Irish Wetland Birds Survey (I-WeBS) 1994-2001.
Common Swift <i>Apus apus</i>	Red	31/12/2011	Bird Atlas 2007 - 2011
Grey Wagtail <i>Motacilla cinerea</i>	Red	15/05/2015	Birds of Ireland
Redwing <i>Turdus iliacus</i>	Red	31/12/2011	Bird Atlas 2007 - 2011

Fish

A fish survey of the River Camac was carried out by Inland Fisheries Ireland (IFI) in 2017. Four age classes of Brown Trout *Salmo trutta* were recorded in the river, with 0+ individuals the most abundant cohort (Matson et al., 2018). Of all the fish species captured in the Camac, Brown Trout was the most abundant. Four sites were assigned a fish ecological status of moderate and one site was assigned poor status (Matson, 2018). Furthermore, a single Brown Trout was captured during a transitional water survey carried out by IFI in the Upper Liffey Estuary in 2010 (Kelly et al. 2010).

IFI surveys of the River Camac in 2017 (noted above) identified Lamprey species in one of the five sites surveyed (Matson et al., 2018). The 2009 and 2014 surveys of the River Liffey (noted above) identified Lamprey species in both years (Kelly et al., 2015). Furthermore, River Lamprey were captured during a transitional water survey carried out by IFI in the Upper Liffey Estuary in 2010 (Kelly et al., 2010).

There are NBDC records of European Eel *Anguilla anguilla* within grid square O13G (2km). Furthermore, Eel were captured during IFI fish surveys of the Camac River in 2011 (Kelly et al., 2012). Eels were also captured in a transitional water survey carried out by IFI in the Upper Liffey Estuary in 2010 (Kelly et al., 2010) and both the Upper and Lower Liffey Estuary in 2008 (Central and Regional Fisheries Boards, 2008).

Amphibians and Reptiles

No amphibian or reptile species were recorded within the 2km grid square.

Invertebrates

No invertebrate species listed under the Habitats Directive were recorded within the 2km grid squared by the NBDC. Two invertebrates listed as “endangered” or “vulnerable” were recorded within the 2km grid square, namely Glutinous Snail *Myxas glutinosa* and Lake Orb Mussel *Musculium lacustre*. In addition, the Environmental Protection Agency (EPA) EPA River Biologists database indicates the presence of white-clawed crayfish *Austropotamobius pallipes* in the Camac river in 2007 and 2013.

Table 4.11 – Threatened invertebrate species listed as 'vulnerable' or 'endangered' within the 2km (O13G) grid square. The records are dated within the last 20 years and are provided by the NBDC.

Name	Group	Date of last record	Database	Legal Status / Designation
Glutinous Snail <i>Myxas glutinosa</i>	Mollusc	05/10/2003	All Ireland Non-Marine Molluscan Database	- Endangered
Lake Orb Mussel <i>Musculium lacustre</i>	Mollusc	05/10/2003	All Ireland Non-Marine Molluscan Database	- Vulnerable

4.3.2 Stakeholder Consultation

Scoping letters were sent to Prescribed Authorities as part of this EIAR. Of relevance to this Biodiversity Chapter is the response received by Inland Fisheries Ireland (IFI) (dated the 6th May 2022). In their response, IFI highlighted the River Camac and Grand Canal as being in close proximity to the Proposed Development Site. IFI noted that “*the Camac is a recognised salmonid system, under significant ecological pressure predominately due to urbanisation. Although considerable sections of main channel are culverted, sections that remain on the surface invariably support self-sustaining populations of Brown trout (Salmo trutta). The river also supports populations of migratory Sea trout (Salmo trutta) in the lower reaches. Other species include the protected European eel, Freshwater Crayfish (Austropotamobius pallipes) and Lamprey (Lampetra sp.) species, listed under Annex II of the EU Habitats Directive.*” In their response, IFI also noted that “*There should be nothing other than clean water entering the surface water sewer system which may discharge to the Camac or canal during the construction or operational phase. Mitigation measures to protect the aquatic environment should be solely designed and implemented within the proposed development to ensure there is no negative impact within any of the receiving environments.*” The various elements of the Construction Phase that have the potential to negatively impact watercourses are also highlighted in their response (e.g., ground preparation and associated construction works). The use of nature-based solutions to manage surface water attenuation post construction phase is encouraged in the response.

4.3.3 Site Survey

4.3.3.1 Habitats and Flora

The northern section of the Site is primarily comprised of buildings and artificial surfaces (BL3). As noted earlier in this chapter, there are proposed upgrade works to the water supply along Emmet Road to the junction of Grattan Crescent/Tyrconnell Road which crosses the River Camac. The habitat along this stretch of Emmet Road is comprised entirely of buildings and artificial surfaces. An area of recolonising bare ground dominated by Butterfly Bush *Buddleja davidii* occurs within the north-western corner of the Site. There is a small area of flower bed and borders (BC4) dominated by ornamental grasses at the north-eastern corner of the Site. A strip of dry meadows and grassy verges habitat (GS2) occurs along the north and southern boundaries of the Site. The meadow habitat at the north of the Site may have been seeded, and contains species such as poppy *Papaver* sp., creeping cinquefoil *Potentilla reptans*, yarrow *Achillea millefolium*, knapweed *Centaurea nigra*, bird’s-foot trefoil *Lotus corniculatus*, creeping buttercup *Ranunculus repens*, cat’s-ear *Hypochaeris radicata*, cock’s-foot *Dactylis glomerata* and false oat-grass *Arrhenatherum elatius*. The meadow habitat at the south of the Site contains species such as bush vetch *Vicia sepium*, rosebay willowherb *Chamaenerion angustifolium*, silverweed *Potentilla anserina*, creeping buttercup, creeping thistle *Cirsium arvense*, red valerian *Centranthus ruber*, dandelion *Taraxacum vulgaria* and nettles *Urtica dioica*. A small section of GS2 also occurs between buildings to the north of the Site. Species recorded here included dandelion, yarrow, creeping buttercup, cat’s-ear, Yorkshire fog *Holcus lanatus*, cock’s-foot and false oat-grass. A stone and mortar wall (BL1) associated with Goldenbridge Cemetery is located to the south of the Site. Red valerian and ivy *Hedera helix* were recorded growing on this wall (Figure 4.7). Stone and mortar walls were also recorded towards the north of the Site.

A large area of Improved Amenity Grassland (GA2) occurs to the south of the Site and constitutes roughly two thirds of the entire Site area. This grassland is subject to regular mowing. Species recorded here included dandelion, yarrow, creeping buttercup, cat’s-ear, perennial rye grass *Lolium perenne*, Yorkshire fog, white clover *Trifolium repens*, red clover *Trifolium pratense*, daisy *Bellis perennis*, ragwort *Jacobaea vulgaris*, ribwort plantain *Plantago lanceolata* and dock *Rumex* sp. Small numbers of young deciduous trees are planted along the eastern and western sections of this grassy area. No rare or protected flora were recorded on Site.

Figure 4.6 – Large Area of improved amenity grassland at the Site. Image taken 20.06.2022.



Figure 4.7 – Stone wall and other stonework (BL1) habitat at the south of the Site



(with dry meadows and grassy verges (GS2) habitat adjacent to the wall. Image taken 20.06.2022.)

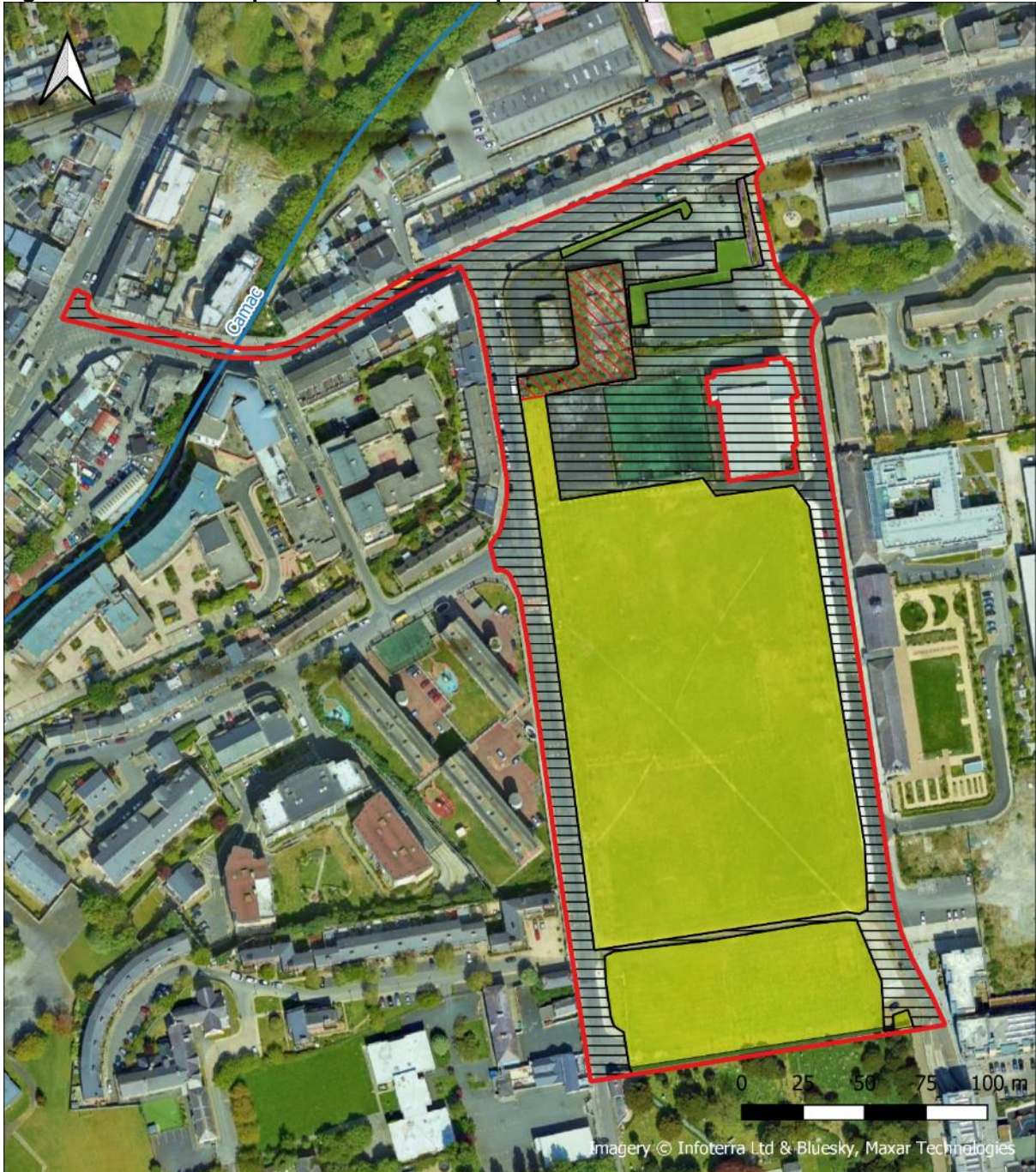
4.3.3.2 Invasive Flora

Three invasive plant species were recorded at the Site of the Proposed Development during the surveys carried out in 2020, 2021 and 2022, namely Butterfly Bush *Buddleja davidii*, Montbretia *Crocsmia x crocosmiiflora* and Sycamore *Acer pseudoplatanus*. No species listed on Schedule III of the *European Communities (Birds and Natural Habitats) Regulations 2011* (SI 477 of 2011, as amended) were recorded at the Site. Butterfly Bush was abundant throughout the Site, the largest stand was recorded growing within the recolonising bare ground habitat, however, plants were also recorded growing within walls and other areas of hardstanding within the Site.

Figure 4.8 – Butterfly Bush at the Site of the Proposed Development. Image taken 18.05.2021.



Figure 4.9 – Habitat map of the Site of the Proposed Development.



Legend: Site Boundary Habitats Amenity Grassland (Improved) Buildings and Artificial Surfaces Flower Beds and Borders Recolonising Bare Ground Dry Meadows and Grassy Verges Stone walls and Other Stonework River Network Routes 		Project: Emmet Road Development Client: Dublin City Council Title: Habitat Map		 3D Core C, Block 72, The Plaza Park View, Dublin 17 D17 299H www.enviroguide.ie info@enviroguide.ie +353 (0)1 568 4730 Drawn By: SA Checked: LG Date: 21/09/2022 Projection: IRENET95 / Irish Transverse Mercator Scale @ A4: 1:2001 Notes: Site boundaries shown are for illustration purposes only and do not represent legal or exact boundaries	
---	--	--	--	--	--

4.3.3.3 Mammals

Mammals (excluding bats)

No evidence of the presence of fox *Vulpes vulpes* (relatively common in urban areas) was noted at the Site during the field survey carried out on the 9th July 2020 or 20th June 2022. However, a single fox was recorded at the Site during the additional invasive species survey carried out on the 18th May 2021. The Site is deemed unlikely to attract species such as Hedgehogs or Pygmy Shrews due to the lack of woodland/hedgerow habitat present.

Bats

July 2020 and July 2022 (Ash Ecology and Environmental Ltd)

Bat Recordings

The following is extracted from the Bat Survey Report by AEE Ltd.

In total three species of bat were detected overall during the three surveys in July 2020 and 2022. The tabulated results are summarised in Table 4.12, with the complete dataset of bat species identified in real time in the field using the Elekon Batlogger M detector presented in Appendix B of the Bat Report (Appendix F of Volume III of the EIAR).

A merged map of the three surveys, outlining the locations of the bat calls, is shown in Figure 4.11

There are three main structures which were surveyed (Labelled 1, 2 and 3 as per Figure 4.10). Building 1 and 2 will be subject to demolition and Building 3 (Inchicore Community Sports Centre) will be retained and unaffected (and is outside the project site area).

The interior of the affected Building 2 and 3 were inspected as per the methodology set out in Section 2.3 of the Bat Report. All spaces that could potentially allow bats access into Building 1, 2 and 3 were visually examined in detail for bats, signs of bats, or evidence of bat activity, using a torch where necessary. Cracks, crevices etc. were investigated for ingress / egress points and evidence of bat habitation, such as prey items, smearing lines, droppings, and staining.

Overall, the buildings numbered 1 and 2 were assessed as having 'Low' bat suitability with limited access points observed. Both buildings 1 and 2 are currently vacant. Building 3 (Inchicore Community Sports Centre) is currently in use and a modern well sealed building with 'Negligible' bat roost potential. This building will not be affected by works/development.

Building 1 and 2 had some bat potential e.g., heavy ivy on walls, entry points via old vent holes, wooden soffits (Building 1) however given the high levels of city street lighting and limited foraging and commuting habitat, together with no bat emergence on the nights of surveys, it is unlikely bats are using these buildings. In addition, the interior of Building 2 revealed no signs of bats.

It was noted Goldenbridge Cemetery (outside the site but adjacent to the south boundary) has mature trees with potential roost features (PRFs) and so is considered to be 'Low' to 'Moderate', however is mainly an ecological island in the city setting. Bat activity was low on all survey nights carried out in both July 2020 and July 2022, despite optimal weather conditions. The activity survey in July 2022 focused mainly on the eastern area of the site where the buildings are located (for health and safety reasons as advised by DCC personnel).

In conclusion the subject site had low levels of bat activity despite optimal weather while the cemetery had low to moderate levels with the majority in the southeast corner of the Goldenbridge Cemetery which is not within the development site.

Table 4.12 – Bat Results Summary Data from three Survey Dates – July 23rd 2020, July 25th 2020 and July 7th 2022

Species Name - Common	Species Name - Latin	Number of Occurrences	Peak Frequency (kHz)
23/07/2020 - Site			
Leisler’s Bat	<i>Nyctalus leisleri</i>	2	27
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	1	56
07/07/2022 - Site			
Leisler’s Bat	<i>Nyctalus leisleri</i>	4	27
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	1	56
25/07/2021 – Goldenbridge Cemetery			
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	3	46
Leisler’s Bat	<i>Nyctalus leisleri</i>	2	27
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	7	56

Figure 4.10 – Bat activity map



(at the Site and Goldenbridge Cemetery on July 23rd 2020, July 25th 2020 and July 7th 2022. Map is extracted from the bat survey report (AEE Ltd, July 2022).

Bat Potential Tree Assessment

Trees affected by the development are semi-mature. There are no mature trees present. All semi mature trees and areas of scrub were assessed as having negligible bat roost potential due to a lack of features such as heavy ivy, holes, crevices, bark splits and peeling bark. It is therefore concluded that all trees onsite are assessed as having ‘Negligible’ bat roost potential and ‘No Risk’ for affecting bat roosts.

Landscape Evaluation

The landscape is considered of local importance (lower value) for bats at the Proposed Development Site and of local importance (higher value) at the Goldenbridge Cemetery due to tree cover in this location and the network of mature treelines along with the Grand Canal giving a continuous treeline foraging route albeit with lighting which will

discourage certain species which might account for the low level of bat activity. In that regard the trees and vegetation in and around the Site are important as a biodiversity corridor to the wider landscape outside the cityscape.

September 2021 (Enviroguide Consulting)

A total of 3 bat species (Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Leisler's Bat (*Nyctalus leisleri*)) were recorded within the Site of the Proposed Development during a bat activity survey in September 2021. Soprano Pipistrelle was the most common species recorded followed by Common Pipistrelle and Leisler's Bat (Table 4.13). Bat activity was confined to the northern portion of the Site with the majority of activity occurring adjacent to buildings 1 and 2 and area of butterfly bush scrub habitat. Buildings 1 and 2 are considered to have low bat roost suitability due to the lack of surface features (cracks/crevices and openings within the building envelope).

During the night of the survey foraging activity was noted over the area of butterfly bush scrub adjacent to buildings 1 and 2 where bats were seen traversing and circling this habitat. Several "feeding buzzes" (rapid calls emitted before capturing prey) were also noted during the analysis of the bat detector data. The majority of these feeding buzzes were emitted from Soprano Pipistrelle and Common Pipistrelle bats. This suggests that the majority of activity in the northern portion of the Site was due to foraging around the butterfly bush scrub. This habitat likely offers some degree of foraging potential within the context of the Site itself.

No activity was recorded across the green space that makes up the majority of the Site to the south. This is likely due to the lack of trees or shrubs which provide commuting and foraging habitat for bats. Similarly, no bats were recorded along the margins of the Site with the exception of 1 no. Soprano Pipistrelle recorded along the northern boundary adjacent to Emmet Road at 20:42pm. Public lighting along the margins of the Site was noted to be high with no suitable foraging/commuting habitat present.

Table 4.13 – Summary of Bat activity recorded at the Site on 14th September 2021.

Species	Number of Recordings	Number of Calls
Common Pipistrelle (<i>Pipistrellus pipistrellus</i>)	24	838
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	66	2363
Leisler's Bat (<i>Nyctalus leisleri</i>)	2	16

Figure 4.11 – Bat activity map at the Site on 14/09/2021



Legend: Site Boundary Route Walked Species Records Nyctalus leisleri Pipistrellus pipistrellus Pipistrellus pygmaeus	Project: Emmet Road Development		
	Client: Dublin City Council		
	Title: Site Location	Notes: Site boundaries shown are for illustrative purposes only and do not represent legal or exact boundaries.	

4.3.3.4 Birds

Breeding Bird Surveys

A thorough survey for nesting birds was carried out during the breeding bird survey undertaken on the 9th July 2020, 20th May 2021 and 20th June 2022. No evidence of nesting by any species was found. House Sparrows were present in the area of Butterfly Bush *Buddleja davidii* during the survey carried out in July 2020, but no nests were recorded. No breeding birds or nests were recorded within the Butterfly Bush scrub habitat surveyed prior to vegetation clearance in May 2021.

Three bird species listed on the Birds of Conservation Concern in Ireland 2014–2019 Amber List and one bird species listed on the Red List were recorded at the Site in July 2020 and June 2022. However, none of these were recorded breeding.

Table 4.14 – Bird species recorded at the Site of the Proposed Development

Species	July 2020	June 2022	Status on Site	Comments	Status
House Sparrow <i>Passer domesticus</i>	Present	Not present	Non-breeding	Present in the Butterfly Bush in the north-west section but no nests were recorded.	Amber
Pied Wagtail <i>Motacilla alba</i>	Present	Not present	Non-breeding	A single bird was recorded foraging for food around the Community Centre area, but no nesting activity noted.	Green
Woodpigeon <i>Columba palumbus</i>	Present	Present	Non-breeding	Three birds feeding on the large green area in the southern section in July 2020. Birds heard in June 2022.	Green
Jackdaw <i>Corvus monedula</i>	Present	Present	Non-breeding	Up to ten present on the large green area in the southern section in July 2020. Numerous birds, including fledglings, present on the large green area in the southern section in June 2022.	Green
Hooded Crow <i>Corvus cornix</i>	Not present	Present	Non-breeding	Numerous birds present on the large green area in the southern section of the Site in June 2022.	Green
Rook <i>Corvus frugilegus</i>	Not present	Present	Non-breeding	One individual perched on a lamp-post.	Green
Collared Dove <i>Streptopelia decaocto</i>	Not present	Present	Non-breeding	One individual recorded flying over the Site	Green
Lesser Black-backed Gull <i>Larus fuscus</i>	Present	Not present	Non-breeding	Present on buildings opposite site along St. Vincent Street West.	Amber
Herring Gull <i>Larus argentatus</i>	Present	Present	Non-breeding	Present on buildings opposite site along St. Vincent Street West in July 2020. Present on amenity grassland, on buildings opposite site along St. Vincent Street West and buildings within the Site in June 2022.	Amber

(Note: on the 9th July 2020 and 20th June 2022. Status' are based on Gilbert et al., (2021).

Winter Bird Surveys

The winter bird surveys are summarised here. Refer to the report in Appendix F of Volume III of the EIA for full details.

2020/21 Survey Results

Five waterfowl/shorebird species were recorded utilising the Site lands. Light-bellied Brent Geese (*Branta bernicla hrota*) were recorded feeding on the Site on just one occasion in 2020/21 (peak count 14). Light-bellied Brent Goose

droppings, a distinctive indicator of this species' presence/usage of a site, were also recorded on just one occasion; during the same winter.

The only other shorebirds recorded utilising the Site were Gull species such as Herring Gull, Common Gull and Black-headed Gull which were recorded loafing on the Site. Lesser black-backed Gull (*Larus fuscus*) was recorded during the March surveys.

2021/22 Survey Results

Eight waterfowl/shorebird species were recorded in the vicinity of the Site lands. Four of these species were only recorded as flying over the site rather than using the Site as a feeding ground. Light-bellied Brent Geese were recorded once flying over the Site. Light-bellied Brent Goose droppings were not recorded on any of the site visits, despite thorough site walkovers carried out each survey day.

The only shorebirds recorded utilising the Site were all Gull species with Herring Gull, Common Gull and Black-headed Gull loafing about on the Site. Lesser black-backed Gull was recorded on the March surveys.

Four instances of waterfowl/shorebird species in flight over the Site were recorded.

Records of interest are highlighted below:

- 24/01/2022 – 230 no. Light-bellied Brent Geese flew south-east over the Site.
- 21/03/2022 – A Mute Swan flew west over the Site.
- 21/03/2022 – An Oystercatcher flew east over the Site.
- 21/03/2022 – 9 Mallard (*Anas platyrhynchos*) flew east over the Site

Herring Gull, Common Gull, Lesser black-backed Gulls and Black-headed Gull were the most common shorebird species observed loafing on the Site lands along with other common passerine species such as corvids, wood pigeons, and smaller hedgerow species.

4.3.4 Overall Evaluation of the Context, Character, Significance and Sensitivity of the Proposed Development Site

Fauna that have the potential to utilise areas within the immediate area of the Proposed Development, or for which records exist in the wider area, have been evaluated below in Table 4.15 for their conservation importance. In addition, designated sites and habitats have been evaluated. This evaluation follows the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009). The rationale behind these evaluations is also provided. The term 'ecological receptors' is used when impacts upon them are likely.

The potential impact of the Proposed Development on European Sites is addressed in the AA screening report accompanying this application, prepared by Enviroguide.

The AA screening report concluded;

“The Proposed Mixed-use Development at Emmet Road, Dublin 8 has been assessed taking into account:

- *the nature, size and location of the proposed works and possible impacts arising from the construction works.*
- *the qualifying interests and conservation objectives of the European Sites*
- *the potential for in-combination effects arising from other plans and projects.*

*In conclusion, upon the examination, analysis and evaluation of the relevant information and applying the precautionary principle, it is concluded by the authors of this report that, on the basis of objective information; the possibility **may be excluded** that the Proposed Development will have a significant effect on any of the European Sites listed below:*

*South Dublin Bay SAC (000210)
North Dublin Bay SAC (000206)
Baldoyle Bay SAC (000199)
Wicklow Mountains SAC (002122)*

Glenasmole Valley SAC (001209)
Rye Water Valley/Cartron SAC (001398)
Rockabill to Dalkey Island SAC (003000)
South Dublin Bay and River Tolka Estuary SPA (004024)
North Bull Island SPA (004006)
Baldoyle Bay SPA (004016)
Wicklow Mountains SPA (004040)

*In carrying out this AA screening, mitigation measures **have not been taken into account**. Standard best practice construction measures which could have the effect of mitigating any effects on any European Sites have similarly not been taken into account.*

*On the basis of this screening exercise, it can be concluded, based on the best scientific knowledge available, that the possibility of any significant effects on any European Sites, whether arising from the project itself or in combination with other plans and projects, **can be excluded**. Thus, there is no requirement to proceed to Stage 2 of the Appropriate Assessment process; and the preparation of a Natura Impact Statement (NIS) is not required”.*

As such, European Sites are not considered further in this Biodiversity Chapter.

Table 4.15 – Evaluation of designated sites, habitats and fauna recorded within the surrounding area.

Designated Sites/Species/Habitats		Evaluation	Key Ecological Receptor (KER)	Rationale
Designated Sites	SACs & SPAs	International Importance	No	There is a hydrological connection between the Site and European Sites in Dublin Bay via the local drainage network, however, significant effects on European sites were ruled out in AA Screening report
	pNHAs	National Importance	Yes	There is a hydrological connection between the Site and pNHAs in Dublin Bay via the local drainage network.
	Dublin Bay Biosphere and Ramsar Sites	International Importance	Yes	There is a hydrological connection between the Site and Dublin Bay via the local drainage network.
Habitats	Buildings and artificial surfaces (BL3)	Local importance (lower value)	No	Man-made habitat of low biodiversity value.
	Stone walls and other stonework (BL1)	Local importance (lower value)	No	Man-made habitat of limited biodiversity value.
	Amenity grassland (GA2)	Local importance (lower value)	No	Low diversity highly managed grassland not considered to be of conservation value.
	Dry meadows and grassy verges (GS2)	Local importance (lower value)	No	Small area of habitat, may provide some foraging for pollinators.
	Recolonising bare ground (ED3)	Local importance (lower value)	No	Made ground which has been colonized by non-native shrubs, of low biodiversity value.
	Flower Beds and Borders (BC4)	Local importance (lower value)	No	Man-made habitat of low biodiversity value.
	River Camac	County Importance	Yes	Hydrological connection to the river via the local drainage network
Mammals	European Otter <i>Lutra lutra</i>	Local Importance (Higher Value)	Yes	There is a hydrological connection between the Site and the Camac River via the local drainage network.
	Red Fox <i>Vulpes Vulpes</i>	Local Importance (lower value)	No	Although this species may frequent the Site, it is not considered to be of conservation concern and therefore is not assessed further in this report.
	Wood mouse <i>Apodemus sylvaticus</i>	Local Importance (lower value)	No	This species is not considered to be of conservation concern and therefore is not assessed further in this report
	Bat Assemblage	Local Importance (higher value)	Yes	Several bat species were detected at the Site of the Proposed Development during dedicated surveys.
Birds	Bird assemblage	Local Importance (higher value)	Yes	Wintering waterbirds recorded utilising the Site (albeit in low numbers). The buildings on site may provide suitable nesting habitats for swallows and swifts.
Fish	Atlantic salmon; Brown trout; Sea Trout; European Eel; <i>Lampetra</i> spp.	Local Importance (higher value)	Yes	There is a hydrological connection between the Site and the River Camac and the Liffey Estuary via the local drainage network.

Designated Sites/Species/Habitats		Evaluation	Key Ecological Receptor (KER)	Rationale
Invertebrates	White-clawed crayfish <i>Austropotamobius pallipes</i>	Local Importance (higher value)	Yes	There is a hydrological connection between the Site and the River Camac via the local drainage network.

4.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

4.4.1 Location

The Site of the Proposed Development is located in the Inchicore/Goldenbridge area of Dublin city, and is bounded to the north by Emmet Road, to the south by Goldenbridge Cemetery, to the east by the former Richmond Barracks and the pedestrian link to the Bulfin estate next to Saint Michael's Church; and to the west by Saint Vincent Street West.

4.4.2 Description of the Proposed Development

The development will comprise 578 no. apartments, consisting of 110 no. studio apartments, 172 no. 1 bedroom apartments, 250 no. 2 bedroom apartments (including 17 no. duplex apartments) and 46 no. 3 bedroom apartments (all apartments/duplexes to have balconies or terraces), community hub/library, creche, supermarket, 5 no. retail/café/restaurant/class 2 financial services units & 2 no. café/restaurant units), a public plaza fronting onto Emmet Road and the installation of a new watermain c 200m in length along Emmet Road to the junction with Tyrconnell Road/Grattan Crescent. The proposal includes works to a protected structure (8705 - Richmond/Keogh Barracks, relating to works to rubble stone boundary wall). The proposed development will consist of and includes:

- A) In the southern portion of the site ('*Main Residential Area 01*' - *Block A*), comprises a courtyard perimeter building (306 no. apartments consisting of 76 no. studio apartments, 100 no. 1 bedroom apartments, 104 no. 2 bedroom apartments and 26 no. 3 bedroom apartments as well as a management office c. 59 sq. m) in a series of blocks as follows: Block A1 - 5 storeys (35 no. apartments), Block A2 - 7 storeys (55 no. apartments), Block A3 - 5 storeys (39 no. apartments), Block A4 – 5 storeys (20 no. apartments), Block A5 – 7 storeys (54 no. apartments), Block A6 – 5 storeys (37 no. apartments with café/restaurant at ground floor c. 80 sq. m), Block A7 – 7 storeys (54 no. apartments), and Block A8 – 3 storeys, (6 no. apartments/ 6 no. duplex units);
- B) In the central portion of the site ('*Main Residential Area 02*' - *Block B*), comprises a courtyard perimeter building (181 no. apartments consisting of 24 no. studio apartments, 43 no. 1 bedroom apartments, 103 no. 2 bedroom apartments and 11 no. 3 bedroom apartments) in a series of blocks as follows:
Block B1 – 5 storeys over partial below ground partial basement level (33 no. apartments) with an adjacent 2 storey creche of c. 816 sq. m with associated play areas, Block B2 – 7 storeys (54 no. apartments), Block B3 – 3 storeys (4 no. apartments/4 no. duplex units), Block B4 – 5 storeys (38 no. apartments), Block B5 – 7 storeys (48 no. apartments), including 2 no. duplex units fronting onto internal street, as well as provision of energy centre with associated plant/switch rooms and water storage/plant space (at partial below ground/basement level);
- C) In the northern portion of the site – the provision of a commercial mixed use Block C (5 storeys with 7 storey element) consisting of 91 no. apartments (10 no. studio apartments, 29 no. 1 bedroom apartments, 43 no. 2 bedroom apartments & 9 no. 3 bedroom apartments – including 5 no. duplex apartments fronting onto internal street), communal open space at third floor level, supermarket (including off-licence) of c. 2,476 sq. m GFA (c. 1,765 sq. m net retail sales area) at first floor level, with ground floor café/restaurant (c. 205 sq. m), 5 no. units (retail/café/restaurant/class 2 financial services floorspace c. 564 sq. m – to be amalgamated/subdivided as required);
- D) In the northern portion of the site the provision of a community hub/library of c. 2,810 sq. m (4 no. storeys) with flexible internal meeting rooms/spaces including internal double height halls as well as roof garden/terrace areas at second and third floor (roof levels);
- E) A new Vehicular access (as well as new adjacent service access) will be provided from St. Vincent's Street West into the undercroft level of Block C (with 3 no. internal streets provided between St. Vincent's Street West and "Patriot's Path" and Thornton Heights along boundary with Goldenbridge cemetery). The proposal also provides 106 no. car parking spaces, 8 no. motorcycle spaces as well as 1,285 no. cycle spaces within the blocks and single storey external covered store as well as surface spaces. (At undercroft level of Block C, the development includes 54 no. car parking spaces, 5 no. motorcycle spaces and 104 no. cycle spaces);
- F) Provision of 3 no. main areas of public open space and a "*sports zone*" area adjacent to the existing Inchicore Sports Community Centre c. 0.72 hectares as well as communal open space for the residents within the blocks;

- G) The proposal includes works, and alterations (including reduction in height, removal of sections, and provision of new openings) into the existing rubble stone wall (a protected structure no. 8705);
- H) The development includes water main upgrade along the Emmet Road from the subject site for c. 200m to the junction with Tyrconnell Road/Grattan Crescent and tie in works surrounding the site;
- I) The development will also provide for all associated works and infrastructure to facilitate the development, including accommodation works, site clearance, hard and soft landscaping (to tie into existing streets), ESB substations, bin storage, green roofs, solar panels, heat pump systems (at roof level), play equipment, attenuation areas and connection to foul and surface water drainage and water supply, and construction access will be from St. Vincent’s Street West and Patriot’s Path as required.

4.4.3 Part 8 Development (Planning Application Ref 2221/21)

Permission was granted on the 9th April 2021 for demolition/site clearance activities within the Proposed Development Site boundary. Specifically, demolition of the former Health Centre and St. Michael’s Community Centre and associated site clearance works which include the remains of a disused halting site together with internal site walls, fences, hard surfaces and utilities has been granted. No new construction works are proposed as part of this Part 8 Development, other than those necessary to secure the site or divert services. The foundations of the buildings will be removed, and all services will be removed insofar as this is practicable. Figure 4.12 shows the site location with buildings proposed for demolition in green.

Figure 4.12 – Proposed Development location showing buildings to be demolished



as per separate Part 8 Application (hatched green areas). Extracted from drawing no. 0318-S-A1-00 Bucholz McEvoy Architects (2022).

4.4.4 Landscape Plan

The landscape masterplan for the Proposed Development includes provisions for outdoor leisure infrastructure such as children’s play areas, allotments, dining areas and public seating. The main ecological component of the landscape plan comprises of tree, shrub and ground cover planting. The planting is composed of a mixture of native and ornamental species and includes planting 5 .No landmark trees (Sessile Oak, *Quercus petrea*), 62.No street trees (Honey Locust, *Gleditsia tricanthos*), 32.No feature trees (Sweetgum, *Liquidamber styraciflua*) and 40 No domestic fruit trees (apple, plum and pear). Shrub planting will include 30.No feature shrubs (Silver Birch, *Betula pendula*) and 125 No. street shrubs (*Amelanchier spp.*).

Ground planting on-site will comprise of distinct planting mixtures (A-D) which will be planted at various locations across the Site. The mixtures will include buffer planting, SuDS planting, biodiversity planting and street underplanting See landscape draws and planting schedule for full details.

4.4.5 Public Lighting

The public lighting plan for the Proposed Development has been prepared by IN2 (2022). The external lighting for the Proposed Development has been designed to achieve the performance requirements as set out in the following standards:

- DCC - Public Lighting Installations in Residential and Industrial Areas
- BS 5489-1:2013 Code of Practice for the Design of Road Lighting
- BS EN 13201-2:2015 – Road Lighting Part 2: Performance Requirements
- BS 8300:2018 - Design of an accessible and inclusive built environment
- Institution of Lighting Professionals – Guidance Notes for the Reduction of Obtrusive Light GN01:2011
- CIBSE – Lighting Guide 6: The Exterior Environment
- NSAI National Rules for Electrical Installations I.S 10101: 2020
- Bats and Lighting – Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland, 2010)
- Bats and Lighting in the UK – Bats and the Built Environment Series (Institute of Lighting Professionals, September 2018).

As noted by IN2 (2022), the Site lighting design has been assessed to establish minimal environmental and ecological impact through glare, sky glow and obtrusive light (light spill) and will adhere to the following characteristics:

- The minimum level of appropriate/required lighting level will be provided within the developed/residential areas.
- Light standards will be fitted with low intensity, horizontal cut-off LED light fittings employing a narrow directional light or cowed light. This will avoid the effect of light spill arising.
- The lighting includes dimming by 30% post curfew hours.
- Light standards and associated lighting will be directed away from areas of open space.
- No floodlighting will be used in the development.
- The avoidance of direct lighting of proposed areas of habitat creation/landscape planting, or on trees planted.
- Goldenbridge Cemetery will not have an increase in the current lux level due to the adjacent development.
- Unnecessary light spill controlled through a combination of directional lighting and hooded/ shielded luminaires or strategic planting to provide screening vegetation.
- The colour rendering of the selected light fitting will be 3000k making the LED fittings a warmer light, helping to further minimise the impact on the local wildlife
- Where lighting is necessary, it shall be of limited height and targeted downwards to prevent overspill.
- Bat boxes will not be illuminated.

4.4.6 Sustainable Urban Drainage Systems

As documented in the Engineering Services Report (O’ Connor Sutton Cronin (OCSC), 2022), the surface water drainage for the Proposed Development Site has been divided into three (3No.) catchment areas as described below.

- Catchment A – Road and paving alongside Goldenbridge Cemetery;
- Catchment B – Two (2No.) residential blocks and associated paving / landscaping; and
- Catchment C – Commercial area, and associated paving / landscaping.

Each catchment is to be separated into smaller sub-catchments, to best manage the rainfall runoff and provide treatment and attenuation at source, wherever practicable. Each catchment will also have its own independent outfall to the public surface water infrastructure, along St. Michael's Estate, which will each discharge treated flows that are attenuated to greenfield equivalent rates. The new development's surface water drainage network will comprise a sustainable drainage system that is heavily integrated with the landscape features, wherever practicable. The sustainable drainage systems reduce the runoff volume discharging from site, as well as improving the water quality. (OCSC, 2022). Proposed SuDS measures include; green roofs, bioretention systems/rain gardens, tree pits, pervious paving, filter drains, trapped road gullies, underground pipe network, silt traps, geocellular storage systems and flow control devices.

Attenuated and treated surface water from Catchment A, Catchment B and Catchment C will outfall to the existing public surface water infrastructure and will ultimately discharge to the Camac River (OCSC, 2022).

4.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

The following sections provide an assessment of the impact of the Proposed Development on key ecological receptors. As per CIEEM (2018), where mitigation is fully integrated into the scheme and there is high confidence that it will be implemented the significance of effects of the mitigated project are assessed. Where mitigation has not been integrated into the scheme, for example where it is necessary to include specific measures within a Construction Environmental Management Plan, the potential impacts are assessed in the absence of mitigation. The following is extracted from CIEEM (2018): "*Presenting the results of the assessment 'with' and 'without' mitigation allows the need for mitigation and/or compensation to be clearly identified. Where mitigation is fully integrated into the scheme and there is high confidence that it will be implemented, it may be appropriate simply to assess the significance of effects of the mitigated project, with this assessment reflecting the likelihood of the incorporated measures being successful. Where there is any uncertainty, then the with/without mitigation approach to assessment described above should be used to ensure transparency*". In this instance, mitigation/enhancement has been integrated into the surface water drainage of the Site (via SUDS), lighting plan and landscape plan. As such, the impact of these plans is assessed in combination with other relevant impacts.

4.5.1 Construction Phase

4.5.1.1 Designated Sites and the River Camac

Significant effects on European Sites have been ruled out in the AA screening accompanying this application (see section 4.3.4).

There are a number of proposed Natural Heritage Areas within the zone of influence of the Proposed Development (Table 4.6, Figure 4.3). The closest proposed Natural Heritage Area is the Grand Canal pNHA. The Grand Canal is a man-made waterway linking the River Liffey at Dublin with the Shannon at Shannon Harbour and the Barrow at Athy. A number of different habitats are found within the canal boundaries - hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland. In contrast to the River Liffey and River Camac, the Grand Canal supports coarse fish species including pike, rudd, bream and tench. The canal is also important for supporting opposite-leaved pondweed *Groenlandia densa* (Flora Protection Order 1987), and glutinous snail *Myxas glutinosa* (Dublin City Biodiversity Action Plan 2015-2020). The latter is a very rare freshwater snail, which requires pollution-free, extremely clear, calm, and calcium-rich water. However, the ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species (NPWS, 2009a). Given the distance and vegetated buffer between the Grand Canal pNHA and the Project Site, and that the Site drains towards the River Camac as opposed to the Grand Canal (see section 4.3.1.3 above), it is deemed that there is no potential for effects on the Grand Canal pNHA as a result of the Proposed Development.

Several pNHAs are hydrologically and hydrogeologically linked to the Site via the existing surface water drainage network and the underlying bedrock aquifer. These include Dolphins Dublin Docks pNHA, North Dublin Bay pNHA, South Dublin Bay pNHA and Booterstown Marsh pNHA. Dolphins Dublin Docks pNHA is comprised of two mooring 'dolphins' in the River Liffey near Pigeon House Harbour. These 'dolphins' are used by nesting terns with approximately 350 pairs of Common tern recorded in 2006 (Dublin City Biodiversity Action Plan, 2008 – 2012). North Dublin Bay pNHA is designated for the same features for which the North Dublin Bay SAC and North Bull Island SPA have been - intertidal/coastal habitats and SCI bird species. South Dublin Bay pNHA is designated for the same features for which the South Dublin Bay SAC have been (Dublin City Biodiversity Action Plan, 2008 – 2012). Booterstown Marsh pNHA is a site of local/regional ornithological importance. Of particular interest are the high

concentrations of Snipe which occur in winter - numbers up to 100 are normal, but as many as 400 (Jan. 1988) have been recorded. The marsh is also used as a high-tide roost by a variety of waders and gulls. Up to 50 Mallard and 40 Teal are regularly seen in autumn and winter. Other species which frequent the marsh include Kingfisher (1-2 birds), an Annex I species under the E.U. Birds Directive, and Grey Heron (5-8 birds). Rarer birds of coastal marshes have been recorded, notably Little Egret and Yellow Wagtail. Booterstown Marsh is the only saltmarsh in south Dublin and, despite some concerns about the increasing salinity of the site, it remains a valuable habitat for many birds as well as containing a diverse flora including the protected plant Borrer's Saltmarsh grass *Puccinellia fasciculata* (NPWS, 2009b).

According to the Hydrological Risk Assessment prepared for the Proposed Development (Enviroguide Consulting, 2022):

"In the instance of a worst-case unmitigated release of deleterious materials or suspended sediment, there is potential for discharge of contaminants to the surface water network. Surface water within the receiving Camac River may be impacted locally in the immediate vicinity of the surface water drainage outfall from Site.

Taking account of the potential for assimilation within the drainage network and the Camac River and River Liffey downstream of the surface water drainage outfall point, there is a negligible risk to water quality within the River Liffey and Liffey Estuary and Dublin Bay. There is no identified risk to the Natura 2000 and pNHA sites hydraulically connected with the Site in the absence of mitigation and design avoidance measures.

Appropriate design avoidance and mitigation measures will prevent any potential impact to the receiving water quality."

The Hydrological Risk Assessment also states:

"In the absence of mitigation measures there is a potential low risk to groundwater quality within the aquifer beneath and immediately downgradient of the Site.

There is limited potential for vertical migration from surface to the aquifer due to the presence of low permeability clays above the aquifer. Any potential impact to groundwater will be localised as groundwater flow paths (and contaminant migration paths) are expected to be less than 1km and not to extend to Dublin Bay. Therefore, there will be no impact on the identified Natura 2000 sites and pNHA sites hydraulically connected with the Proposed Development Site including in the absence of avoidance and mitigation.

Any potential localised risk to groundwater quality will be addressed and mitigated through standard construction management practices."

As such, it can be concluded that there will be no impacts on the above listed pNHAs (Dolphins Dublin Docks pNHA, North Dublin Bay pNHA, South Dublin Bay pNHA and Booterstown Marsh pNHA) which are hydrologically and hydrogeologically linked to the Site. Impacts of these pNHAs are described as *neutral*.

There is either a significant intervening distance, considerable marine buffer or no hydrological or alternative pathway between the Site of the Proposed Development and the remaining pNHAs in the zone of influence identified in Table 4.6. Therefore, impacts on these pNHAs as a result of the Proposed Development can be ruled out.

As noted in the Hydrological Risk Assessment, there is potential for localised impacts on the River Camac as a result of surface water discharges. It is possible that water borne pollutants (e.g. silt, cementitious residues, oils, grease, anti-freeze, wood preservative) may be conveyed to the River Camac via the local drainage network or run-off from works being undertaken on the bridge during the Construction Phase of the Proposed Development. This could result in a *negative, short-term, moderate* impact on the river and the fauna therein.

4.5.1.2 Birds

Results of the winter bird surveys carried out over two winters (6 days across October, November and December 2020 and January, February and March 2021 and 5 days across December 2021, January and March 2022) confirm very little usage of the Site of the Proposed Development by species listed as of Special Conservation Interest for the relevant SPAs (South Dublin Bay and River Tolka Estuary SPA, Dalkey Islands SPA, Baldoyle Bay SPA, North Bull Island SPA).

As noted in the winter bird survey report (Appendix F of Volume III of the EIA), over the course of the 66 hours surveyed, one observation of Light-bellied Brent Geese was made during the 2020/21 winter. On the 28th of November 2020, a peak count of 14 individuals were found feeding on the Site. No records of this species were made during the 2021/22 winter and no LBBG droppings were recorded at the Site during any of the Site visits. This demonstrates that the Site of the Proposed Development is not a significant *ex-situ* feeding Site for LBBG. The only other SCI recorded on the Site was Black-headed Gull; recorded loafing about on the site in low numbers (Peak count of 43 on 24/01/2022).

Table 4.16 summarises the peak counts of all relevant species recorded on site during the surveys, and compares this with their respective 1% national and international population estimates. These 1% national and international population estimate figures are taken from Lewis *et al.* (2019). National figures from Lewis *et al.* (2019) are based on records 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; and international figures are based on records from Wetlands International (2012 & 2018).

Table 4.16 – Summary of peak counts of all relevant SCI species across the survey period, and respective 1% national and international population estimates

Species	Peak Count	Date	1% National Population	1% International Population
Light-bellied Brent Geese	14	28/11/2020	350	400
Black-headed Gull	43	24/01/2022	n/a*	31,000

*= I-WeBS typically does not record gull species sufficiently in order to be able to generate accurate 1% national figures. Gulls are widely distributed during winter and are not monitored routinely during I-WeBS so standard methods of population estimation and threshold setting cannot be applied. Gull species are therefore not assigned 1% thresholds but rather a 'threshold of significance' is applied that relates to the known most important sites for the species in question (Crowe, 2005). In the case of Black-headed Gull the current threshold of significance is 1,000 (after Crowe, 2005).

Although there is some potential feeding habitat for waterfowl and shorebird species at the Project Site in the form of the amenity grassland present, little to no usage of the Site was recorded during the two winters surveyed. It is noted that the Site is not located in close proximity to the coast and also experiences frequent disturbance in the form of humans passing through the Site walking or with dogs. As such, it is unlikely that the Site would be used regularly if at all by any SCI species other than Gull species. Light-bellied Brent Geese were only recorded feeding on the Site once in winter 2020/21 and the lack of visual records or droppings since then indicate that it is not regularly used as an important feeding site by Light-bellied Brent Geese.

The only gull species recorded at the Site that is an SCI for the SPAs located within 15km of the Site was Black-headed Gull; recorded loafing about on the site in low numbers (Peak count of 43 on 24/01/2022). It is noted that the highest peak count recorded at the Site of 43 Black-headed Gull on one occasion is not deemed to be significant in terms of overall population numbers. As mentioned above the current threshold of significance for Black-headed Gull is 1,000 (Crowe, 2005). The South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA are designated as SPAs due in-part to the fact they supports nationally important numbers of wintering waterbird species including 3,040 and 2,196 Black-headed Gull respectively (NPWS, 2015; NPWS 2014). It is therefore concluded that there will be no loss of any important *ex-situ* foraging/roosting habitat, to any of the SCI species listed for the relevant SPAs, as a result of the Proposed Development.

Other than Black-headed Gulls which were present on all counts, SCI species were noted in flight over the Site on just two occasions (Light-bellied Brent Geese and Oystercatcher) and no significant flight path was observed to be consistently in use over the Site. A lone occurrence of 230 LBBG recorded in January 2022 and a single Oystercatcher in March 2022 were the only SCI waterfowl species recorded in flight over the Site.

Based on initial site assessment/observations, expert opinion, and the findings of the survey itself; it is our considered professional opinion that the Site of the Proposed Development is not currently utilised in any significant manner by SCI species listed for the relevant SPAs. Therefore, it is deemed that the Proposed Development will not have any

significant adverse effects on these species in terms of *ex-situ* habitat loss going forward. The impact is described as *negative, permanent, imperceptible* as per EPA (2022).

Good Counsel GAA Club, Brickfield Park and Dolphin's Barn Green are located ca. 545m, 577m and 900m to the south-east of the Site respectively, and as such it is deemed that there is no potential for impacts to these species, should they be utilising these *ex-situ* sites, as a result of disturbance due to noise, dust or increased human activity at the Site of the Proposed Development during the Construction Phase.

The increased noise and dust levels associated with the Construction Phase of the Proposed Development may have the potential to cause *negative, short-term, not significant* impacts on local bird populations. Increased human presence during the Construction Phase, in addition to increased lighting at the site also has the potential to cause *negative, short-term, not significant* disturbance to birds in the locality.

Should vegetation be cleared or buildings demolished as part of the Construction Phase during the breeding bird season (March 1st to August 31st); there is the potential for nesting birds to be harmed and nests to be destroyed. This would be in contravention of the Wildlife Acts and Amendments (2000) which provides protection to breeding bird species and their nests and young. Therefore, in the absence of any mitigation or precaution, this represents a potential *negative, permanent, slight* impact to local breeding birds.

4.5.1.3 Bats

There is potential for a *negative, short-term, slight* local impact through increased lighting disturbance associated with the Construction Phase of the Proposed Development. High levels of luminance can impair bats' vision leading to disorientation and can result in impacts on bats' roosting sites, commuting routes and foraging areas especially along waterways.

As noted by AEE Ltd (2022), "The results of the bat survey showed no bats emerging from any building onsite, specifically Building 1 and 2 which are affected. There was no evidence of bat signs within Buildings 2 (affected) or Building 3 (unaffected)". As such, it is deemed that the proposed demolition of the existing structures on site will have a *neutral* impact on bats.

4.5.1.4 Otter, Fish and White Clawed Crayfish

It is possible that water borne pollutants (e.g., silt, cementitious residues, oils, grease, anti-freeze, wood preservative) may be conveyed to the River Camac and Liffey Estuary via the local drainage network or run-off from works being undertaken on the Bridge during the Construction Phase of the Proposed Development, and during demolition activities. This could have a *negative, short-term, moderate* impact on Otter, fish and white clawed crayfish during the Construction Phase.

4.5.2 Operational Phase

4.5.2.1 Designated Sites

The Grand Canal pNHA is located to the south of the Site. This stretch of the canal is highly urbanised and is regularly used by members of the public. It is deemed that there is no potential for effects on the Grand Canal as a result of the Proposed Development during the Operational Phase.

No significant effects on are anticipated during the Operational Phase. SuDS measures have been incorporated into the design to treat and minimise surface water runoff from the Site. Impacts during the Operational Phase are described as *neutral*.

4.5.2.2 Landscape Plan

The landscape plan will involve the planting of various planting mixes comprising native and non-native ornamental shrubs, trees and groundcover species within and around the perimeter of the Site (BSLA, 2022). Whilst the majority of the trees and shrubs proposed are non-native species (e.g. Honey Locust *Gleditsia tricanthos*, Sweetgum *Liquidambar styraciflua* and *Amelanchier sp.*) some of the proposed trees and shrubs are native namely Sessile Oak *Quercus petraea* and Silver Birch *Betula pendula*. Native trees/shrubs are also included within the planting mixes such as Hawthorn *Crataegus monogyna*, Holly *Ilex aquifolium*, Hazel *Corylus avellana* and Dog Rose *Rosa canina*. In

addition, some of the species listed in the proposed planting plan are listed on the Pollinator Friendly Planting Code¹⁷, such as domestic fruit trees (apple and pear), *Verbena bonariensis*, *Helleborus* species, *Symphytum* blue, *Achillea* sp., Sage *Salvia officinalis*, Thyme *Thymus* sp. and Marjoram *Origanum* sp. Given that the Site is in an urbanised area and is of low ecological value comprising mainly of amenity grassland, the proposed landscape plan will result in a net gain in vegetative diversity at the Site which will be of value to birds, pollinators and insects. The landscape plan will have a *positive, long-term, slight* impact on biodiversity.

4.5.2.3 Birds

As noted earlier, wintering waterfowl such as Light-bellied Brent Geese and Curlew are known to utilise *ex-situ* inner-city grassland feeding grounds during the winter months (i.e., areas outside of an SPA that may provide important foraging or roosting habitat for SCI species). Those *ex-situ* sites closest to the Site of the Proposed Development include Good Counsel GAA Club (located c. 545m to the south-east), Brickfield Park (located c. 577m to the south-east) and Dolphin's Barn Green (located c. 900m to the south-east). Should wintering waterfowl regularly commute over the Proposed Development Site, there is a potential risk of bird collisions with Site structures.

Other than Black-headed Gulls (which were present on all counts), Special Conservation Interest (SCI) species were noted in flight over the Site on just two occasions during the Wintering Bird surveys carried out (Light-bellied Brent Geese and Oystercatcher) and no significant flight path was observed to be consistently in use over the Site. A lone occurrence of 230 LBBG recorded in January 2022 and a single Oystercatcher in March 2022 were the only SCI waterfowl species recorded in flight over the Site.

Based on initial site assessment/observations, expert opinion, and the findings of the survey itself; it is our considered professional opinion that the Site of the Proposed Development does not currently represent an important flyway for SCI species, with a lone occurrence of 230 Light-bellied brent geese in January 2022 and a single Oystercatcher in March 2022 being the only SCI waterfowl species recorded in flight over the Site. Furthermore, the Proposed Development entails building heights ranging from 1-7 storeys in height (max height 24m) 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 these migration heights. However, even at these lower flight heights, once the proposed buildings are made of visible materials i.e., not entirely comprised of reflective materials such as glass, the birds would simply fly around or over them. The overall façades of the proposed structures are well broken up, with areas of glazing dispersed across a varied material composition. The opaque materials proposed, such as coloured brick and pre-cast concrete, 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. The 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 included as specific mitigation measures to prevent collisions, however, they will contribute to the overall effect in this regard.

Therefore, it is deemed that the Proposed Development will not have any significant adverse effects on these species in terms of flight-line obstruction going forward. The impact is described as *neutral* as per EPA (2022).

It is deemed that the Proposed Development will not have an impact on breeding birds during the Operational Phase.

4.5.2.4 Bats

The proposed public lighting plan will adhere to the various measures outlined in section 4.4.5 above. These measures are in-keeping with the recommendations of the Bat Survey Report (AEE Ltd., 2022) and will serve to minimise the potential ecological impacts of glare, sky glow and obtrusive light (light spill). As such, taking the above into account as well as the existing baseline conditions at the Site (urban environment already subject to illumination) impacts to bats during the Operational Phase are *neutral*.

¹⁷ <https://pollinators.ie/wordpress/wp-content/uploads/2018/04/Planting-Code-2018-WEB.pdf>

4.5.2.5 River Camac, Otter, Fish and White Clawed Crayfish

No significant effects on are anticipated during the Operational Phase. SuDS measures, as described in section 4.4.6, have been incorporated into the design to treat and minimise surface water runoff from the Site. Impacts during the Operational Phase are described as *neutral*.

4.5.3 Potential Cumulative impacts

4.5.3.1 Existing granted planning permissions

There are several existing granted planning permissions on record in the area, ranging from small-scale extensions and alterations to existing residential properties to larger-scale developments.

Relatively large-scale projects which are pending/have been granted permission in the area are outlined below:

Case Ref: KA29N.314091 Liffey Valley to City Centre, County Dublin – Bus Connects. **Application Type:** Local Authority Road CPO **Applicant:** National Transport Authority. **Description:** On the 15th of July 2022, *the National Transport Authority (NTA) has applied under section 51(2) of the Roads Act 1993 (as amended) to An Bord Pleanála ('the Board') for approval in relation to a proposed road development consisting of: The construction of the Liffey Valley to City Centre Core Bus Corridor Scheme which has an overall length of approximately 9.2km and is routed along the Fonthill Road, Coldcut Road, Ballyfermot Road, Sarsfield Road, Memorial Road, Inchicore Road, Grattan Crescent, Emmet Road, Old Kilmainham, Mount Brown, James's Street, Thomas Street and High Street, all in the County of Dublin and within the South Dublin County Council (SDCC) and Dublin City Council (DCC) administrative area. The Case is due to be decided by 25/01/2023.*

Planning Ref: 2997/21. **Applicant:** Derek Kelly. **Address:** Emmet Manor, Emmet Court, Saint Vincent Street West, Dublin, 8. **Decision date:** 10-Feb-2022. **Decision:** REQUEST AI EXT OF TIME. **Description:** *The development will consist of: (i) Construction of a four-storey flat-roofed apartment block comprising 4 no. one-bedroom and 12 no. two-bedroom apartments each to be served by private south facing terraces and 1 no. vehicular parking space; (ii) Provision of new bicycle shed and bin store to serve apartment block; and (iii) All ancillary works, inclusive of landscaping and SuDS drainage, necessary to facilitate the development. The proposal will increase the number of residential apartments within Emmet Court from 96 to 112 and reduce the number of car parking spaces from 87 to 75.*

Planning Ref: 3815/20. **Application Type:** Permission. **Applicant:** Board of Management of Our Lady of Lourdes National School. **Address:** Our Lady of Lourdes National School, Goldenbridge, Inchicore, Dublin 8. **Granted:** 11-Mar-2021. **Description:** *PROTECTED STRUCTURE: The site is bordered by St. Vincent Street West and Emmet Crescent. The proposed development consists of: A) Phased demolition of the middle section of the existing school building; removal of prefabricated temporary teaching accommodation units and selected trees. B) Refurbishment and alterations of the retained sections of the building including internal works to existing classrooms on ground floor to provide a new two classroom special educational needs unit and provision of the application of new insulated rendering system to building facades and upgrade of existing windows and doors. C) Construction of two-storey extension to the middle section of the existing school building, consisting of a general purpose hall, special education tuition rooms, multi-purpose room, home school liaison room, 4 no. general classrooms, a library, offices, staff room, stores, toilets, circulation areas, and ancillary accommodation. D) Provision of 22 no. on-site car parking spaces. E) Widening of existing vehicular access and provision for a new pedestrian site access with refurbishment of existing gates and provision of new gates all facing Emmet Crescent Street. F) Provision of 60 no. on-site bicycle parking spaces; refurbishment of gate facing St. Vincent Street West; provision of covered bin store. G) Provision of new hard surfaced and planted play and amenity areas, erection of 6 no. new flagpoles, refurbishment and upgrade of existing boundary walls, fences and gates (as described above and including a pedestrian gate towards the convent at the western site boundary), and provision of ancillary site works at this location. The site is in the curtilage of protected structures, Sisters of Mercy Chapel & Convent to the west.*

Planning Ref: 4260/19. **Application Type:** Permission. **Applicant:** Circle Voluntary Housing Association. **Address:** Site 1b St. Michael's Estate, Inchicore, Dublin 8. **Granted:** 24-Jan-2020. **Description:** *Permission for development at this site (0.72 hectare), known as Site 1b St. Michael's Estate, Inchicore, Dublin 8 bounded by Richmond Barracks to the north, the rear of Connolly Avenue to the east and Thornton Heights to the south. The development will consist of a one to four storey older persons housing with supports scheme, incorporating: (i) 52 no. apartment dwellings with balconies; (a) 16 no. 2 bedroom apartments; (b) 36 no. 1.5 bedroom apartments. (ii) Communal facilities at ground floor level to include a multipurpose room, additional ancillary spaces, staff offices and a publicly accessible tea room (26.5m²). (iii) Landscaping works to include resident courtyards and a landscaped*

open space (facing the St. Michaels Estate road) incorporating a new vehicle setdown area. (iv) 15 no. car parking spaces. (13 no. new car parking spaces to be accessed from an existing vehicular entrance and the relocation of 2 no. existing car parking spaces adjacent to the new vehicle setdown area). (v) 52 no. bicycle parking spaces. (vi) (ESB substation), external signage, site perimeter boundary treatments, plant rooms, waste storage enclosures and all associated ancillary development works and services. (vii) The development will consist of the following floor areas: - Total gross internal floor area (GIA): 4,655m² (inclusive of all residential, communal, vertical circulation & ancillary spaces). - Area of external deck/gallery access (excluding balconies): 1,066.6m². - Area of roof terrace (excluding balconies): 100.1m². (viii) The building will be one to four storeys in height, with a top parapet level of 40.04m OD (measuring 14.835m above finished ground floor level).

Planning Ref: 2453/19. **Application Type:** Permission. **Applicant:** Vabtol Limited. Association. **Address:** Site to the rear of 205A, Emmet Road, Inchicore, Dublin 8. **Granted:** 29-July-2019. **Description:** Amendment to Planning Ref. No. 3635/16 for the previous approved 4-storey apartment development in the backlands for the increase in height to six storey building above semi-basement level consisting of: 6 no. one-bed, 18 no. two-bed apartments; which include balconies to the north, west & south elevations, additional covered bike storage areas, refuse store, with revised 18 no. car parking spaces off vehicular access road from Emmet Road, with associated landscaping & site works.

Planning Ref: 2747/20. **Application Type:** Permission. **Applicant:** Durkan (Davitt Road) Ltd. **Address:** Former Dulux Factory Site, Davitt Road, Dublin 12, D12 C97T. **Granted:** 04-Nov-2020. **Description:** The development will consist of modifications to development previously permitted under Reg. Ref. ABP-303435-19 (DCC Ref. SHD0002/19). The modifications for permission consist of (a) alteration to window format at third and fourth floor level on east and west elevation to provide windows to corridor only; (b) window format altered at sixth floor level of south elevation of Blocks A and B; (c) balconies and windows removed from eastern elevation of 4no. apartments at fifth and sixth floor level of Block B due to internal layout requirements related to fire safety; (d) extension of elevator and lift core within Block A from fourth floor to fifth floor level for fire safety purposes, giving an overall height increase of 3.7m; (e) communal lounge extended by 3sqm to connect to extended lift/stair core at fifth floor level; (f) ESB Kiosk (approx. 23.47sqm) at Galtymore Road elevation relocated approximately 6m to the east and redesigned to ESB standards; (g) bin store added to internal layout of ESB substation building (approx. 7.09sqm); (h) bin store (approx. 9.77sqm) added to eastern courtyard; (i) accessible rest room added to guest room at fifth floor level; (j) glazed balconies converted to brick at ground floor level of south elevation and east and west internal courtyard elevations; (k) alteration to glazing at street level of Block B fronting Davitt Road; (l) alterations to selected balconies (8no.) at third and fifth floor to convert from cladding to glazed treatment; and (m) unit layouts of apartments 104 and 110 at first and second floor of block B, fronting Davitt Road, reconfigured to allow sufficient separation distance between proposed balconies and ground floor ESB substation entrance.

On examination of the above developments and taking into consideration the urban context of the Proposed Development, it is considered that there are no means for the Proposed Development to act in-combination with any project that would cause any likely significant effects on local biodiversity.

4.5.3.2 Relevant policies and plans

Plans and policies that may result in possible in-combination effects with the Proposed Development include:

- Dublin City Biodiversity Action Plan 2015 - 2020
- Draft Dublin City Biodiversity Action Plan 2021-2025
- Dublin City Development Plan 2016-2022
- Draft Dublin City Development Plan 2022-2028

There is potential for proposed plans and projects within the Dublin City Development Plan 2016-2022 and Draft Dublin City Development Plan 2022-2028 land area, to have cumulative, negative impacts on conditions in Dublin Bay via rivers, other surface water features and foul waters treated at Ringsend WWTP and discharged into Dublin Bay. However, the core strategy, policies and objectives of the Dublin City Development Plan and Draft Dublin City Development Plan have been developed to anticipate and avoid the need for developments that would be likely to significantly affect the integrity of any European site and biodiversity. In addition, sustainable development including SuDS measures for all new developments is inherent in the objectives of all development plans within the Greater Dublin Area. Therefore, it is unlikely that cumulative impacts due to of surface water discharges will exist during the Operational Phases of the Proposed Development.

4.5.3.3 Operation of Ringsend WwTP

In June 2018 Irish Water applied for and subsequently received planning permission in 2019 for upgrade works to the Ringsend WwTP facility. The first phase of upgrade works to Ringsend WwTP was completed in December 2021, which increased the capacity of the plant by 400,000 P.E. These works, together with the future works permitted will ultimately increase the capacity of the facility from 1.6 million P.E. to 2.4 million P.E. This plant upgrade will result in an overall reduction in the final effluent discharge of several parameters from the facility including BOD, suspended solids, ammonia, DIN and MRP. An Environmental Impact Assessment Report (EIAR) was submitted by Irish Water as part of this application. The EIAR contains sections relating to Marine Biodiversity and Terrestrial Biodiversity, and each contains a section on the 'do-nothing scenario'. These review the effects of the WwTP on biodiversity in Dublin Bay in the absence of the upgrade works and so are relevant to this report.

The EIAR report acknowledges that under the do-nothing scenario “the areas in the Tolka Estuary and North Bull Island channel will continue to be affected by the cumulative nutrient loads from the river Liffey and Tolka and the effluent from the Ringsend WwTP”, which could result in a decline in biodiversity (Irish Water, 2018). Nevertheless, the negative impacts of nutrient over-enrichment, which could result in the deterioration of the biological status of Dublin Bay are considered “unlikely” (Irish Water, 2018). This is because historical data suggests that pollution in Dublin Bay has had little or no effect on the composition and richness of the benthic macroinvertebrate fauna. The EIAR notes that “*although a localised decline could occur, it is not envisaged to be to a scale that could pose a threat to the shellfish, fish, bird or marine mammal populations that occur in the area.*” Furthermore, the EIAR notes that significant impacts on waterbird populations foraging on invertebrates in Dublin Bay due to nutrient over-enrichment are “unlikely” to occur (Irish Water, 2018). What is important in the context of this Biodiversity Chapter is that the do-nothing scenario predicts that nutrient and suspended solid loads from the WwTP will “*continue at the same levels and the impact of these loadings should maintain the same level of effects on marine biodiversity*” and that “*if the status quo is maintained there will be little or no change in the majority of the intertidal faunal assemblages found in Dublin Bay which would likely continue to be relatively diverse and rich across the bay.*”

Therefore, it can be concluded that effects on marine biodiversity and the Natura 2000 sites within Dublin Bay from the *current* operation of Ringsend WwTP are unlikely. Importantly, this conclusion is not dependent upon any future works to be undertaken at Ringsend. Thus, in the absence of any upgrading works, significant effects to habitats, fauna and Natura 2000 sites are not likely to arise.

Finally, a pre-connection enquiry form (IW Ref Nr. CDS22003279) was submitted to Irish Water, with Confirmation of Feasibility subsequently confirmed by Irish Water, without the requirement for any upgrades (OCSC, 2022).

On examination of the above it is considered that there are no means for the Proposed Development to act in combination with any plans or projects.

4.5.4 “Do Nothing” Scenario

Under the do-nothing scenario, large areas of the Site would remain as they are. The Buddleia scrub to the north of the Site may increase in size if it is not managed in the future. Given the large proportion of built land and amenity grassland on the site the ecological value of this site is relatively low.

4.6 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

4.6.1 Construction Phase

4.6.1.1 Protection of Surface Waters and Aquatic Fauna

The following mitigation measures will protect surface waters during the Construction Phase of the Proposed Development:

All works carried out as part of the Proposed Development will comply with all Statutory Legislation including the Local Government (Water Pollution) acts, 1977 and 1990 and the contractor will cooperate fully with the Environment Section of Dublin City Council in this regard.

Personnel working on the Site will be trained in the implementation of environmental control and emergency procedures. Procedures and relevant documents produced will be formulated in consideration of standard best international 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;
- 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.

The following standard measures will protect surface water and groundwater during the Construction Phase of the Proposed Development:

- Silty water generated on Site will be treated using silt trays/settlement ponds/settlement tanks and temporary interceptors and traps will be installed until such time as permanent facilities are constructed.
- All containment and treatment facilities will be regularly inspected and maintained.
- Any other diesel, fuel or hydraulic oils stored on site will be stored in bunded storage tanks- the bunded area will have a volume of at least 110% of the volume of the stored materials as per best practice guidelines (Enterprise Ireland, BPGCS005);
- Portaloos and/or containerised toilets and welfare units will be used to provide facilities for site personnel. All associated waste will be removed from site by a licenced waste disposal contractor.
- Runoff from machine service and concrete mixing areas will not enter the drainage network.
- Discharge water generated during placement of concrete will be stored and removed off site for treatment and disposal.
- There will be no washing out of any concrete trucks on site.
- Specific areas for storage, delivery, loading/unloading of materials will be designated, which will have appropriate containment/spill protection measures where required.
- Leachate generation from stockpiles or waste receptacles will be prevented by using waterproof covers.
- If contaminated soils are encountered during construction works or if material becomes contaminated by, for example a fuel spill or hydraulic fluid leak the contaminated materials will be segregated, placed on an impermeable membrane so as to prevent contamination of the underlying ground and covered to prevent contaminants being mobilised by rainwater run-off. The materials will remain covered until such time as they can be compliantly removed from site by appropriately authorised waste management contractors.
- A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances.
- Refuelling of plant during the Construction Phase will only be carried out at designated refuelling station locations on site. Each station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on site.
- Appropriate bunding, storage and signage arrangements for all deleterious substances will be used.
- Robust and appropriate Spill Response Plan and Environmental Emergency Plans will be implemented for the duration of the works.
- A register will be kept of all hazardous substances either used on site or expected to be present. The register shall be available at all times and shall include as a minimum: valid safety sheets; Health & Safety, environmental controls to be implemented when storing, handling, using and in the event of spillage of materials; emergency response procedures/precautions for each material; the Personal Protective Equipment (PPE) required when using the material.
- All existing services will be mapped, and a plan will be put in place to decommission/divert or manage any drains or sewers which are associated with the Site.
- A plan for dealing with any unknown drains or services which may be encountered during the works will be set out and implemented.
- Any drains or sewers which could act as pathways for contamination from the Site will be protected where required. Surface water on Site will likely be required to be passed through settlement tanks and similar, with controlled discharge to the public network. This will be subject to approval of a construction discharge license from Dublin City Council.

All wastewater generated on-site during the Construction Phase will be stored and disposed of appropriately. Under no circumstances will any untreated wastewater generated onsite (from equipment washing, road sweeping etc.) be released into nearby drainage ditches or watercourses. There will be no uncontrolled discharges to ground (groundwater) or surface water.

Only soil and other materials identified as suitable for use in accordance with regulatory standards and that will not pose a risk to the receiving environment will be used during the Construction Phase.

Surface water runoff management will be implemented to prevent runoff entering excavations during construction and to the existing surface water drainage network. Surface water will require diversion around the open excavations using standard temporary drainage methods to ensure that surface water is effectively conveyed around works areas and with no impacts to the overall existing surface water flow regime.

All below (below ground) drainage infrastructure will be constructed in accordance with current IW requirements to ensure that there are no potential impacts to groundwater quality.

If shallow groundwater is encountered during excavations, dewatering methodology to be implemented where required by the contractor and will ensure that any dewatering is confined to the localised zone and does not impact offsite receptors. Discharges from the Proposed Development will be in accordance with relevant statutory approvals from Irish Water for discharges to sewer and Dublin city Council for discharges to surface water.

4.6.1.2 Removal of Invasive Alien Plant Species

Three invasive plant species were recorded at the Site of the Proposed Development during the surveys carried out in 2020, 2021 and 2022, namely Butterfly Bush *Buddleja davidii*, Montbretia *Crocsmia x crocosmiiflora* and Sycamore *Acer pseudoplatanus*. No species listed on Schedule III of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011, as amended) were recorded at the Site. Butterfly Bush was abundant throughout the Site, the largest stand was recorded growing within the recolonising bare ground habitat, however, plants were also recorded growing within walls and other areas of hardstanding within the Site.

Physical removal of Butterfly Bush, Monbretia and Sycamore will be undertaken during Site clearance activities. Disposal of all plant material will be undertaken with due caution to prevent accidental spread of the plant. Where Butterfly Bush is growing within walls or structures for retention and physical removal of the *entire* plant is not possible, a combination of physical and chemical control would be the most appropriate management approach. According to TII (2020a) “*effective control can be achieved by cutting Buddleia plants to a basal stump during active growth (late spring to early summer) and immediately treating the total cut surface with herbicide concentrate. Monitoring will be required and retreatment, as necessary. Do not leave cut stems and branches on the ground as they will re-root and produce new plants.*”

4.6.1.3 Fauna

Construction Phase Lighting

To protect bats and other nocturnal fauna from lighting associated with the **Construction Phase** of the Proposed Development, any Construction Phase external lighting will follow the most recent BCT Lighting Guidelines (BCT, 2018):

- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

Reduction of noise and dust related impacts

Reduction of noise impacts

To mitigate the potential effects (disturbance) to faunal species in the vicinity of the project site, the following measures will be implemented:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoidance of 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 originates from 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 nesting birds or any other fauna species in the vicinity of the Site of the Proposed Development will be reduced to a minimum.

Reduction of dust related impacts

The following general dust control measures will be followed for the duration of the Construction Phase of the Proposed Development, and will ensure no significant dust related impacts occur to nearby sensitive receptors including local faunal species:

- In situations where the source of dust is within 25m of sensitive receptors screens (permeable or semi-permeable) will be erected.
- Haulage vehicles transporting gravel and other similar materials to site will be covered by a tarpaulin or similar.
- Access and exit of vehicles will be restricted to certain access/exit points.
- Vehicle speed restrictions of 20km/hr will be in place.
- Water bowsters will be available during periods of dry weather throughout the construction period.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowster will operate to ensure moisture content is high enough to increase the stability of the soil thereby reducing the amount of dust.
- Stockpiles will be stored in sheltered areas of the site, covered, and watered regularly or as needed if exposed during dry weather.
- If necessary, gravel will be used at site exit points to remove caked-on dirt from tyre tracks.
- Equipment will be washed at the end of each work day, if necessary.
- Hard surfaced roads will be wet swept to remove any deposited materials.
- Unsurfaced roads will be restricted to essential traffic only.
- Wheel-washing facilities should be located at all exits from the construction site, where necessary.
- Dust production as a result of site activity will be minimised by regular cleaning of the site access roads using vacuum road sweepers and washers. Access roads should be cleaned at least 0.5km on either side of the approach roads to the access points.
- Public roads outside the site shall be regularly inspected for cleanliness, as a minimum daily, and cleaned as necessary. A road sweeper will be made available to ensure that public roads are kept free of debris.
- The frequency of cleaning will be determined by the site agent and is weather and activity dependent
- The height of stockpiles will be kept to a minimum and slopes should be gentle to avoid windblown soil dust.
- The following will be dampened during dry weather:
 - Unpaved areas subject to traffic and wind
 - Stockpiles
 - Areas where there will be loading and unloading of dust-generating materials

- Under no circumstances should wastewater from equipment, wheel or surface cleaning enter the surface water drainage network.

Vegetation Clearance/Building Demolition

Any clearance of vegetation will be carried out outside the main breeding season, i.e. 1st March to 31st August, in compliance with the Wildlife Act 2000. Should any vegetation removal be required during this period, the NPWS will be consulted, and instruction taken from them. If the buildings on Site are to be demolished during the breeding bird season, the buildings will be inspected for breeding birds (e.g. Herring Gull, Swallows) prior to demolition. Should nesting birds be discovered, the nest will be protected until any nesting birds have fledged and departed the site.

While Building 1 and 2 were considered to be of Low bat Roost suitability and there was no emergence from same, a pre-demolition bat survey will be carried out if these buildings are to be demolished between March and October to ensure no bats are present at this time.

4.6.1.4 Biosecurity

The following will be adhered to, to avoid the introduction of invasive species to the Proposed Development site.

- Any material required on the site will be sourced from a stock that has been screened for the presence of any invasive species by a suitably qualified ecologist and where it is confirmed that none are present.
- All machinery will be thoroughly cleaned and disinfected prior to arrival on site to prevent the spread of invasive species.

4.6.2 Operational Phase

4.6.2.1 Bats

A range of options for enhancing bat roosting opportunities at the Site have been provided in the Bat Report and include installation of integrated bat bricks or boxes onto site structures, installation of pole mounted bat boxes and installation of bat boxes onto trees in nearby lands owned by Dublin City Council.

The Project Ecologist discussed the potential for installing integrated bat bricks or boxes onto buildings with the Architect. However, it was deemed that there were no suitable locations for bat boxes within/on the proposed buildings. This was namely due to proximity of the proposed bat bricks/boxes to balconies and windows of residential units and lack of suitable commuting or foraging habitat near the proposed boxes. As such, to enhance the Site for bats, 5 no. pole mounted bat boxes will be installed along the southern boundary of the Site near Goldenbridge Cemetery¹⁸. Bat boxes will be installed under the supervision of a suitably qualified bat expert.

4.7 “WORST CASE” SCENARIO

4.7.1 Construction and Operational Phase

In relation to potential biodiversity impacts, a “worst case” scenario would occur as a result of the generation of uncontrolled or unmitigated lighting, surface water discharges, dust and noise if the mitigation measures described above are not implemented. This would result in excessive light, noise or dust emissions and surface water discharges from the site which may cause nuisance and disturbance to local receptors.

4.8 RESIDUAL IMPACTS

Residual impacts are impacts that remain once mitigation has been implemented or impacts that cannot be mitigated. Table 4.17 provides a summary of the impact assessment for the identified Key Ecological Resources (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 Development, no significant negative residual impacts on the local ecology or on any designated nature conservation sites are expected from the Proposed Development.

¹⁸ <https://www.nhbs.com/pole-mounted-maternity-bat-box>

4.8.1 Proposed Natural Heritage Areas and River Camac

The Site is hydrologically linked to Dublin Bay the surface water drainage network and the River Camac. The Hydrological Risk Assessment has identified negligible impacts on pNHAs in Dublin Bay during both the Construction and Operational Phase. There is a risk of localised impacts on the River Camac however these are readily avoided via standard Construction Phase mitigation measures and SUDS.

4.8.2 Habitats

In relation to local habitats, the Proposed Development is located in an area of low ecological value and as such is predicted to have a negligible effect on habitats at the Site. Specific local mitigation measures include the avoidance of cutting of vegetation during the bird nesting season with regard to the construction phase. The habitats at the Site will be enhanced via the planting of native and ornamental pollinator friendly trees, shrubs and ground cover plants.

The River Camac is an important watercourse linked to the Site via the sewerage system. Mitigation measures have been included in this chapter to protect the River Camac.

4.8.3 Fauna

Bats

There is no evidence of a bat roost on Site, therefore no significant direct negative impacts on bats are predicted to result from the Proposed Development. Bat friendly lighting has been incorporated into the public lighting scheme. Habitat enhancement including the installation of bat boxes and enhancement associated with the landscape plan (e.g., planting of native and ornamental pollinator friendly trees and shrubs) may have positive effects on bats in the locality.

Birds

The Site is of limited value for local bird populations. Provided that construction related noise control/minimisation measures are included in the CEMP and no removal of vegetation or building demolition takes place during the nesting season, impacts on birds are predicted to be negligible.

Otter, White-clawed Crayfish and Fish

The Site is hydrologically linked to the River Camac via the surface water drainage network. The River Camac is known to support Otter, salmonids, eel, lamprey and crayfish populations. In addition, Otter are known to occur with the Grand Canal. Provided that surface water protection measures as outlined above are included in the CEMP, impacts on these aquatic species are predicted to be negligible.

Table 4.17 – 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	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
Designated Site (pNHAs and Dublin Bay Biosphere)	National-International Importance	Construction Phase Water quality deterioration	Neutral	n/a	n/a	n/a	None Required	Negligible
		Operational Phase None – SUDS measures included in project design as described in section 4.4.6.	Neutral					
River Camac	County Importance	Construction Phase Water quality deterioration	Negative	Local	Short-term	Moderate	Incorporation of measures to protect surface waters as outlined in section 4.6.1.1 of this Chapter.	Negligible
		Operational Phase None – SUDS measures included in project design as described in section 4.4.6	Neutral					
Bat assemblage	Local Importance (Higher Value)	Construction Phase Disturbance due to increased lighting at the Site.	Negative	Local	Short-term	Slight	Bat sensitive lighting measures implemented during Construction Phase. Placement and maintenance of 5 no. pole mounted bat boxes along the southern Site boundary adjacent to Goldenbridge Cemetery. Planting of native tree species.	Negligible Positive; long-term
		Demolition of Buildings 1 and 2	Neutral					
		Operational Phase Increased lighting at Site as per lighting plan prepared by IN2 (2022).	Neutral					

Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
Bird assemblage (Amber-listed)	Local Importance (Higher Value)	Construction Phase Loss of ex-situ habitat	Negative	Local	Permanent	Imperceptible	None required	Negligible.
		Disturbance due to increased human presence, noise and dust levels as well as vegetation removal associated with the Construction Phase of the Proposed Development	Negative	Local	Short-term	Not Significant-Slight	Construction related noise control/dust minimisation measures to be included in CEMP. Mitigation re. vegetation clearance and building demolition to be implemented	
		Operational Phase Flight-line obstruction	Neutral				Proposed landscape plan may add to the overall biodiversity value of the Site, such as planting of native shrub and tree species.	
Aquatic Fauna: Otter, Atlantic salmon; Brown trout; European Eel <i>Lampetra</i> spp.; White-clawed crayfish	Local Importance (Higher Value)	Construction Phase Disturbance due to water pollution during Construction Phase	Negative	Local	Short-term	Moderate	Incorporation of measures to protect surface waters as outlined in section 4.6.1.1 of this Chapter.	Negligible.
		Operational Phase None – SUDS measures included in project design as described in section 4.4.6.	Neutral					

4.9 MONITORING

4.9.1 Surface Water Protection

Regular monitoring will be carried out by the contractor to ensure water quality protection measures (e.g., drain protection) are working throughout entire construction phase. All containment and treatment facilities will be maintained and inspected regularly based on Site and weather conditions for any signs of contamination or excessive silt deposits and records of these checks will be maintained.

4.9.2 Invasive Flora

Monitoring for regrowth of all invasive flora treated/removed at the Site will be carried out for 2 years following treatment/removal, by a suitably qualified ecologist. Further monitoring may be required if treatment has not been successful. A site may be considered remediated after two consecutive growing seasons with no sign of regrowth from all of the previously identified stands (TII, 2020b).

4.9.3 Bat Mitigation

Monitoring will be carried out post-construction works. This monitoring will involve the following:

- Inspection of bat boxes within one year of erection of bat box scheme. Register bat box scheme with Bat Conservation Ireland. This should be undertaken for a minimum of 2 years.
- A full summer bat survey will be carried out post-works.
- Specific monitoring in relation to the proposed lighting scheme will be undertaken to determine whether lux levels have increased at Goldenbridge Cemetery.

4.10 REINSTATEMENT

There are no requirements for reinstatement.

4.11 INTERACTIONS

Please refer to Chapter 16 for Interactions.

4.12 DIFFICULTIES ENCOUNTERED IN COMPILING

An extensive search of available datasets for records of rare and protected species within proximity of the Proposed Development has been undertaken as part of this assessment. However, the records from these datasets do not constitute a complete species list. The absence of species from these datasets does not necessarily confirm an absence of species in the area.

During the bat survey carried out by AEE Ltd. in 2022, Building 1 was not surveyed from the inside and the building inspection carried out was limited to an external inspection. As noted in the bat report prepared by AEE Ltd., Building 1 had some bat potential e.g., heavy ivy on walls, entry points via old vent holes, wooden soffits; however, given the high levels of city street lighting and limited foraging and commuting habitat, together with no bat emergence on the nights of surveys, it is unlikely bats are using this building. As such, the absence of an interior inspection of building 1 is not deemed to represent a significant limitation to the bat survey. No limitations or difficulties were encountered which would prevent robust conclusions being drawn as to the potential impacts of the Proposed Development.

4.13 SUMMARY

It is considered that, provided the mitigation measures proposed are carried out in full, there will be no significant negative impact to any valued habitats, designated sites or individual or group of species as a result of the Proposed Development.

4.14 REFERENCES

AEE Ltd. (2022). Bat Survey Report. Emmet Road, Inchicore, Dublin 8.

Bat Conservation Ireland. (2014). Bats in Buildings, Guidance Notes for: Planners, engineers, architects and developers.

- Benson, L. (2009) Use of inland feeding sites by Light-bellied Brent geese in Dublin 2008 – 2009: a new conservation concern. *Irish Birds* 8, 563-570.
- Bernard Seymour Landscape Architect. (2022). Emmet Road Mixed-Use Development Planting Masterplan.
- Central and Regional Fisheries Boards. 2008. Sampling Fish for the Water Framework Directive – Transitional Waters 2008. Liffey Estuary.
- 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.
- Crowe, O. (2005) Ireland's Wetlands and their waterbirds: status and distribution. BirdWatch Ireland. Co. Wicklow, Ireland.
- Crowe, O. & Holt, C. (2013) Estimates of waterbird numbers wintering in Ireland 2006/07 – 2010/11. *Irish Birds* 9, 545-552.
- Department of the Environment, Heritage and Local Government. (2010). Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. DEHLG, Dublin. (Rev. Feb 2010).
- Eastern Regional Fisheries Board. (2004). Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites. Blackrock, Dublin, Ireland.
- Environmental Protection Agency. (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports. Published by the Environmental Protection Agency, Ireland.
- Environmental Protection Agency. (2022). Environmental Protection Agency Online Mapping [ONLINE] Available at: <http://www.epa.ie/> [Accessed June 2022].
- European Commission. (2000). Managing Natura 2000 Sites: The Provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. European Communities, Luxembourg.
- European Communities. (2002). Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. European Communities, Luxembourg.
- Fossitt, J. (2000). A Guide to Habitats in Ireland. The Heritage Council, Kilkenny.
- Gauthreaux, S. A., and Belser, C. G. (2006). Effects of artificial night lighting on migrating birds. Pages 67–93 in C. Rich and T. Longcore, editors. *Ecological consequences of artificial night lighting*. Island Press, Washington, D.C., USA.
- Geological Survey Ireland. (2022). Geological Survey of Ireland website [ONLINE] Available at: <http://www.gsi.ie/> [Accessed June 2022].
- Greater Dublin Strategic Drainage Study. (2005). Final Strategy Report. [ONLINE] Available at: <http://www.greaterdublindrainage.com/wp-content/uploads/2011/11/GDSDS-Final-Strategy-Report-April-051.pdf> [Accessed August 2020].
- 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* 104: 43–56.
- IN2 (2022). Site Lighting Report. DCC Emmet Road, Inchicore, Dublin 8.
- Inland Fisheries Ireland. (2016). Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters. Available at: <https://www.fisheriesireland.ie/documents/624-guidelines-on-protection-of-fisheries-during-construction-works-in-and-adjacent-to-waters/file.html>
- Institute 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://cdn.bats.org.uk/pdf/Resources/ilp-guidance-note-8-bats-and-artificial-lighting-compressed.pdf?mtime=20181113114229>
- Kelleher, C. and Marnell, F. (2006). Bat Mitigation Guidelines for Ireland. *Irish Wildlife Manuals*, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- Kelly, F.L., Harrison, A., Matson, R., Connor, L., O'Callaghan, R., Feeney, R., Morrissey, E., E., Wogerbauer, C. and Rocks, K. 2010. Sampling Fish for the Water Framework Directive, Transitional Waters 2010, Liffey Estuary. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland.

- Kelly, F.L., Matson, R., Connor, L., Feeney, R., Morrissey, E., Wogerbauer, C. and Rocks, K. (2012). Water Framework Directive Fish Stock Survey of Rivers in the Eastern River Basin District. Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland.
- Kelly, F.L., Connor, L., Matson, R., Feeney, R., Morrissey, E., Coyne, J. and Rocks, K. (2015). Sampling Fish for the Water Framework Directive, Rivers 2014. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland.
- 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. & Cassidy, D. (2011). Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- Lundy, M.G., Aughney, T., Montgomery, W.I., & Roche, N. (2011). Landscape conservation for Irish bats and species specific roosting characteristics. Bat Conservation Ireland.
- 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.
- Matson, R., Delanty, K., Gordon, P., O’Briain, R., Garland, D., Cierpal, D., Connor, L., Corcoran, W., Coyne, J., McLoone, P., Morrissey-McCaffrey, E., Brett, T., Ní Dhonnabhain, L. and Kelly, F.L. (2018). Sampling Fish in Rivers 2017 – Camac, Factsheet No. 3. National Research Survey Programme. Inland Fisheries Ireland.
- NBDC. (2022). National Biodiversity Data Centre online mapping [ONLINE]. Available at: <http://maps.biodiversity.ie/Map.aspx>. [Accessed June 2022].
- NPWS. (2009a). Grand Canal pNHA Site Synopsis.
- NPWS. (2009b). Booterstown Marsh pNHA Site Synopsis.
- NPWS. (2010). Circular NPW 1/10 & PSSP 2/10. Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Department of Environment, Heritage and Local Government.
- NPWS. (2013). The Status of Protected EU Habitats and Species in Ireland. Overview Volume 1. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland. Editor: Deirdre Lynn
- NRA. (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes. National Roads Authority (now Transport Infrastructure Ireland), Dublin.
- O’Boyle, S., Trodd, W., Bradley, C., Tierney, D., Wilkes, R., Ní Longphuirt, S., Smith, J., Stephens, A., Barry, J., Maher, P., McGinn, R., Mockler, E., Deakin, J., Craig, M. and Gurrie, M. 2019. Water Quality in Ireland 2013-2018. Environmental Protection Agency, Johnstown.
- O’Connor Sutton Cronin (2022). Engineering Services Report. Development at Emmet Road, Dublin 8.
- Smith, G.F., O’Donoghue, P., O’Hora, K. and Delaney, E. (2011). Best practice guidance for habitat survey and mapping. The Heritage Council, Kilkenny.
- Transport Infrastructure Ireland. (2020a). The Management of Invasive Alien Plant Species on National Roads – Technical Guidance. GE-ENV-01105. December 2020
- Transport Infrastructure Ireland. (2020b). The Management of Invasive Alien Plant Species on National Roads – Standard. GE-ENV-01104. December 2020

5.0 LAND AND SOILS

5.1 INTRODUCTION

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

Land and Soils

- Geology - Subsoil and Bedrock
- Hydrogeology

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

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

Assessments for the site are detailed in this Chapter with relevant technical information included in the following standalone reports which are included in Appendix C, Volume III of this EIAR:

OCSC Generic Quantitative Risk Assessment (GQRA) Report
OCSC Waste Soil Classification Report

5.2 ASSESSMENT METHODOLOGY

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

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, May 2022);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment August 2018;
- Advice Notes for preparing Environmental Impact Statements DRAFT (EPA, September 2015);
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements (EPA, 2003);
- Guidelines for the preparation of Soils Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013);
- Geology in Environmental Impact Statements, A Guide (Institute of Geologists of Ireland (IGI), 2002);
- Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Roads Authority (NRA) 2009);
- Control of Water Pollution from Construction Sites (CIRIA, 2001); and
- Environmental Handbook for Building and Civil Engineering Projects (Construction Industry Research and Information Association (CIRIA), 2000).

The assessment followed a phased approach as outlined in the EPA and IGI Guidelines (2022 and 2013). A Conceptual Site Model (CSM) was developed in order to identify any likely Source-Pathway-Receptor linkages relating to the site and the proposed development. The phases of assessment are outlined below.

5.2.1 Phase 1: Initial Assessment

An initial assessment was carried out which defined the project in terms of location, type, and scale; established the baseline conditions; established the type of soil/ geological environment; established the activities associated with the project and associated watermains upgrade; and determined the predicted impacts of the project and associated watermains upgrade.

These objectives were achieved by way of a geological desk study and baseline data collection. A full list of sources for the desk study together with relevant legislation are included in the Section 5.15 and are briefly listed below:

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

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

The information obtained from the above listed sources were utilised to establish the baseline conditions for the site and the area of the associated watermain upgrade. All available information was then compiled into a preliminary Conceptual Site Model (CSM). The CSM is based on the accepted Source-Pathway-Receptor model for assessing environmental impacts. The CSM went through iterative reviews and was updated with site specific data obtained through site investigations and studies.

5.2.2 Phase 2: Direct and Indirect Site Investigations and Studies

Under the supervision of OCSC, Ground Investigations Ireland (GII) Limited, undertook a site investigation between September and October 2020 on the proposed development site but not within the area of the proposed watermain upgrade. An interpretative report based on the site investigation and sampling exercise is documented in the GII report contained in Appendix D of the GQRA report (OCSC, 2020) contained in Appendix C Volume III of this EIAR. The intrusive investigation completed included the following:

- 51 window sampling locations
- 14 Trial Pit locations
- GeoBore locations
- Logging and sampling of borehole arisings
- Analysis of a selection of samples for geotechnical and chemical properties
- 221No. soil samples collected and analysed (224No. samples for asbestos analysis)
- Gas Monitoring of 10 standpipe locations
- Sampling and analysis of groundwater
- Assessment of the soil chemistry results

A Generic Quantitative Risk Assessment based on the site investigation and sampling exercise is documented in the GQRA Report for the site (OCSC, 2020). A Waste Soil Classification (WSC) assessment was also completed and is included in a standalone Waste Soil Classification Report (OCSC, 2020). Both of these reports are contained in Appendix C Volume III of this EIAR.

The GQRA and WSC reports did not address works to be undertaken in conjunction with the proposed watermain upgrades as this area was not included in the scope of works for the environmental site investigation and environmental assessment information was not publicly available for this area.

5.2.3 Phase 2: Refinement of the Conceptual Site Model

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

5.2.4 Phase 2: Detailed Assessment and Impact Determination

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

The approach adopted is as per the IGI Guidelines (IGI, 2013) and each potential effect of the Emmet Road Part 10 Project and the associated watermain upgrade has been described in terms of Quality, Significance, Extent, Probability, and Duration. The classification of impacts/effects in this chapter follows the definitions provided in the EPA Guidelines (EPA, 2022).

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

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

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

Phase 3 builds on the outcome of the initial assessment and detailed site assessments by identifying mitigation measures to address the identified impacts. Mitigation measures which are known to be effective have been built into the project design have also been considered in this process.

The development, including all identified mitigation measures (assumed implemented), is then subject to impact assessment to identify any residual impacts.

The Final Impact Assessment presented in this Chapter incorporates the outputs from the Detailed Assessment and Impact Determination, Mitigation Measures, and Residual Impact Assessment and makes recommendations for monitoring of residual impacts, if required.

A “Do-Nothing” scenario is also considered whereby the natural evolution of the site and the associated environmental impacts are assessed in the absence of the proposed development.

5.2.6 Phase 4: Completion of the EIA Section

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

5.2.7 Assumptions and Limitations

The description of existing conditions is based on the available desk study, information supplied by the design team as outlined in Section 5.5, and a site investigation undertaken in 2020.

Effects are summarised using Table 3.3 of the EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, May 2022).

5.3 BASELINE SCENARIO (RECEIVING ENVIRONMENT)

The receiving environment is discussed in terms of geomorphology, superficial and solid geology, contamination, and hydrogeology. This Section and the accompanying Figures can be considered as the geo-environmental CSM for the project site. The zone of influence (ZOI) of site works based the maximum anticipated distance that the site works may be expected to impact surrounding features has been determined to be 0.5km for geological features given the lack of basements, the nature of the proposed works and assuming standard construction best practice and 1 km for hydrogeological features based on the lack of basements (and therefore minimal impact/impediment to groundwater flow) the nature of the proposed works and assuming standard construction methods in which the proposed development and watermains upgrade are located.

5.3.1 Sourcing Baseline Information

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

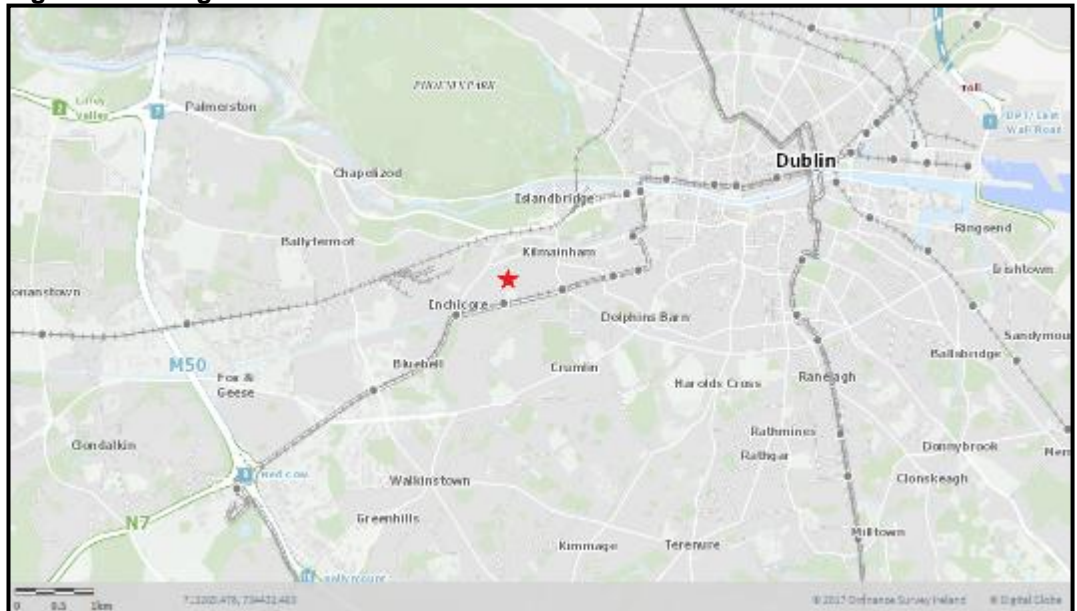
A full list of references is included in Section 5.15.

5.3.2 Topography & Setting

The topography of the site varies from 28.70m AOD in the southwest corner to 22.81m AOD in the northern end. Contour lines decrease from southwest to northeast. Topography along the line of the proposed watermain upgrade falls along Emmet Road to the west to its intersection with Tyrconnell Road.

The regional site location is illustrated in **Figure 5.1**.

Figure 5.1 – Regional Site Location



(Source: OSI)

As shown in **Figure 5.1**, the site’s surrounding area is urban in nature. North of the site are Emmet Road (R810), residential and commercial structures, Grattan Crescent Park and Richmond Park. East of the site is Patriots Path, St Michael’s Estate Road, Saint Michael’s Church, Bulfin Court Day Centre, residential buildings, Inchiore Primary Care Centre, and Richmond Barracks Cultural Centre with associated gardens and a vacant site. Further east are residential structures. South of the site are Goldenbridge Cemetery and the Common Ground Art building. Further south are the Grand Canal, the Luas Line transport link (red line), Davitt Road (R812) and residential buildings. West of the site are St. Vincent Street West, residential buildings, commercial businesses, and retail outlets.

Refer to **Figure 5.4** for an aerial photograph of the site. The adjacent land uses are listed in **Table 5.1**.

Table 5.1 – Adjacent Land Uses

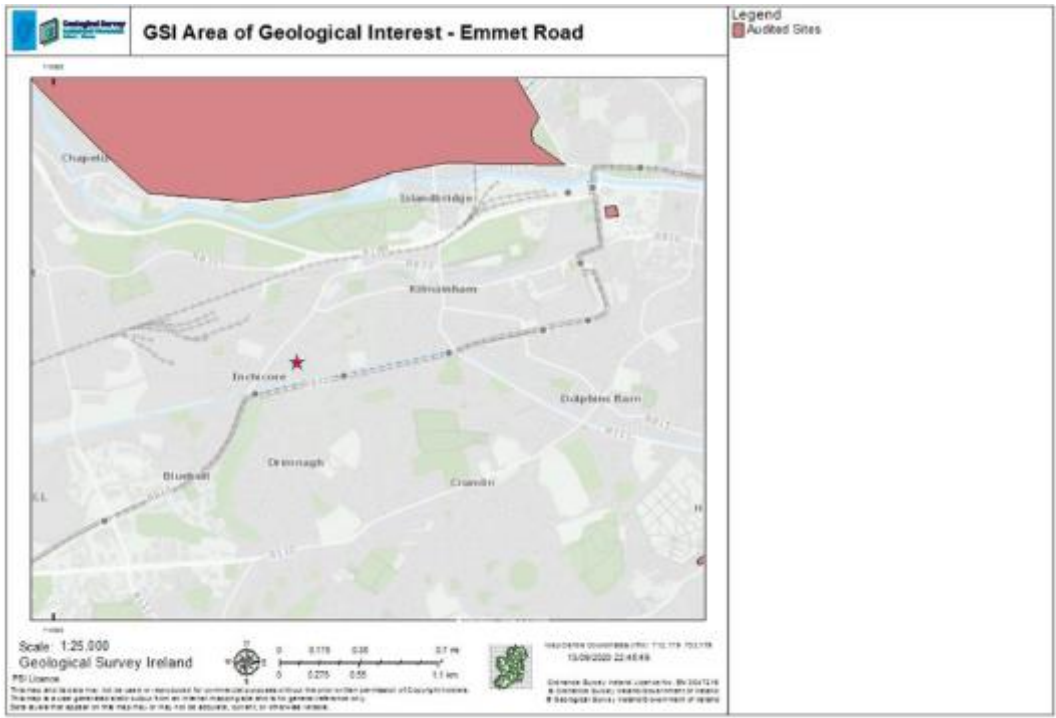
Boundary	Land Use
North	Emmet Road (R810), residential and commercial structures, Grattan Crescent Park and Richmond Park.
East	Patriots Path, St Michael’s Estate Road, Saint Michael’s Church, Bulfin Court Day Centre, residential buildings, Inchiore Primary Care Centre, Richmond Barracks Cultural Centre with associated gardens, a vacant site.
South	Goldenbridge Cemetery, Common Ground Art building, The Grand Canal, The Luas line transport link (red line), Davitt Road (812), residential buildings.
West	St. Vincent Street West, residential buildings, commercial and retail businesses.

5.3.3 Areas of Geological Interest & Historic Land-Use

GSI online mapping service was consulted regarding areas of geological interest in the area of the site. The nearest area of geological heritage is the Phoenix Park (site code DC009) which is located approximately 0.9 km north of the

site. The site comprises an extensive natural landscape spanning an area of 707 hectares (ha). The site is designated due to the complexity of the native glacial sediments. However, this feature lies outside the zone of influence for the site works with regard to geological features. Refer to **Figure 5.2** from the GSI online mapping for further information.

Figure 5.2 – Area of Geological Interest



(Source: GSI, 2021)

The site and area for the proposed watermain upgrades has undergone many changes in land use. The 6" historical map dated 1837-1842 (see **Figure 5.3**) shows the site as part of the western portion of the Richmond Barracks, a military complex inside the Goldenbridge North Townland. The site was comprised of building structures along the perimeter of the site with an open area in the centre. The location of Emmet Road to and including the junction of Tyrconnell Road followed the same line as the existing road network.

Figure 5.3 – Approximate Location of the proposed site (red line) on 1837-1842 6 Inch OS Map



(Source: OSI)

The 25" historical map dated 1888-1913 shows the site as largely unchanged from the previous mapping except for the construction of a number of small buildings along the northern and western boundaries of the site. Tramlines were noted along Emmet Road to the north of the site and as far west as the junction with Spa Road.

The 6" Cassini historical map identifies a change to the layout of Richmond Barracks with the removal of buildings along the northern and western boundaries of the site and the construction of a large building in the south-central portion of the site and Keogh Square in the north-central portion of the site. The tramlines along Emmet Road were no longer shown on the Cassini mapping.

Keogh Square was replaced with St Michaels Estate (residential) which was opened in 1969 and consisted of seven residential buildings and open areas within the site. Analysis of the OSI 2013 – 2018 aerial image (refer to **Figure 5.4**) shows the site in its current form with the St. Michaels estate fully demolished thereby leaving open space which remains now as a grass field. On the north of the site, the Inchicore Community Sports Centre was built, one of the northern buildings was partially demolished, and three others remain. The traveller accommodation is depicted as demolished.

Figure 5.4 – Approximate site boundary (red line) on the 2013-2018 aerial image

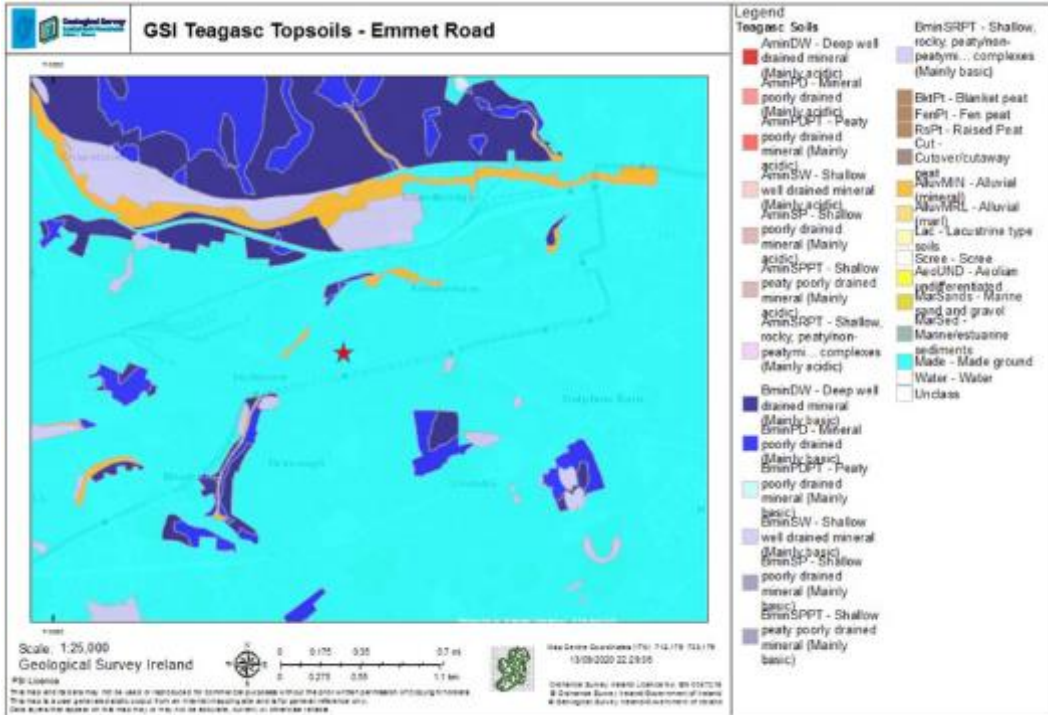


(Source: OSI)

5.3.4 Regional Soils

According to the Teagasc Soil Information System which is accessed through the GSI Geotechnical Data Viewer, the topsoil beneath the site, the area of the proposed watermain upgrade, and the surrounding area has been classified as made ground. This is expected given the urban nature of the site. The majority of central Dublin has had anthropogenic influence with made ground covering almost all of the city centre and stretching out to the suburbs. Refer to **Figure 5.5** from the GSI online mapping for further information.

Figure 5.5 – Teagasc Topsoils – location of site and watermain upgrades shown by red star



(GSI, 2021)

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

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

Dublin Boulder Clay has been extensively studied and there are many publications describing its properties. Additionally, there are numerous examples of deep excavations (up to 25m) and constructions within Dublin Boulder Clay (e.g. Dublin Port Tunnel, Trinity College Library and Leinster House). Data and case history from these sites have shown that the walls in Dublin Boulder Clay are very rigid due to the inherent natural strength and stiffness of the material and the slow dissipation of excavation-induced depressed pore pressure or suctions (Long et al, 2012).

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

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

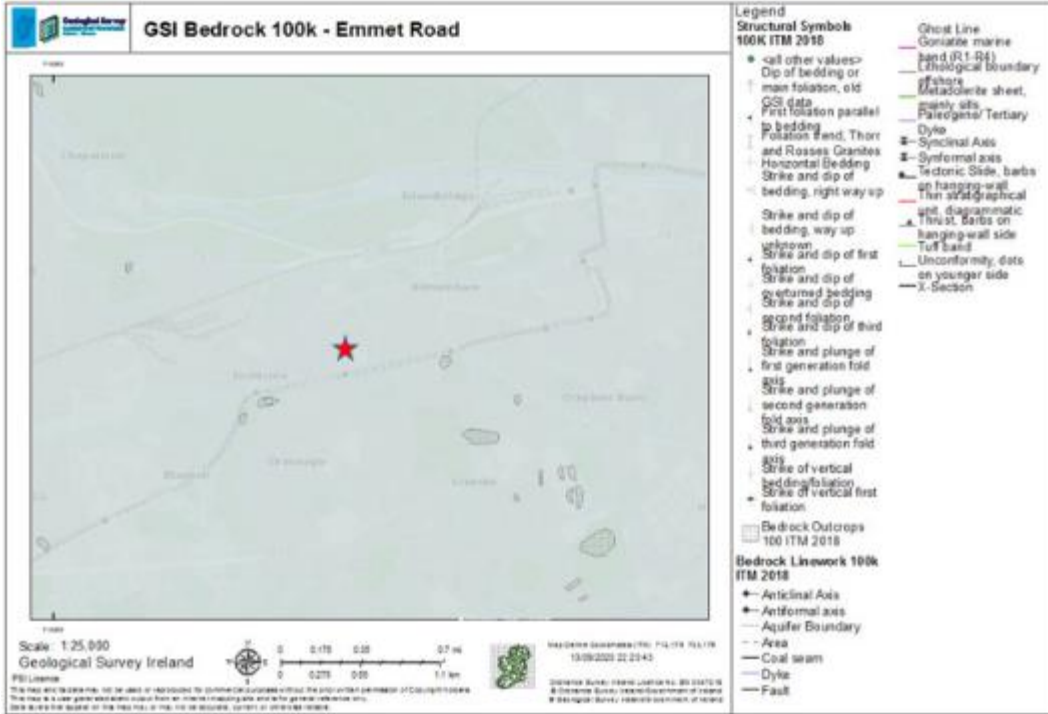
5.3.5 Regional Geology

The bedrock of the greater Dublin region consists of Dinantian Upper Impure Limestone which is part of the Lucan Formation. The limestone is colloquially known as Calp and is estimated to be up to 800m thick. The homogeneous

sequence has been described as dark grey to black limestone and shale. The homogeneous sequence consists of dark grey massive limestones, shaley limestones and massive mudstones. The average bed thickness is less than 1m, but these normally thin-bedded lithologies can reach thicknesses of 2m or more. The local bedrock geology mapped by the GSI is illustrated on **Figure 5.6**.

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

Figure 5.6 – Local Bedrock Geology – location of site and watermain upgrades shown by red star



5.3.6 Regional Hydrogeology

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

The Dublin Urban GWB comprises:

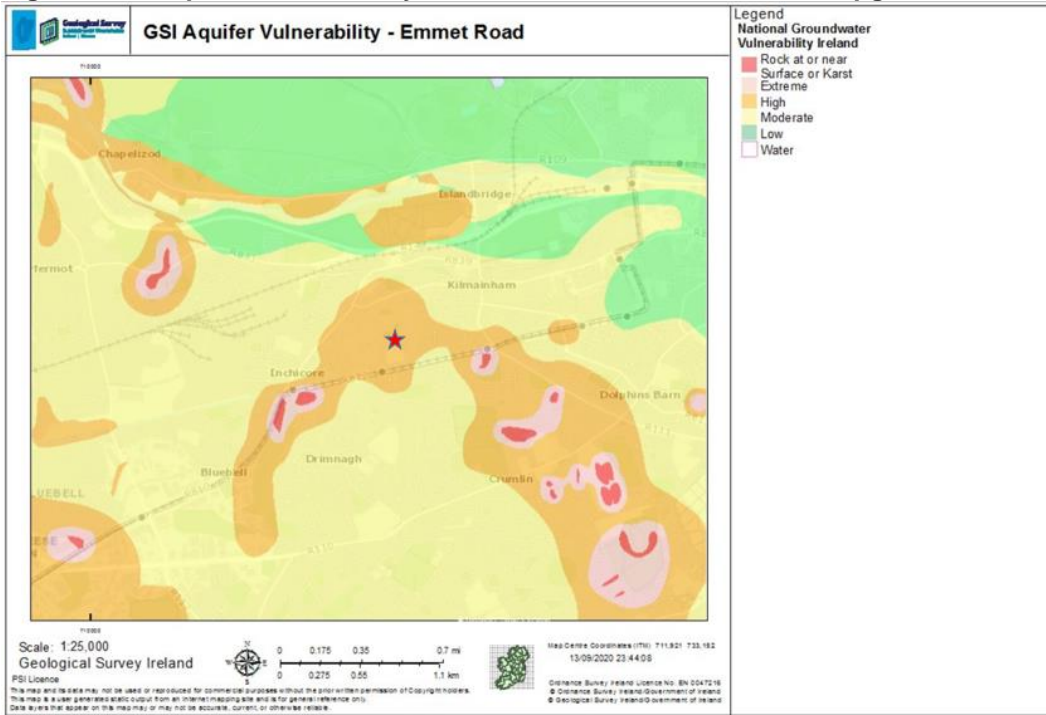
- LI: Locally important aquifer, moderately productive only in local zones, and;
- PI: Poor aquifer, generally unproductive except for local zones.

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

5.3.7 Groundwater Vulnerability

The groundwater vulnerability beneath the site and the area of the proposed watermain upgrade is **High**. There are localised areas of **Extreme** groundwater vulnerability within 0.6 km southeast and southwest of the site and watermain upgrade area (GSI, 2021); (see **Figure 5.7** (GSI, 2021)). Vulnerability ratings are related to a function of overburden thickness and permeability which might offer a degree of protection and/or attenuation to the underlying aquifer from surface activities and pollution. There were no karst features identified on or adjacent to the site or the watermain upgrade area.

Figure 5.7 – Aquifer Vulnerability – location of site and watermain upgrades shown by red star



5.3.8 Groundwater Status

An assessment carried out under the Water Framework Directive has concluded that the groundwater within the Dublin Urban GWB is presently of “Good status”. The objective is to protect the “Good status” by recognising that the quality of the groundwater in the 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.

5.3.9 Groundwater Recharge

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

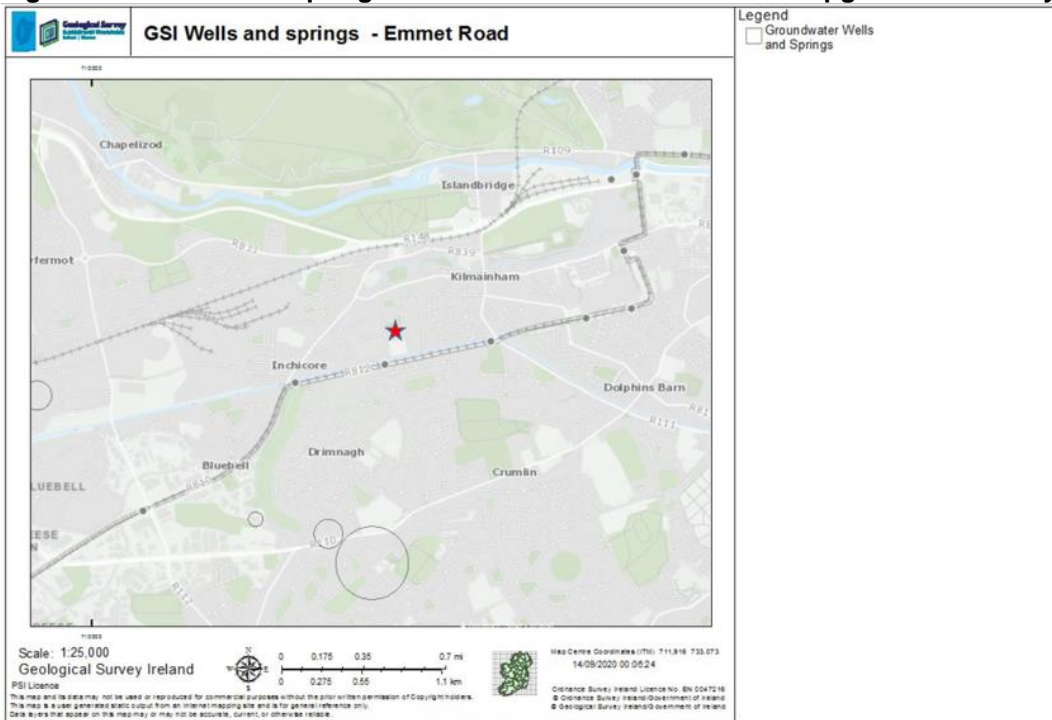
Based on the GSI website the effective rainfall in the vicinity of the site is 350mm/year. Recharge to the aquifer can only occur where rainfall can percolate through any subsoil to the aquifer. However, given the thickness of low permeability boulder clay, any water which percolates through the subsoil is likely to be perched on the significant thickness of Dublin Boulder Clay and consequently it is likely that recharge to the Lucan Formation is minimal to insignificant in the area surrounding the site. The GSI have designated that the recharge coefficient in the immediate

area of the site as 20%, likely due to the lenses of sand and gravels observed within the boulder clay. Based on the GSI’s Recharge Model, the total recharge would be equivalent to approximately 60mm/year.

5.3.10 Groundwater Abstractions

A search of the GSI groundwater well database was conducted to identify registered wells in the surrounding area. The nearest wells to the site are located approximately 1.3 km to the south and south-southwest of the site in Drimnagh, Dublin 12. The well to the south-southwest was drilled on January 4th, 1996, to a depth of 3.3 m for an unspecified use. The well to the south was drilled on August 1st, 1949, to 41.1 meters for industrial use. A third well was located 1.5km southwest of the site and was drilled on December 29th, 1899, to 42.7 meters for industrial use. None of these wells were within the ZOI of the site. Mapped wells and springs in the general vicinity of the site identified by the GSI are illustrated on **Figure 5.8**.

Figure 5.8 – Wells and Springs – location of site and watermain upgrades shown by red star



The GSI (1999) also provides a framework for the protection of groundwater source zones (SPZs) e.g., areas of contribution to water supply bores. There are no reported SPZs within the ZOI of the proposed site.

5.3.11 Radon

According to the EPA (now incorporating the Radiological Protection Institute of Ireland) between one and five per cent of the homes within the development area are estimated to be above the Reference Level of 200 Bq/m³. This is the second lowest classification; the lowest classification is for below one per cent of homes to be estimated to be above the Reference Level. A High Radon Area is any area where it is predicted that 10% or more of homes will exceed the Reference Level.

5.3.12 Local Soils & Geology

The site investigations undertaken in 2020 have proven the topsoil and subsoil formations for the proposed development site. The sequence of strata encountered was recorded from OCSC’s window sampling field observations, GII’s window sampling logs, GII’s trial pit logs, and GII’s borehole logs and is summarised in **Table 5.2**. An investigation of ground conditions in the area of the proposed watermain upgrades was not part of the scope of works for the 2020 soil investigation. However, as the area of the site and watermain upgrades were developed at the same time based on historical mapping, it can be assumed that the lithology within the area of the watermain upgrades is broadly similar to that identified on the development site.

Table 5.2 – Sequence of Strata

Measured thickness Range (m)	Strata	Description
0 to 3.2	Made Ground	MADE GROUND depths varied throughout the site. Some surface layers consisted of tarmac or concrete, while others consisted of grass and topsoil. Brown silty sandy gravelly CLAY fill with fragments of mortar, concrete, plastic, timber, glass, and bricks. Multiple brick building structures were observed at varying depths.
1.1 to 12.6	Native Material	Brown-dark brown firm sandy gravelly CLAY. Dark grey sandy gravelly CLAY with cobbles and boulders.
3.05 to 14.5	Bedrock	Bedrock was encountered at varying depths from 3.05mbgl to 12.6mbgl. Strong thinly laminated grey fined argillaceous LIMESTONE with occasional calcite veins interbedded with weak to medium strong thinly laminated black fine grained calcareous MUDSTONE with pyrite lamination.

5.3.13 Soils Contamination Assessment

The development site is considered to be a brownfield site given the historic site use. An assessment of soil contamination and a waste classification were carried out for this site. An assessment of soil contamination and a waste classification were not carried out for the area of the watermain upgrades due to the access issues related to conducting an investigation within busy urban roads. As such, waste soils generated during this phase of the project will require stockpiling and waste classification prior to off-site disposal as discussed in Section 5.8.2.3.

A total of 221No. soil samples were obtained across the development site as part of the intrusive site investigation phase (2020) and submitted for analysis to Element Laboratories, a UKAS accredited laboratory, and IOM. Additionally, the soil analytical data was compared with a set of Generic Assessment Criteria (GAC) for Residential Use without Plant Uptake, Commercial and Public Open Space (Residential) end use as detailed in OCSC Generic Quantitative Risk Assessment (GQRA) Report which is included in Appendix C, Volume 3 of this EIAR. The GACs are an extremely useful screening tool in the assessment of risks from land contamination. When used in conjunction with the CSM they can streamline the risk assessment process by reducing the number of contaminants or pollutant linkages requiring more detailed risk assessment and, in many cases, can help demonstrate that there are no unacceptable risks at a site. The risk to construction workers is not considered under the GAC methodology but will be addressed in the Construction Environmental Management Plan (CEMP) and health and safety documentation for the site. It is assumed that health and safety guidelines will be adhered to and appropriate health and safety planning/ assessments will be undertaken in advance of any on-site works.

In general, GACs are conservative screening criteria protective of human health. If the concentrations are below the GAC, then the risks to human health are considered negligible. If the concentrations are above the GAC, a potential risk to human health is identified and further assessment is required. The GACs are consistent with the principles of human health protection as detailed in Irish EPA, UK DEFRA, and UK Environment Agency guidance.

From the 221No. samples, GAC exceedances consisted mostly of Total Petroleum Hydrocarbons (TPH), Polycyclic Aromatic Hydrocarbons (PAHs) and some metals in the form of arsenic and lead. These exceedances were typically associated with land use in the 'residential' scenario.

Based on the existing information, there is no risk to future commercial or residential receptors following site development.

It is anticipated that a number of the pathways of concern such as direct contact from metals will be broken due to the site redevelopment i.e., breaking the pathway by capping the soils with buildings or hardstanding.

Ground gas assessment showed low levels of ground gases yielding a site characterisation of CS1 which has a hazard potential of Very Low.

Three samples were collected from groundwater monitoring wells. Groundwater results were compared against human health and environmental generic assessment criteria. One minor exceedance of Aliphatic TPH C10-12 was observed for human health risk assessment. This exceedance is considered to represent localised contamination from a historic oil tank and is not considered indicative of widespread contamination. Similarly, elevated concentrations of PAHs and arsenic exceeded the GACs values used to evaluate the groundwater quality. However, these are localised and not considered indicative of widespread contamination.

Refer to the GQRA (OCSC, 2020) for analytical soil and groundwater tabulated results contained in Appendix C Volume III of this EIAR.

5.3.14 Potential Pollutant Linkages – Development Site

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

A. Sources

- The potential contamination sources identified on site are any contaminants associated with made ground and the past/current site use including former military operations, fly tipped waste, former fuel storage tanks, previous construction and demolition works, former use as a halting site, and possible Asbestos Containing Materials (pACMs).
- There will be sources of potential contamination present on site during the construction phase (e.g. machinery oils, fuel, concrete, etc.).
- Run-off from construction sites can contain minor levels of pollutants (e.g. mineral oils) with high concentrations of suspended solids.
- Localised groundwater contamination.
- Piling in contaminated ground has the potential to transfer material from the upper layers of the ground to the deeper layers, and hence a risk assessment for the piling should be carried out;
- There will be no significant sources of potential contamination present on site during the operational phase of the development.

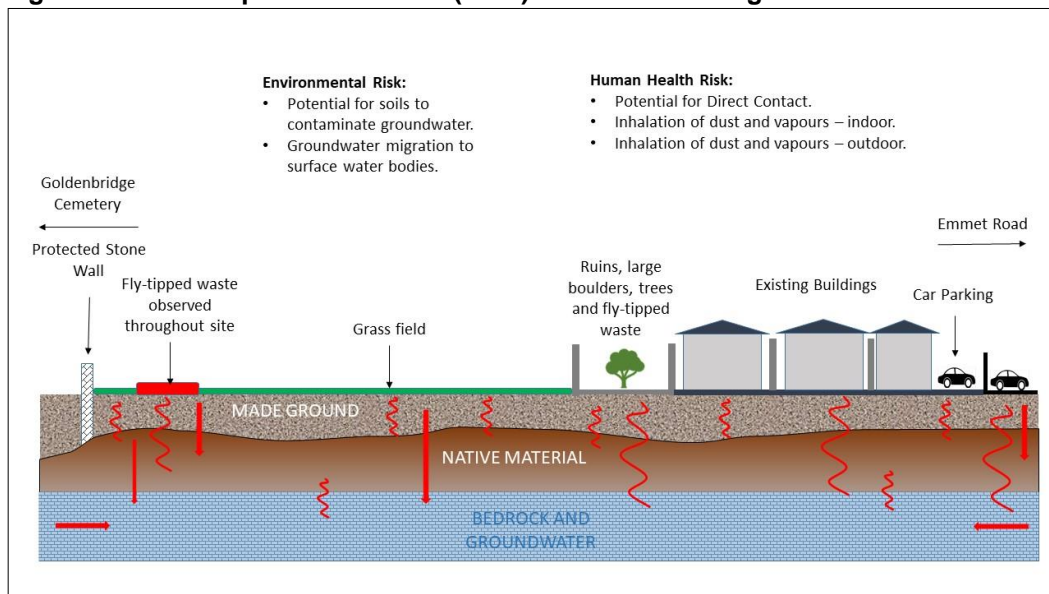
B. Receptors

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

C. Pathways

- Migration of volatile contaminants identified in soil and groundwater samples to indoor and outdoor air constitutes a potential pathway;
- Direct contact with soil contaminants constitutes a potential pathway;
- Migration of contaminants from surface spills to land, soils, geology, groundwater or surface water constitutes a potential pathway;
- Migration of contaminated run-off (e.g. during construction phase or operational phase) to groundwater, surface water or surrounding geology constitutes a potential pathway.

Figure 5.9 – Conceptual Site Model (CSM) based on existing site conditions



Potential Pollutant Linkages

An environmental risk is only present when a pathway links a source with a receptor. The potential pollutant linkage CSM for the development is summarised in **Table 5.3** and is based on current site conditions prior to mitigation measures such as contamination source removal through excavation and off-site disposal of impacted soils, implementation of engineering mitigation measures such as radon barriers, and capping of the land surface with buildings and hard and soft landscaping. It should be noted though that this CSM represents a hypothetical situation where residential site users are present in a site which has not undergone mitigation.

Table 5.3 – Conceptual Site Model (CSM) Pollutant Linkages Geology and Groundwater

Source	Pathway	Receptors	Potential Pollutant Linkage (Y/N)	Potential Impact
Soil contaminants identified on site	Inhalation of volatile contaminants	Residential site users	Y	Negative, moderate, and long-term
Soil contaminants identified on site	Dermal contact, ingestion, inhalation of particulates	Residential site users	Y	Negative, moderate, and long-term
Groundwater contaminants identified on site	Inhalation of volatile contaminants	Residential site users	Y	Negative, slight to moderate, and long-term
Radon	Inhalation of radon	Residential site users	Y	Negative, slight to moderate, and long-term
Deleterious materials stored on site during construction	Migration of surface spills/ contaminated run-off	Surrounding Land/Soils or Groundwater in the bedrock aquifer	Y	Negative, slight to moderate, and short-term
Contaminated run-off from construction activities			Y	Negative, slight to moderate, and temporary

Source	Pathway	Receptors	Potential Pollutant Linkage (Y/N)	Potential Impact
Deleterious materials stored on site during construction	Migration of surface spills/ contaminated run-off	Potential water bodies: Grand Canal 120m south; Camac River 85m northwest	N	Negative, not significant, and short-term
Contaminated run-off from construction activities			N	Negative, not significant, and temporary
Contaminated groundwater from the groundwater dewatering scheme	Discharge into the public sewer	Nearby public sewers	Y	Negative, slight, and temporary
Piling through contaminated ground	Migration of contamination from the upper soils to the lower 'clean' soil	Limestone Bedrock	Y	Negative, slight to moderate, and temporary

5.3.15 Potential Pollutant Linkages – Proposed Watermain Upgrade Area

The potential sources of contamination, migration pathways it may follow, and the receptors it could impact within the proposed watermain upgrade area are discussed below. If complete source-pathway-receptor scenarios exist, then there is a potential pollutant linkage that needs to be characterised and assessed (via formal risk assessment). All three elements need to be present for a viable risk to exist (e.g. if a source and receptor exist but no pathway is present, then there is no pollutant linkage and hence no risk).

A. Sources

- The potential contamination sources identified on site are any contaminants associated with the past/current site use as a roadway and tram line.
- There will be sources of potential contamination present on site during the construction phase (e.g. machinery oils, fuel, etc.).
- Run-off from construction sites can contain minor levels of pollutants (e.g. mineral oils) with high concentrations of suspended solids.
- Localised groundwater contamination.
- Sources of potential contamination present within the watermain upgrade area during the operational phase are those associated with the use of this land as a roadway.

B. Receptors

- The bedrock aquifer constitutes a potential receptor;
- The surface water bodies in the area surrounding the site constitute receptors.

C. Pathways

- Migration of possible volatile contaminants in soil and groundwater outdoor air constitutes a potential pathway;
- Migration of contaminants from surface spills to land, soils, geology, groundwater or surface water via drainage systems constitutes a potential pathway;
- Migration of contaminated run-off (e.g. during construction phase or operational phase) to groundwater, surface water or surrounding geology constitutes a potential pathway.

Potential Pollutant Linkages

An environmental risk is only present when a pathway links a source with a receptor. The potential pollutant linkage CSM for the development is summarised in **Table 5.4**:

Table 5.4 – Conceptual Site Model (CSM) Pollutant Linkages Geology and Groundwater

Source	Pathway	Receptors	Potential Pollutant Linkage (Y/N)	Potential Impact
Potential soil contaminants on site	Dermal contact, ingestion, inhalation of particulates	Construction workers	Y	Negative, slight to moderate, and temporary
Groundwater contaminants identified on site	Inhalation of volatile contaminants	Construction workers	N	Negative, not significant, and temporary
Deleterious materials stored on site during construction	Migration of surface spills/ contaminated run-off	Surrounding Land/Soils or Groundwater in the bedrock aquifer	Y	Negative, slight to moderate, and temporary
Contaminated run-off from construction activities			Y	Negative, slight to moderate, and temporary
Deleterious materials stored on site during construction	Migration of surface spills/ contaminated run-off	Potential water bodies: Grand Canal 430m south; Camac River 0m (crossing) the work area	Y	Negative, moderate, and temporary
Contaminated run-off from construction activities			Y	Negative, moderate, and short-term

5.3.16 Summary & Type of Geological/Hydrogeological Environment

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

A summary of the site geology is outlined thus:

- The development site and proposed watermain upgrade area are essentially a brownfield site with previous military and residential land use and transport infrastructure use, respectively; The majority of the site is underlain by made ground;
- The subsoils predominantly comprised of glacial till consisting of fine to coarse sandy Gravel within a matrix of Sandy Gravelly Clay (Dublin Boulder Clay);
- Bedrock was encountered at varying depths from 3.05mbgl to 12.6mbgl and was comprised of strong, thinly laminated, grey, fine grained, argillaceous LIMESTONE with occasional calcite veins interbedded with weak to medium strong, thinly laminated, black, fine-grained calcareous MUDSTONE with pyrite lamination.
- The only known potential contamination sources on the development site are any contaminants within the material associated with the past/current site use, former military operations, former fuel storage tanks, construction and demolition works, and possible Asbestos Containing Materials (pACMs). The risks associated with this contamination has been assessed in the OCSC GQRA (2022).

- Potential contamination sources associated with the watermain upgrade area are contaminants associated with transport infrastructure, primarily petroleum hydrocarbons. It is not considered that these represent any particular increased risk to land or soils or hydrology. Solely this material will need to be managed in accordance with all relevant waste management legislation if requiring offsite disposal.
- Potential pollutant linkages associated with the development site and the watermain upgrade area were identified in **Tables 5.3 and 5.4**, respectively. However, provided the mitigation measures inherent in the design and included in the Construction and Environmental Management Plan (CEMP) as discussed further in Section 5.8 are implemented, the pollution risk will be reduced to an insignificant level.

5.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The description of the proposed development and the consideration of alternatives is detailed in Chapter 2. The study area for this assessment chapter includes the site and a 0.5km radius for potential geological impacts and a 1km radius for potential hydrogeological impacts from the site as discussed in Section 5.4. The site is located in Inchicore adjacent to various recreational, retail, residential and commercial facilities.

Further information regarding the proposed infrastructure elements of the proposed development is detailed in the separate Engineering Services Report prepared by OCSC.

Figure 5.10 – Aerial image of the site

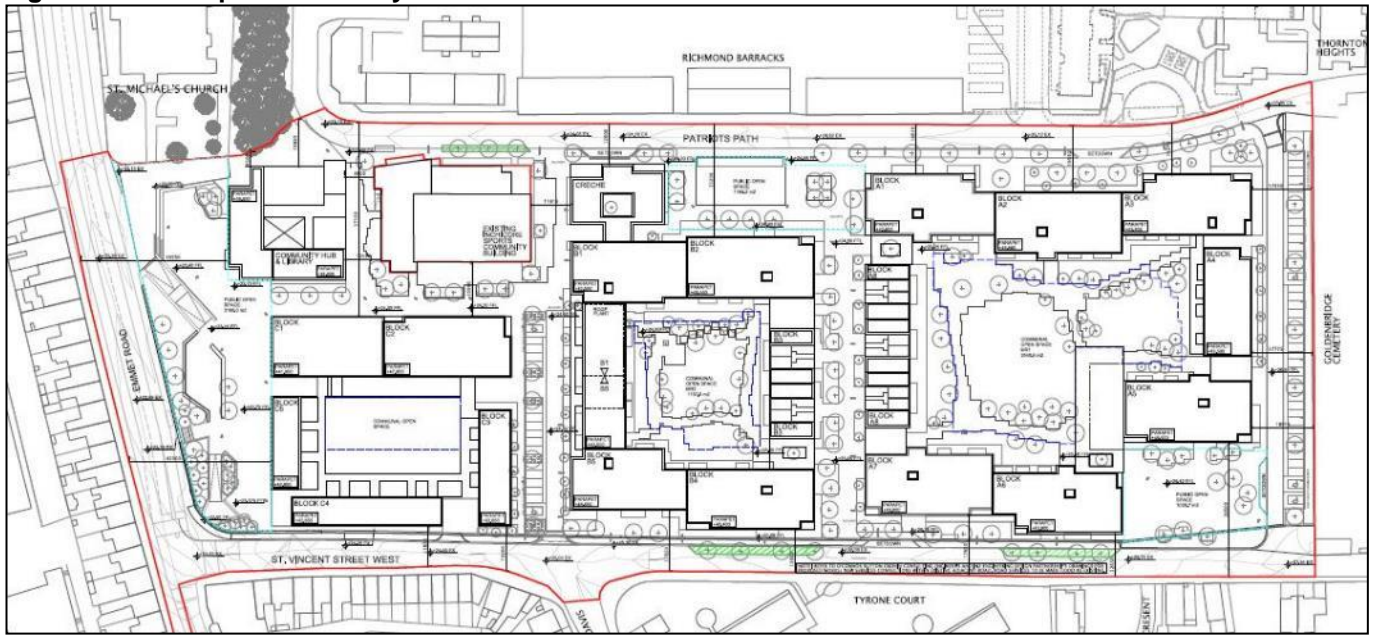


Red line is site boundary (Source: Google Earth)

The proposed development includes a mixed used development of 578 no. apartments in addition to commercial, retail and community facilities and associated infrastructure, including roads, footpaths, services and landscaping as shown in Figure 5.10. A basement is not proposed as part of the development works although an approximately 530m², full-storey height area of below ground plant space is proposed for the development.

The central and southern area of the site consists of the former St. Michael's Estate (Dublin City Council Social Housing) which has been demolished and exists now as open space. The northern section of the site consists of a number of structures that will be demolished, including St. Michael's Community Centre and the EVE Tuiscint Health Centre, under a separate Part 8 planning application. Another building, the Celtic Pigeon Club, was located on the northern section of the site but was demolished in November 2020. The Inchicore Community Sports Centre does not form part of the planning application. The current proposed site layout is shown in Figure 5.11.

Figure 5.11 – Proposed Site Layout



(Source: Bucholz McEvoy Architects)

The development will require the excavation of soils and removal of soils from site as part of the design. In addition, groundwater chemistry results indicate that groundwater extracted as part of construction phase dewatering may require on-site pre-treatment of prior to discharge to sewer. This will be confirmed by the appointed dewatering contractor. Any water discharged to the public sewer will be monitored frequently to ensure it meet the limits stipulated by the discharge licence. In light of these activities, the proposed development will have a permanent, slight positive impact on the land, soils, and hydrogeology beneath and surrounding the site area due to the removal of contamination source material within made ground and groundwater during construction.

The activities associated with the project which have the potential for impact are detailed in **Table 5.5**.

5.4.1 Project Phases / Lifecycle

The commercial phase of the development will be delivered separate to the residential phase. The watermain upgrade on Emmet Road will be undertaken as a separate phase to development works.

5.4.2 Characteristics of the Watermain Upgrade

It is proposed that all watermain connections for the proposed development be from the existing 150mm diameter main along St. Vincent Street West. A pre-connection enquiry has been submitted to Irish Water and a Confirmation of Feasibility subject to upgrades has been received. It is required that an approximate 180m length of the 6-inch watermain along Emmet Road be upgraded to a 200mm diameter pipe to facilitate the proposed development. While a site investigation and risk assessment of potential soil contaminants have not been undertaken in this area, it is anticipated that the removal and of-site disposal of soils associated with this phase of works have a permanent, slight positive or neutral impact on the land, soils, and hydrogeology within this area depending on the level of contamination identified at the time of site works within the site which is located immediately to the south of the watermain upgrade. The current proposed location for the watermain upgrade is shown below.

Figure 5.12 – Proposed Watermain Upgrade



Red line of watermain upgrade on Emmet Road shown relative to the red line of the proposed development site (Source: Bucholz McEvoy Architects)

The activities associated with the proposed development at the site and the works associated with the watermain upgrade which have the potential for impact are detailed in **Table 5.5**.

Table 5.5 – Development Site and Watermain Upgrade Activities Summary

Phase	Activity	Description
Construction	Discharge to Ground	Run-off percolating to ground at the construction development site and the watermain upgrade site.
	Earthworks: Excavation of Superficial Deposits	Limited excavation will take place for the provision of building foundations, lower ground floor plant space and services and for the installation of piles, if required at the development site and for the provision of watermain upgrades and connections on the Emmet Road site.
	Storage of hazardous Material	Fuel for re-fuelling on-site machines and chemical storage (such as for concrete curing) during the construction phase on both sites.
	Import/Export of Materials	All suitable surplus subsoil, if any exists, will be exported for reuse off site where a suitable reuse site can be identified. Soil reuse will be subject to the requirements under the Waste Management Act (e.g. Article 27 or 28). Where material cannot be reused it will be recovered or disposed of in accordance with the Waste Hierarchy and Waste Management Act. Aggregates will be required for sub-base under roads and buildings on the development site and for backfill and sub-base under roads on the watermain upgrade site. All sub-base materials must meet the relevant engineering specifications. The use of recycled or secondary aggregates should be considered as a replacement for primary aggregates.
	Construction of sub-surface structures	A basement will not be excavated, although a small area of underground plant space is proposed. Due to its size, it is unlikely that this will be an impediment to groundwater flow.

Phase	Activity	Description
Construction and Operation	Infilling	A degree of fill will be required during the works which will include the importation of concrete and stone. Construction materials which contain recycled/recovered content should be considered as part of the procurement stage.
	Drainage Works	Altering of groundwater/surface water regime by drainage, increasing hard standing area.
Operation /unplanned events	Storage of hazardous Material	No fuel oil storage will be required for operational phase. There are no proposals to connect to the gas supply to serve the development as the development will be heated with air source heat pumps.

As outlined in Table 5.5, the Construction Phase holds the highest number of activities which could potentially impact on the geological and hydrogeological environment. The operational phase of the project has very few if no activities which would constitute a risk to the soil, geological, and/or hydrogeological environment.

5.5 POTENTIAL IMPACTS EFFECTS OF THE PROPOSED DEVELOPMENT AND WATERMAIN UPGRADE

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

- Land take in the case of the proposed development – change of use from greenfield/brownfield to mixed use/commercial. However, this constitutes a return to previous residential land use.
- Soil excavation for both the proposed development and the watermain upgrade.
- Accidental spills, contaminated run-off, and/or contaminated groundwater discharged to sewer during the construction phase on both sites as well as piling on the development site have the potential to have an impact on the land and the geological and hydrogeological environments.

5.5.1 Construction Phase

In line with EIA guidance, each potential impact for the development should be described in terms of its Quality, Significance, Extent, Probability, and Duration. The potential impacts are outlined below. These impacts also relate to and interact with other chapters within the EIAR specifically:

- Chapter 3, Population & Human Health
- Chapter 4, Biodiversity
- Chapter 6, Hydrology & Water
- Chapter 7, Air Quality & Climate
- Chapter 8, Noise and Vibration
- Chapter 10, Material Assets: Traffic
- Chapter 12, Material Assets: Utilities
- Chapter 13 & 14, Cultural Heritage/Built Heritage

5.5.1.1 Watermain Upgrade

The proposed development requires an upgrade of the watermain in Emmet Road to a 200mm diameter main as well as some diversions of existing live mains crossing the site. These works involve physical works to existing watermains serving both the local and wider area and as such have the potential to lead to a temporary loss in service if not undertaken correctly. Other potential impacts associated with this phase of work include those associated with the construction phase of the proposed development including excavation of soils, construction and public traffic management, the potential for accidental spills and leaks as discussed in the following sections.

5.5.1.2 Excavation Works

Topsoil

Removal of the existing topsoil layer will be required across the development site. It is expected that a portion of the stripped topsoil will be reused on site for landscaping of public open spaces, if suitable for reuse.

Stripping of topsoil will result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion and generation of sediment laden runoff which, if unmitigated, may pose a temporary, negative, slight to moderate effect.

The removal of surface soils will involve segregation and off-site disposal of contaminated soils which pose a potential positive impact to human health or the environment based on the GQRA. The removal of these materials will therefore have a permanent, slight to moderate, positive impact with regard to human health and geological and hydrogeological receptors.

Although the site is located in an area of low radon risk, the removal of soils to facilitate construction on the development site may slightly increase the impact related to radon on the site thereby creating a permanent, slight, negative effect.

5.5.1.3 Subsoil Layers

Excavation of existing subsoil layers will be required to allow road construction, foundation excavation, drainage and utility installation, and provision of surface water attenuation facilities in the development site as well as watermain upgrades and connections on the Emmet Road site. These will have a short-term, negative, slight effect due to the temporary exposure of sub soil layers during construction which may result in erosion and generation of dust and sediment laden runoff.

Soil compaction may occur due to movement of construction and maintenance traffic on the development site. This is considered to be a permanent, slight, negative impact on the soil and in-situ earth materials.

Where feasible, excavated material will be reused as part of the site development works (e.g., use as fill material beneath houses and roads). However, surplus soils will require off-site disposal at appropriate disposal facilities.

Estimated bulk excavation volumes for the development are estimated at 35,000m³ as shown in **Table 5.6**.

Table 5.6 – Estimated Bulk Excavation Volumes

	TOTAL	Apartments	Creche	Tranche 5	Undercroft	Library	Site Works
Bulk Excavation							
Pile arisings	7,603	4,967	196	488	1,476	476	n/a
Reduced level	18,761	4,922	302	364	926	617	11,630
Reduced level (below ground plant space)	1,815	1,815	n/a	n/a	n/a	n/a	n/a
Trenches	3,278	2,108	124	167	455	424	n/a
Pile caps	3,832	2,665	76	279	796	16	n/a
TOTAL	35,289						

5.5.1.4 Construction Traffic

Excess topsoil and subsoil not required for landscaping and fill material will be removed off-site to registered facilities for disposal or recovery. It will also be necessary to import materials to site, in particular large volumes of stone for construction of the roads, foundations and services. Large quantities of concrete, bricks, steel, tar, windows, fittings, pipes, materials, etc. will also be mainly delivered to site by lorry. These imports and exports of materials along with the commuting of workers to site will generate a large amount of construction vehicle trips on the road network in the local area during the construction phase of the works. The potential impact of construction traffic will be a not significant, negative effect over the duration of the construction programme. Refer to Chapter 10 Material Assets: Traffic for a table of effects and further details and information on the traffic impacts.

Earthworks plant within the site and vehicles removing soils from the site and delivering construction materials to site have the potential to cause rutting and deterioration of the topsoil layer and any exposed subsoil layers resulting in erosion and generation of sediment laden runoff. This issue can be particularly noticeable at site access points where sediment laden run-off and mud may be deposited on adjacent roads by construction vehicles. Dust generation can

also occur during extended dry weather periods due to on-site excavation works and construction traffic. These activities will have a short-term, slight, negative impact on the geological environment on the site.

5.5.1.5 Accidental Spills and Leaks

During the construction phase there is a risk of accidental pollution related to the following construction activities:

- storage of oils and fuels on site,
- oils and fuels leaking from construction machinery,
- spillage during refuelling and maintenance of construction machinery,
- use of cement and concrete during construction works, and
- wastewater from poorly maintained site toilets and washrooms.

Potential accidental spills and leaks could cause contamination of the existing topsoil, subsoils, or bedrock underlying the site causing a negative, moderate, permanent impact on the geological environment on the site.

There is a potential risk of localised contamination of the groundwater due to construction activities i.e., from accidental spillages, leaks etc. resulting in a potential long-term, negative, significant effect on the groundwater (in the absence of mitigation).

5.5.1.6 Discharge to Public Sewers

Limited dewatering of excavations from ingress of rainwater or groundwater may be required to facilitate construction of subsurface structures on the site. A dewatering contractor will be appointed and supplied with the lab analyses of the groundwater samples to allow design of a pre-treatment system, if necessary. Only groundwater which meets the discharge licence conditions will be discharged into the public sewer in accordance with all conditions of the discharge licence resulting in a short-term, negative, slight impact related to this activity.

5.5.1.7 Filling and Capping of Site Soils

The construction of the proposed buildings and associated internal roads, footpaths, and hard standing will require the placement of imported fill and aggregates sub-base purposes and the capping of the soil on the development site with buildings, hard standing and soft landscaping. Non-compliant fill materials could introduce contamination onto the site and cause a permanent, slight to moderate negative impact to site geology and hydrogeology.

Capping of the ground surface can impact on natural exchanges occurring between soils and the atmosphere which influence the natural function and associated biodiversity of soils. This will have a negative, slight, permanent impact on the soil. However, capping of soils will result in a decreased risk of exposure by site users to potentially impacted soils via direct contact and inhalation and ingestion of soil particles thereby creating a positive, slight to moderate, permanent impact on human health.

5.5.1.8 Geological Environment

It is not envisaged that the proposed development will have any discernible negative effect on the geological environment. Excavations associated with development of the site have been designed as shallow as possible and are located above bedrock level. These potential effects can be characterised as not significant, neutral, and permanent.

Below is the summary of the potential impacts and interactions throughout the construction stage:

- Excavated and stripped soil can be disturbed and eroded by site vehicles during the construction phase. Rainfall and wind can also impact on non-vegetated/uncovered areas within the excavation or where soil is stockpiled. This can lead to run-off with high suspended solid content which can impact on water bodies. The potential risk from this indirect impact to water bodies and/or habitats from contaminated water would depend on the magnitude and duration of any water quality impact.
- There is a potential for dust from excavations or stockpiles to impact on air quality. This is discussed further in Chapter 7 Air Quality and Climate.
- Construction phase dewatering may be required to maintain dry working conditions in the excavations due to rainfall and potential groundwater ingress. Pumped water will require discharge offsite to the public sewer under a discharge licence.

- The import and export of material to and from the site during the construction phase as part of excavation or infilling works and movement of building materials and workers to site will have implications for traffic in the surrounding road network. These impacts are considered further in Chapter 10, Material Assets: Traffic.
- Capping of portions of the site will have implications for groundwater recharge.
- A number of areas of archaeological interest in the form of protected structures have been identified within the vicinity of the site and are discussed in detail in Chapter 13 and 14, Cultural Heritage/ Built Heritage.
- As with all construction projects, there is potential for water (surface water and/or groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a significant, short-term risk to groundwater quality for the duration of the construction if contaminated water is allowed to percolate to the aquifer. The potential main contaminants include:
 - Suspended solids (muddy water with increased turbidity) – arising from excavation and ground disturbance;
 - Cement/concrete (increase turbidity and pH) – arising from construction materials;
 - Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage and contaminated groundwater within the site from previous site activities;
 - Wastewater (nutrient and microbial rich) – arising from poor on-site toilet and washrooms.

5.5.2 Operational Phase

On completion of the construction phase, it is not envisaged that there would be further direct or indirect effects on the existing soils or geology on the site. Soft landscaping, road surfaces, buildings, and hard landscaping areas within the development will protect the soils from exposure and erosion. While the site development will result in an increase in impermeable surface area, the type of development (residential) and the use of properly designed and constructed hard landscaping, site services, and stormwater collection will prevent concentrated run-off from eroding existing soils and causing contamination.

Run-off from the development's impermeable areas is designed to be collected via a new stormwater network which incorporates in-line attenuation storage systems and SuDS features such as permeable paving, bio-retention areas, swales, and tree pits to improve water quality in accordance with the principles of SuDS design. The risk of impact to soils from infiltration by accidental spills or leaks of fuels and oils from vehicles on the site will be mitigated by the collection and treatment of run-off by the stormwater network / SUDS features. These Sustainable Urban Drainage systems, gullies, and interceptors will be maintained to ensure they remain in good working order. Chapter 6, Hydrology and Water provides further details regarding the strategy in relation to the development's stormwater management. Any potential impact by run-off on the quality of site soils and groundwater during the operational phase is considered negative, unlikely, and not significant.

Due to the increase in hard standing on the site and the collection of operational run-off into concentrated locations, stormwater infiltration across the site i.e., the “*greenfield*” infiltration potential, will be reduced. This impact is predicted to be negative, moderate, and permanent.

There is no requirement for any fuel oil stores and no proposals to connect to the gas supply network as the development will be heated by air source heat pumps.

5.5.2.1 Risks to Human Health

Potential risks to human health due to contaminants identified on the development site include direct contact with or ingestion or inhalation of contaminated soils by construction workers or other site personnel (e.g., construction workers exposed to dust generated by the construction activities within the site which may expose soils in dry weather to wind). Further risks to human health include exposure to hazardous materials due to accidental spills or leaks of hydrocarbons, fuels, or other construction-related chemicals.

Risks to human health relating to existing contamination identified on the site have been assessed by OCSC in a Generic Quantitative Risk Assessment (GQRA). This assessment identified limited areas of contamination which may pose a localised but significant risk to site end users if unmitigated. These potential effects can be characterised

as negative, slight, and short-term for construction workers and long-term for future residents in the absence of mitigation. Further information is included in Chapter 3: Population & Human Health.

5.6 MITIGATION MEASURES

This section describes a range of recommendations and mitigation measures designed to avoid, reduce, or offset any potential adverse geological impacts identified. The potential impacts, mitigation measures, and resulting residual impacts have been combined in **Table 5.11** Detailed Impact Assessment in presented at the end of Section 5.9 and are outlined below.

5.6.1 Incorporated Design Mitigation

To reduce the impact of the development on the lands and soils of the site, the proposed design will be optimised to minimise the required excavation, and thereby reduce the volume of soils exported off-site, the volume of materials imported to the site, and machinery operation time. It is proposed that where soils are to be exported off-site, a local facility will be chosen where feasible to reduce the carbon footprint associated with the transport and handling of the material.

Mitigation in the design of the proposed development also includes:

- Design of the proposed development levels to minimise cut/fill type earthworks and the volume of material to be disposed off-site where possible.
- Design of landscaping works for the development to protect the soils again from weathering and erosion.
- Design of site services / drainage works in accordance with the relevant design guidance such as the GSDSDS, The SUDS Manual (CIRIA C753), and the Irish Water Code of Practice (IW-CDS-5030-03 Revision 2).
- Removal of excavated material off-site and disposal in accordance with all applicable waste transport and disposal requirements.
- Appropriate design of site services / drainage / sewers incorporating features such as a light liquids separator or SuDS treatment train approach to protect the soils and geology from risk of contamination arising from the development.
- Appropriate measures against radon will be taken at detailed design stage.

5.6.2 Construction Phase Mitigation

To reduce the impacts on the soils, geology, and hydrogeological environment, a number of mitigation measures will be adopted as part of the construction works on site. The measures will address the main activities of potential impact which include:

- Surveying of watermains prior to upgrades and testing prior to commissioning.
- Control of soil excavation and export from site;
- Sources of fill and aggregates for the project;
- Fuel and chemical handling, transport, and storage; and
- Control of water during construction.

A CEMP is included with the planning application and includes a range of site-specific mitigation measures relating to soils. In advance of work starting on site, the works Contractor will develop the site-specific CEMP which sets out the overarching vision of how the construction of the project will be managed in a safe and organised manner by the Contractor with the oversight of the Developer. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures contained in this EIAR and any subsequent conditions relevant to the project as stipulated by An Bord Pleanála.

5.6.2.1 Management of Watermain Upgrades

Full and detailed surveys of the existing watermains to be upgraded, diverted, or removed will be undertaken in advance of the works with works appropriately planned and sequenced to ensure that risk of any temporary loss of supply to local residents is negated. The watermains will be tested according to the requirements of Irish Water prior to commissioning. Compliance with the conditions of the connection application will effectively mitigate potential risks

to the public watermains network while compliance with the CEMP will mitigate potential risks associated with the construction activity such that the impact associated with these works will be negative, temporary, and not significant.

Control of Soil Excavation

Soil stripping; excavation to facilitate the foundations and the construction of a new sewer and water mains connections, roadways, and all other associated services earthworks; and stockpiling of soil will be carried out during the construction phase on the development site. Soil stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated through the implementation of an appropriate earthworks handling protocol during construction:

- Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development and located so as not to necessitate double handling.
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter watercourses. It is anticipated that stockpiles will be formed within the boundary of the excavation and there will be no direct link or pathway from this area to any surface water body.
- It is anticipated that only local/low level of stockpiling will occur as the bulk of the material will be excavated either straight into trucks for transport off site or will be reused in other areas of the site as fill.
- Excavated soils will be segregated according to contamination level to ensure the removal from site of those materials which pose a risk to human health or the environment and that cross-contamination of materials does not occur.
- The project will incorporate the 'reduce, reuse, and recycle' approach in terms of soil excavations on site. The construction will be carefully planned to ensure only required volumes of soil will be excavated with as much material left in situ as possible. All excavated arisings will be reused on site where possible/if suitable in landscaping and public open spaces, for backfill to trenches under non-trafficked areas, etc.
- Where bedrock / boulders are encountered in excavations, crushing and reuse will be considered depending on the quantity of material excavated. Screened material may be reused as a fill material e.g., in road construction and backfill to service trenches.
- Stockpiles of excavated subsoil material to be protected for the duration of the works and located separate to the topsoil stockpiles.
- Disturbed subsoil layers to be stabilised as soon as practicable - backfilling of service trenches, construction of road capping layers, construction of building foundations, and completion of landscaping are to be carried out promptly to minimise the duration that subsoil layers are exposed to the effects of weather and construction vehicles.
- Dust suppression measures (e.g. damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment are free of nuisance dust and dirt on roads. Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes on the site.

The undertaking of soil excavation and soil handling on the development and watermains upgrade sites in compliance with the CEMP will mitigate potential risks associated with these activities such that the impact associated with these works will be neutral, temporary, and not significant.

Export of Material from Site

Where material cannot be reused on site, it will be sent for recovery/disposal at an appropriately permitted/licensed site. Further details will be included in the CEMP and the Construction and Demolition Waste Management Plan which provide mitigation for Chapter 11 Material Assets – Waste Management.

Site investigations on the development site have established that there is contamination present on site consisting of inert, non-hazardous, and hazardous materials. The standalone OCSC Waste Soil Classification Report (OCSC, 2020) contained in Appendix C Volume III of this EIAR includes details on the Waste Soil Classification assessment completed for the site.

All material removed from site will be classified before removal to ensure it is disposed of to an appropriately licensed landfill or recovery facility in accordance with The Waste Management (Hazardous Waste) Regulations 1998. Nonetheless, material which is exported from site, if not correctly managed or handled, could negatively impact human beings as well as water and soil environments. Additional Soil Classification will be undertaken as part of the

site development and the watermains upgrade work, and control of any material will be carried out in accordance with the Waste Management Act.

As part of the development and watermains upgrade works, any material excavated for offsite disposal will be disposed of in line with the Waste Soil Assessment criteria thus mitigating potential risks to human health or the environment associated with contamination on the site. Waste categories for the disposal of soils are outlined in **Table 5.7** along with possible disposal facilities for each category of waste.

Table 5.7 – Soil Waste Categories

Waste Category	Title	Classification Category	Potential Outlet
Category A	Inert Waste Criteria	Reported concentrations less than inert waste guidelines, which are based on waste acceptance criteria set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). Results found to be non-hazardous using the HazWasteOnline application.	Potentially suitable for reuse or recovery subject to Planning and/or Waste Permissions and acceptance criteria.
Category B	Inert (with elevated PAHs)	Acceptance Criteria as laid out in Waste Licence W0129-02 and W0254-01. Reported concentrations less than inert waste guidelines, which are based on waste acceptance criteria set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002) with the exception of PAHs (Total 17 <100mg/kg). Results found to be non-hazardous using the HazWasteOnline application.	Disposal at Integrated Material Solutions or Walshestown Restoration
Category C1	Non-Haz Criteria	Analytical results greater than Category A criteria but less than non-hazardous waste guidelines, which are based on waste acceptance criteria set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002) no limit for TOC. Results found to be non-hazardous using the HazWasteOnline application.	Disposal/Recovery at licensed Landfill (Ballynagran, Knockharley, Drehid). Material can be sent for recovery as engineering material rather than disposed of (no landfill tax)
Category C2	Non-Haz Criteria but with trace asbestos	Results as per C1 but with trace asbestos	Material will need to be disposed of at a licensed landfill if trace asbestos confirmed. If asbestos level is quantifiable then it may have to be disposed in N. Ireland or further abroad.
Category D	Hazardous	Analytical results found to be hazardous using the HazWasteOnline application.	None in Ireland (export) with the exception of Enva in Portlaoise.

In total 183No. soil samples were collected and classified in accordance with S.I. 233 of 2015 using the HazWasteOnline software, classification engine WM3.v1.1. The leachate analysis results and a selection of total pollutant content results have been compared with the thresholds for acceptance of waste at inert, non-hazardous and hazardous landfill facilities as prescribed in the Landfill Directive.

The HazWasteOnline (HWOL) outputs are attached in Appendix C of the OCSC (2020) Waste Soil Classification report for the site contained in Appendix C Volume III of this EIAR.

Table 5.8 summarises the waste classification assessment of soil analytical results from the 2020 soil investigation on the site.

Table 5.8 – Soil Classification Results

	A	B1	B2	C1	C2	D	D1
	Inert – Waste Permitted or Recovery Sites	Inert e.g. IMS B1	Inert e.g. IMS Landfill Inc. Limits	Non-Haz	Non-Haz Quantifiable asbestos	Hazardous	Hazardous with Asbestos >0.1%
No. of samples	11	98	30	26	1	16	1

A total of 11No. samples have been identified as category A inert, 98No. samples as category B1 inert (IMS B1), 30No. samples as category B2 inert (IMS B2), 26No. samples as C1 Non-Haz, 1No. samples C2 Non-Haz with quantifiable asbestos, 16No. samples as D Hazardous and 1No. sample D1 Hazardous with asbestos >0.1%.

Site investigations have not been conducted to determine contaminants levels within the watermain upgrade area. Excavated material from these works will require stockpiling on site under controlled conditions as detailed in the CEMP. The materials will then be sampled and sent for laboratory analysis to determine the appropriate disposal option(s) for these materials.

The undertaking of disposal of soils from the development and watermains upgrade sites in compliance with the CEMP and the Waste Management Act will mitigate potential risks associated with these activities such that the impact associated with these works will be positive, permanent, and significant due to the removal of contamination source material.

Sources of Fill and Aggregates

The use of fill and aggregate containing recycled or recovered materials shall be considered. All imported fill and aggregate for the project will be sourced from reputable suppliers as per the project Contract and Procurement Procedures. All suppliers will be vetted for:

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

The undertaking of procurement and fill and aggregates in compliance with the CEMP will mitigate potential risks associated with these activities such that the impact associated with these works will be neutral, temporary to short-term, and not significant

Fuel and Chemical Handling

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

- Designation of bunded refuelling areas on the site (if required);
- Provision of spill kit facilities across the site;
- Where mobile fuel bowzers are used, the following measures will be taken:
 - Any flexible pipe, pump, tap, or valve will be fitted with a lock and will be secured when not in use;
 - All bowser units will carry a spill kit and operatives must have spill response training; and

- Portable generators or similar static operation fuel containing equipment will be placed on suitable drip trays.

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

- Secure storage of all containers that contain potential polluting substances in a dedicated, internally banded chemical storage cabinet unit or inside concrete banded areas;
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the site, they should be done so secured and on spill pallets; and
- Drums to be loaded and unloaded by competent and trained personnel using appropriate equipment.
- Refuelling and servicing of construction machinery to take place in a designated hardstanding area remote from surface water inlets (when it is not possible to carry out such activities off-site).
- Good housekeeping (site clean-ups, use of disposal bins, etc.) on the site.

The aforementioned list of measures is non-exhaustive and is included in the CEMP. The handling of fuel and chemicals on the development and watermains upgrade sites in compliance with the CEMP will mitigate potential risks associated with these activities such that the impact associated with these works will be negative, temporary to short-term, and slight.

Control of Water During Construction

Run-off from excavations/earthworks cannot be prevented entirely and is largely a function of the prevailing weather conditions. Earthwork operations will be carried out such that surfaces, as they are being raised, shall be designed with adequate drainage, falls and profile to control run-off and prevent ponding and flowing. Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. All run-off will be prevented from directly entering any water courses.

During construction, groundwater ingress into the excavations is possible, and a discharge licence will likely be required to enable discharge of water to the public sewer to keep the excavation dry. Should any discharge of construction water be required during the construction phase, discharge to foul sewer will be regulated under a Discharge Licence obtained from the Regulator (Irish Water) and issued under the Water Pollution Act. Attenuation, pre-treatment, and monitoring of discharge water will likely be required under any Discharge Licence (Section 16 Licence). Pre-treatment and silt reduction measures on site will include a combination of silt fencing, settlement measures (silt traps, silt sacks, and settlement tanks), surface water inlet protection, earth bunding adjacent to open drainage ditches, and hydrocarbon interceptors. Active treatment systems such as Siltbusters or similar may be required depending on turbidity levels and discharge limits. Qualitative and quantitative monitoring will be implemented as per the Conditions of any Discharge Licence. The client's environmental consultant will audit the sampling and analysis results as required to ensure conformance to the discharge licence limits and testing frequency requirements.

The control of water during construction on the sites in compliance with the CEMP and any required Discharge Licence will mitigate potential risks such that the impact associated with this phase of works will be neutral, temporary to short-term, and not significant to slight.

5.6.3 Operational Phase Mitigation

Mitigation measures envisaged during the operational phase comprise;

- Ensuring regular maintenance of site services, SuDS features, and attenuation systems such that they operate as designed.
- Emptying oil separators as per manufacturer's operation and maintenance recommendations to mitigate against risk of spillage / leaks into the soils.

During the operational phase of the development, there will be no requirement for fuel oil storage thus removing any potential source of contamination and resultant mitigation requirements. There are no proposals to connect to the gas supply to serve the development as the development will be heated by air source heat pumps. As such, the

potential impact following mitigation associated with the operational phase will be neutral, permanent, and not significant.

5.7 RESIDUAL IMPACTS

The predicted impacts of the construction phase are described in **Table 5.9** in terms of quality, significance, extent, likelihood, and duration. The relevant mitigation measures are detailed, and the residual impacts are determined which take account of the mitigation measures.

5.7.1 Construction Phase

The primary residual impacts from the construction phase are the land take/change of use and the removal of soil. These impacts are unavoidable given the nature, requirement, and design of the proposed development. The construction impact is assessed to be slight, negative, and permanent.

5.7.2 Operational Phase

During the operational phase of the development there will be no requirement for any fuel oil stores. There are no proposals to connect to the gas supply to serve the development as it will be heated by air source heat pumps. The residual impact is primarily associated with drainage services on the site and is assessed to be a negative, imperceptible, and permanent.

Table 5.9 – Detailed Impact Assessment – Construction Phase

Constraint		Impact Assessment							
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
Earthworks	Site Clearance Excavation Construction	Excavation of fill material, natural soils, and subsoil for foundations, attenuation tanks, drainage, watermain upgrades, etc.	Negative	Slight	Local	Certain	Permanent	The minimum amount of space to construct the project has been designed for. Material will be reused on site where possible.	Slight Negative
	Site Clearance Excavation Construction	Excavation of fill material, natural soils, and subsoil for foundations, attenuation tanks, drainage, watermain upgrades, etc.	Positive	Slight	Local	Likely	Permanent	Made ground will be classified in accordance with the Waste Soil Acceptance criteria as part of the site investigation and disposed of at the relevant suitable facility.	Slight Positive

Constraint		Impact Assessment							
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
	Excavation	Soil erosion causing airborne dust and/or nuisance dust on public roads and neighbouring properties	Negative	Slight	Local	Unlikely	Short-term	Dust suppression measures will be implemented to minimise dust generation during extended dry periods. Dust monitoring will be conducted throughout the excavation period. Vehicle wheel wash facilities will be installed at site exits and a road sweeping programme will be implemented	Imperceptible Negative
Earthworks	Excavation Construction	A degree of fill will be required during the works which will include imported fill and aggregates	Negative	Slight - Moderate	Local (maybe a number of quarry sites)	Likely	Permanent	Contract and procurement procedures will ensure that all aggregates and fill material required for the construction are sourced from reputable suppliers. Declarations of conformity/compliance certificates will be required to ensure all aggregates supplied meet the specified engineering specifications.	Imperceptible Negative

Constraint		Impact Assessment							
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
Earthworks Dewatering/ lowering the water table	Excavation Construction	Discharge of contaminated groundwater to sewer as a result dewatering	Negative	Slight	Local (maybe a number of nearby buildings)	Likely	Short-term	The appointed dewatering contractor will be supplied with groundwater analytical results. The contractor will design an on-site pre-treatment system based on the results.	Imperceptible Negative
Storage of potentially polluting materials	Site Clearance and Excavation General Construction	Potential leak or spillage from construction related liquids on site	Negative	Significant	Local	Unlikely	Long-term	Good housekeeping and proper handling, storage, and disposal of any potentially polluting substances can prevent soil and/or water contamination. Designated and bunded storage areas will be maintained.	Imperceptible Negative

Constraint		Impact Assessment							
Activity/ Source	Construction Element	Impact Description	Quality	Significance	Extent	Likelihood	Duration	Mitigation	Residual Impact
		Potentially contaminated run-off percolating to ground and the underlying aquifer	Negative	Significant	Local	Unlikely	Short-term	Although there will be no direct discharge to groundwater during construction, indirect discharges to the underlying bedrock aquifer may occur increasing aquifer vulnerability, albeit not significantly given the thickness of Boulder Clay beneath the site. Protection of groundwater from potentially polluting substances will be dealt with through a number of measures including correct handling and storage of potentially polluting substances.	Imperceptible Negative
Capping of Site Soils	General Construction Operations	Reduction of rainwater infiltration	Negative	Moderate	Local	Likely	Permanent	Use of permeable paving, bio-retention areas, swales, and tree pits will increase rainwater infiltration.	Slight Negative

5.8 MONITORING

This section describes monitoring measures to be implemented to ensure that site construction and operational phases of the proposed development do not pose any potential adverse geological impact to the site or surrounding area.

5.8.1 Construction Phase Monitoring

Construction phase monitoring relates to the good maintenance of mitigation measures outlined above in section 5.8, including the CEMP contained in Appendix B Volume III of this EIAR. Proposed monitoring during the construction phase in relation to the soil and geological environment includes:

- Soil removed during the construction phase is to be monitored to maximise potential for re-use on site. Any contaminated soil encountered and not identified on site investigations will be analysed and disposed off-site at a suitable licensed facility.
- The quantities of topsoil, subsoil and rock removed off site will be recorded.
- Record keeping and monitoring of import and export of soils shall be carried out in accordance with the Waste Management Act. All waste haulers and receiving facilities shall have valid permits in accordance with the Waste Management Acts and Planning Conditions.
- Monitoring of any hazardous material stored on site forms part of the Construction & Demolition Waste and By-Product Management Plan, included in the application and Chapter 11 of this EIAR Material Assets Waste Management.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill; protection of soils from contamination for removal from site)
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection, etc.)
- Monitoring shall be carried out as per the conditions of any water Discharge Licence associated with the construction phase of the project.
- Monitoring of dust and noise shall also be carried out as specified in the planning permission should the development be allowed to proceed.
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road sub-formation level in advance of placing capping material, stability of excavations etc.).
- Inspection of fuel / oil storage areas.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities.

5.8.2 Operational Phase Monitoring

There is no requirement for monitoring during the operational phase except for that associated with the regular maintenance of site services, SuDS features, and attenuation systems such as oil separators.

5.9 INTERACTIONS

During the construction phase, possible interactions of soils, geology, and hydrogeology may interact with other following aspects:

- **Biodiversity:** The predicted excavation and construction activities with the site will result in the loss of some permanent habitat and the disturbance to some species on areas of the site which are currently green space.
- **Hydrology & Water:** Site preparatory works (i.e. site clearance, re-profiling, etc.) can potentially lead to elevated silt/sediment or other contaminant loading due to construction site runoff. Dewatering of excavations during the construction phase can result in water with elevated silt and possible chemical contaminants requiring discharge to the local drainage system. Construction stage works can potentially impact water and hydrology due to the risk of accidental spills, cross-contamination due to incorrect waste soils management, use of contaminated material as fill, etc.
- **Air Quality and Climate:** Dust generated during site clearance, reprofiling, excavation, and soil reinstatement works can lead to temporarily diminished air quality.

- **Noise and Vibration:** Excavation of soils and can lead to temporary noise and vibration within the site.
- **Cultural Heritage/ Built Heritage:** The proposed construction activities on the site will significantly alter the local landscape.
- **Material Assets: Traffic:** Removal of waste soil and stone from the Site and the importation of aggregate fill material will temporarily impact on local traffic volume.
- **Material Assets: Utilities:** The construction of utilities will require the excavation of soils within the site.
- **Material Assets (Waste Management):** Removal from site of a net excess of soil and stone to that required for construction and landscaping purposes will be required during the construction phase.
- **Population and Human Health:** Chemical contaminants that may pose a risk to human health were identified in site soils and groundwater during the site investigation and GQRA. These may be disturbed, exposed, and/or removed during the construction phase. Low to moderate radon levels are present in the site vicinity and may be increased by the removal of soils from the site.

The impacts of activities related to soils, geology, and hydrogeology on the aforementioned aspects of the Site during the construction phase are anticipated to generally be short-term, neutral in terms of quality, and not significant based upon the implementation of appropriate mitigation measures.

During the operational phase, the potential interactions related to land, soils, and hydrogeology are related to the accidental leaking of sewage, wastewater, fuel or chemical storage on the site, etc. The potential impact on soils, geology, and hydrogeology during the operational phase is anticipated to be long-term, neutral in terms of quality, and not significant given the implementation of appropriate mitigation measures.

5.10 DIFFICULTIES ENCOUNTERED

No difficulties were encountered in completing this section. It should be noted that all volumes are estimates based on similar schemes and review of proposals. Actual volumes / amounts may change based on final detailed design and condition of soils when exposed / excavated. It should also be noted that environmental site investigations have not been undertaken to date in the area of the watermain upgrade; therefore, sampling of soils from this area will be required prior to off-site disposal of soils.

5.11 CUMULATIVE IMPACTS

Existing and permitted developments were identified through planning records. The following permitted developments were identified in the area of the proposed development and watermain upgrade works:

- **Planning Ref:** 2997/21. **Applicant:** Derek Kelly. **Address:** Emmet Manor, Emmet Court, Saint Vincent Street West, Dublin, 8. **Decision date:** 10-Feb-2022. **Decision:** REQUEST AI EXT OF TIME. **Description:** *The development will consist of: (i) Construction of a four-storey flat-roofed apartment block comprising 4 no. one-bedroom and 12 no. two-bedroom apartments each to be served by private south facing terraces and 1 no. vehicular parking space; (ii) Provision of new bicycle shed and bin store to serve apartment block; and (iii) All ancillary works, inclusive of landscaping and SuDS drainage, necessary to facilitate the development. The proposal will increase the number of residential apartments within Emmet Court from 96 to 112 and reduce the number of car parking spaces from 87 to 75.*
- **Planning Ref:** 3815/20. **Application Type:** Permission. **Applicant:** Board of Management of Our Lady of Lourdes National School. **Address:** Our Lady of Lourdes National School, Goldenbridge, Inchicore, Dublin 8. **Granted:** 11-Mar-2021. **Description:** *PROTECTED STRUCTURE: The site is bordered by St. Vincent Street West and Emmet Crescent. The proposed development consists of: A) Phased demolition of the middle section of the existing school building; removal of prefabricated temporary teaching accommodation units and selected trees. B) Refurbishment and alterations of the retained sections of the building including internal works to existing classrooms on ground floor to provide a new two classroom special educational needs unit and provision of the application of new insulated rendering system to building facades and upgrade of existing windows and doors. C) Construction of two-storey extension to the middle section of the existing school building, consisting of a general purpose hall, special education tuition rooms, multi-purpose room, home school liaison room, 4 no. general classrooms, a library, offices, staff room, stores, toilets, circulation areas, and ancillary accommodation. D) Provision of 22 no. on-site car parking spaces. E)*

Widening of existing vehicular access and provision for a new pedestrian site access with refurbishment of existing gates and provision of new gates all facing Emmet Crescent Street. F) Provision of 60 no. on-site bicycle parking spaces; refurbishment of gate facing St. Vincent Street West; provision of covered bin store. G) Provision of new hard surfaced and planted play and amenity areas, erection of 6 no. new flagpoles, refurbishment and upgrade of existing boundary walls, fences and gates (as described above and including a pedestrian gate towards the convent at the western site boundary), and provision of ancillary site works at this location. The site is in the curtilage of protected structures, Sisters of Mercy Chapel & Convent to the west.

- **Planning Ref:** 4260/19. **Application Type:** Permission. **Applicant:** Circle Voluntary Housing Association. **Address:** Site 1b St. Michael's Estate, Inchicore, Dublin 8. **Granted:** 24-Jan-2020. **Description:** *Permission for development at this site (0.72 hectare), known as Site 1b St. Michael's Estate, Inchicore, Dublin 8 bounded by Richmond Barracks to the north, the rear of Connolly Avenue to the east and Thornton Heights to the south. The development will consist of a one to four storey older persons housing with supports scheme, incorporating: (i) 52 no. apartment dwellings with balconies; (a) 16 no. 2 bedroom apartments; (b) 36 no. 1.5 bedroom apartments. (ii) Communal facilities at ground floor level to include a multipurpose room, additional ancillary spaces, staff offices and a publicly accessible tea room (26.5m²). (iii) Landscaping works to include resident courtyards and a landscaped open space (facing the St. Michaels Estate road) incorporating a new vehicle setdown area. (iv) 15 no. car parking spaces. (13 no. new car parking spaces to be accessed from an existing vehicular entrance and the relocation of 2 no. existing car parking spaces adjacent to the new vehicle setdown area). (v) 52 no. bicycle parking spaces. (vi) (ESB substation), external signage, site perimeter boundary treatments, plant rooms, waste storage enclosures and all associated ancillary development works and services. (vii) The development will consist of the following floor areas: - Total gross internal floor area (GIA): 4,655m² (inclusive of all residential, communal, vertical circulation & ancillary spaces). - Area of external deck/gallery access (excluding balconies): 1,066.6m². - Area of roof terrace (excluding balconies): 100.1m². (viii) The building will be one to four storeys in height, with a top parapet level of 40.04m OD (measuring 14.835m above finished ground floor level).*
- **Planning Ref:** 2453/19. **Application Type:** Permission. **Applicant:** Vabtol Limited. Association. **Address:** Site to the rear of 205A, Emmet Road, Inchicore, Dublin 8. **Granted:** 29-July-2019. **Description:** *Amendment to Planning Ref. No. 3635/16 for the previous approved 4-storey apartment development in the backlands for the increase in height to six storey building above semi-basement level consisting of: 6 no. one-bed, 18 no. two-bed apartments; which include balconies to the north, west & south elevations, additional covered bike storage areas, refuse store, with revised 18 no. car parking spaces off vehicular access road from Emmet Road, with associated landscaping & site works.*
- **Planning Ref:** 2747/20. **Application Type:** Permission. **Applicant:** Durkan (Davitt Road) Ltd. **Address:** Former Dulux Factory Site, Davitt Road, Dublin 12, D12 C97T. **Granted:** 04-Nov-2020. **Description:** *The development will consist of modifications to development previously permitted under Reg. Ref. ABP-303435-19 (DCC Ref. SHD0002/19). The modifications for permission consist of (a) alteration to window format at third and fourth floor level on east and west elevation to provide windows to corridor only; (b) window format altered at sixth floor level of south elevation of Blocks A and B; (c) balconies and windows removed from eastern elevation of 4no. apartments at fifth and sixth floor level of Block B due to internal layout requirements related to fire safety; (d) extension of elevator and lift core within Block A from fourth floor to fifth floor level for fire safety purposes, giving an overall height increase of 3.7m; (e) communal lounge extended by 3sqm to connect to extended lift/stair core at fifth floor level; (f) ESB Kiosk (approx. 23.47sqm) at Galtymore Road elevation relocated approximately 6m to the east and redesigned to ESB standards; (g) bin store added to internal layout of ESB substation building (approx. 7.09sqm); (h) bin store (approx. 9.77sqm) added to eastern courtyard; (i) accessible rest room added to guest room at fifth floor level; (j) glazed balconies converted to brick at ground floor level of south elevation and east and west internal courtyard elevations; (k) alteration to glazing at street level of Block B fronting Davitt Road; (l) alterations to selected balconies (8no.) at third and fifth floor to convert from cladding to glazed treatment; and (m) unit*

layouts of apartments 104 and 110 at first and second floor of block B, fronting Davitt Road, reconfigured to allow sufficient separation distance between proposed balconies and ground floor ESB substation entrance.

- **Planning Ref:** 2221/21. **Application Type:** Part 8 Development. **Applicant:** Dublin City Council Housing and Community Services Department. **Address:** Emmet Road, Inchicore, Dublin 8 **Granted:** 09-April-2021 **Description:** Pursuant to the requirements of the above notice is hereby given of the proposed demolition of the former health centre and St. Michael's community centre at Emmet Road, Inchicore, Dublin 8 and associated site clearance works which include the remains of a disused halting site together with internal site walls, fences, hard surfaces and utilities. No new construction works are proposed at this time, other than those necessary to secure the site or divert services. The foundations of the buildings will be removed, and all services will be removed insofar as this is practicable. The site is bounded by a combination of walls and fences of different types, and it is proposed to leave these in place, pending re-development. Most of the paved surface of the site will be removed, and the site grassed pending re-development. The re-development of the subject site will be subject of a separate planning application and consultation process. The local Authority has concluded following a preliminary examination that there is no real likelihood of the proposed development having significant effects on the environment and therefore an EIAR is not required.
- **KA29N.314091 Liffey Valley to City Centre, County Dublin – Bus Connects** On the 15th of July 2022, the National Transport Authority lodged the Liffey Valley to City Centre Core Bus Corridor Scheme Compulsory Purchase Order 2022. The Case is due to be decided by 25/01/2023. Further detail is available at [Home - BusConnects Dublin – Liffey Valley to City Centre \(liffeyvalleyscheme.ie\)](http://Home - BusConnects Dublin – Liffey Valley to City Centre (liffeyvalleyscheme.ie)).

Although all impacts resulting from the development and watermain upgrade projects were considered with regard to cumulative impact, the primary potential cumulative impact associated with the development site and similar sites nearby is due to the local increase in hard standing and subsequent decrease in local groundwater recharge as the landscape changes from predominantly greenfield to large, impermeable areas. This cumulative impact is slight to moderate, negative, and permanent. However, mitigation measures have been included in the design of this proposed development to increase groundwater recharge within the site as outlined in Table 5.11.

Each project currently permitted or under construction is subject to EIA and/or planning conditions which include appropriate mitigation measures to minimise effects on the land and geological and hydrogeological environments. Cumulative impacts other than the increase in hardstanding, if any, will be limited to the construction stage and will, therefore, be temporary to short-term in duration. If mitigation measures for the developments are carried out as permitted, there will be no significant cumulative impacts on the land or geological and hydrogeological environments.

Overall, the cumulative impact of the construction of the proposed development is predicted to be neutral in terms of quality, temporary in duration, and of an imperceptible significance.

The proposed BusConnects route is located to the north of the proposed development and encompasses the area of the watermain upgrade works on Emmet Road. Were these two projects undertaken concurrently, there would be a significant, temporary, negative impact with regard to traffic in the site area. If the upgrade works were not undertaken concurrently with the BuConnects works but along with other currently permitted projects, the impact is likely to be temporary, moderate, and negative.

5.12 DO NOTHING SCENARIO

In the 'Do Nothing' scenario, if the construction of the development at the site does not take place, the permeable surface of the majority of the site will continue to allow for rainwater recharge. Therefore, in the 'do nothing' scenario, the resulting impact is neutral.

5.13 REFERENCE AND SOURCES

The sources for the geology desk study are referenced following:

- Environmental Protection Agency Envision Data Viewer: <http://gis.epa.ie/Envision>
- Environmental Protection Agency (2022). Guidelines on the Information to be contained in Environmental Impact Assessment Reports.
- Farrell, E.R., and Wall D. (1990). Soils of Dublin, Institution of Engineers of Ireland, 115, 78-9.
- GeoHive online mapping tools: <https://webapps.geohive.ie/mapviewer/index.html>
- Geological Survey of Ireland Geotechnical Data Viewer
<http://spatial.dcenr.gov.ie/GeologicalSurvey/GeoTechnicalViewer/index.html>
- Geological Survey of Ireland National Groundwater Viewer
<http://spatial.dcenr.gov.ie/GeologicalSurvey/Groundwater/index.html>
- Geological Survey of Ireland General Data Viewer http://spatial.dcenr.gov.ie/imf/imf.jsp?site=GSI_Simple
- Geological Survey of Ireland GeoUrban Data Viewer <http://spatial.dcenr.gov.ie/imf/imf.jsp?site=GeoUrban>
- Geological Survey of Ireland Quaternary Geology map of Dublin.
- Geological Survey of Ireland Geotechnical Database (Reports No 1069, 56, 4901, 392, 707, 4688 and 4690).
- Google Earth Pro aerial images.
- Institute of Geologists of Ireland (2013) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.
- Looby, M. & Long, M. Deep Excavations in Dublin, Recent Developments. Paper first presented to a meeting of the Geotechnical Society of Ireland at Engineers Ireland, 22 Clyde Rd, Dublin 4, on 11th December 2007.
- Long, M., Brangan, C., Menkiti, C., Looby, M. & Casey, P. 2012. Retaining walls in Dublin Boulder Clay, Ireland. Proceedings of the ICE – Geotechnical Engineering [Online], 165. Available: <http://www.icevirtuallibrary.com/content/article/10.1680/geng.9.0091>.
- Long, M. & Menkiti, C.O (2007). Geotechnical Properties of Dublin Boulder Clay. Geotechnique, No. 7, 595-611.
- Long, M. & Murphy, B. (2003). Difficulties with Ground Anchorages in Hard Rock in Dublin, Ireland. Geotechnical & Geological Engineering, 21, 87-111.
- Metro North Railway Order Application – An Bord Pleanála Further Information Request, Item 19 Groundwater and Hydrogeology, Pages 18-34, 2010.
- McConnell, B. and Philcox, M., (1994). Geology of Kildare-Wicklow: A geological description to accompany the Bedrock Geology 1:100,000 Scale Map Series, Sheet 16, Kildare-Wicklow. Geological Survey of Ireland.
- National Parks and Wildlife Service online map tool
- OCSC (2020) ‘Emmet Road’ Generic Quantitative Risk Assessment (GQRA) Report
- OCSC (2020) Waste Soil Classification Report, Emmet Road
- Ordnance Survey of Ireland maps and aerial photos: <https://maps.archaeology.ie/historicenvironment/>
Skipper, J., Follett, B., Menkiti, C.O., Long, M. & Clark-Hughes, J. (2005). The engineering geology and characterisation of Dublin Boulder Clay, QJEGH, 38, 171-187.

6.0 WATER AND HYDROLOGY

6.1 INTRODUCTION

This chapter addresses issues relating to water and hydrology in respect of the subject lands and assesses the impact of the proposed development on these aspects of the existing environment.

6.1.1 Statement of Authenticity

This Chapter was prepared by Mark Killian, for O'Connor Sutton Cronin consulting engineers; he is a Chartered Engineer; has obtained Bachelor of Engineering and Master of Science degrees, with specialisation in surface water drainage and hydrology; and has over fifteen years' experience in the design and delivery of urban development schemes, with particular focus on flood risk management and drainage and water supply infrastructure. He has advised a range of clients including government bodies, local authorities, water companies and private developers, and has provided detailed designs for projects in Ireland, the UK, and Australia, taking account of local technical standards and hydrological conditions.

6.2 METHODOLOGY

This section outlines the legislation and guidelines considered, and the adopted methodology for preparing this chapter.

6.2.1 Legislation

- Directive 2000/60/EC of the European Parliament and of the Council of the 23rd October 2000 establishing a framework for community action in the field of water policy (the "**Water Framework Directive**")
- S.I. 722 of 2003 European Communities (Water Policy) Regulations 2003

6.2.2 Guidelines

The following documents and guidance material were reviewed in the preparation of this chapter.

- The Planning System and Flood Risk Management Guidelines for Planning Authorities (Department of Environment, Heritage and Local Government and the Office of Public Works); (2009)
- C624 Development and Flood Risk (Construction Industry Research and Information Association, CIRIA);
- Dublin City Development Plan 2016-2022;
- Draft Dublin City Development Plan 2022-2028;
- Dublin City Council's Sustainable Drainage Design and Evaluation Guide, 2021;
- OPW website www.floodinfo.ie;
- DECLG website www.myplan.ie;
- OPW website www.floodmaps.ie;
- Dublin City Council's and Irish Water's Drainage and Watermain Records;
- Geological Survey of Ireland Maps.

6.2.3 Desktop Study

The objectives of this chapter were achieved by way of a desk study and baseline data collection. A list of sources for the desk study together with relevant legislation are included below. The source of knowledge will be based on the following guidelines:

- DCC Local Authority Requirements (with liaison with technical departments);
- BS EN 752 - Drainage Outside Buildings;
- The Building Regulations - Technical Guidance Document Part 'H';
- Recommendations for Site Development works for Housing Areas, Department of the Environment, Housing and Local Government, 1998;
- GSDS;
- BS EN 12056-2:2000 Gravity drainage systems inside buildings;
- The SuDS Manual (CIRIA C753);

- EPA Wastewater Treatment Manual, For Small Communities;
- Irish Water Code of Practice for Water Infrastructure; and
- Irish Water Code of Practice for Wastewater Infrastructure.

Additional information has been compiled through consultation and feedback from stakeholders and the project / EIAR Team and from the following sources:

- The Geological Survey of Ireland (GSI);
- The Environmental protection Agency (EPA);
- Site Investigation Report (December 2020) -- GII (Refer Appendix C Volume III of the EIAR);
- Site visit completed by OCSC;
- GSI online maps and databases;
- Eastern Catchment Flood Risk Assessment and Management Study (ECFRAMS) flood mapping from the OPW (November 2017);
- EPA online maps and databases;
- River Basin Management Plan 2009-2015 (2010) – Eastern River Basin District (ERBD);
- Eastern River Basin Management Plan 2009-2015 - Coastal waters; Programme of measures; Summary Report (2010) - ERBD;
- Eastern River Basin Management Plan 2009-2015 - Transitional water bodies; Programme of measures; Summary Report (2010);
- OSI;
- NPWS;
- Dublin City Development Plan (**DCDP**) 2016 -2022; and
- Volume 7 DCDP 2016 - 2022: SSFRA;
- Draft Dublin City Council Development Plan 2022 – 2028.
-

6.2.4 Assessment Methodology

An initial assessment was carried out which defined the project in terms of location, type and scale, established the baseline conditions, established the type of hydrological environment, established the activities associated with the project and initial assessment and impact determination. These objectives were achieved by way of a desk study and baseline data collection. A list of sources for the desk study together with relevant Legislation are included in the Section 6.2.1 **Error! Reference source not found.**, 6.2.2 and 6.2.3. Additional information has been compiled through consultation and feedback from stakeholders and the Design Team.

Under the Water Framework Directive (WFD) and corresponding Regulations, the water quality of Ireland's surface and groundwater is assessed biologically, physically and chemically. Assessments are conducted by the EPA and Local Authorities and have been compiled and presented in a standardised manner for River Basin Districts. Baseline information on the local and regional surface water bodies, their status and threats were obtained from a range of documents and online sources including the EPA's Water Quality database, Ireland's Water Framework Directive "Water Matters" online resource and the Eastern River Basin District (ERBD) website and reports.

A Site-Specific Flood Risk Assessment (Refer document B967-OCSC-XX-XX-RP-C-0007) was carried out by O'Connor Sutton Cronin Consulting Engineers. This assessment considered flood risk to the proposed development from all potential sources and the possible impact of the proposed development on flood risk elsewhere. Relevant sources / mechanisms of flooding include tidal / coastal, fluvial, pluvial, existing drainage and water infrastructure, proposed drainage and water infrastructure and groundwater. The assessment was conducted in accordance with:

- The Planning System and Flood Risk Management Guidelines for Planning Authorities (Department of Environment, Heritage and Local Government and the Office of Public Works);
- C624 Development and Flood Risk (Construction Industry Research and Information Association, CIRIA)
- Dublin City Development Plan 2016-2022; and
- Draft Dublin City Development Plan 2022-2028.

Record information on the existing infrastructure were obtained from Irish Water:

Information on all services is supplemented with information obtained from site topographical survey, site inspections and Ordnance Survey Ireland mapping.

In order to further determine the existing environment, an Underground Utilities Survey was carried out by Apex Surveys Ltd. at the subject site between August and September 2020 (and contained in Appendix C of Volume III of this EIAR. The survey methods adopted included manhole surveys, ground penetrating radar (GPR) surveys, radio detection and surveys of visible services using GPS/Total Station. The results provide further clarification as to the existence and location of utilities, which are as illustrated on the engineering drainage and watermain drawings that accompany this planning application.

Assessment of existing and proposed infrastructure for wastewater drainage, water supply and surface water drainage was conducted in accordance with I.S. EN12056: 2000 'Gravity Drainage Systems inside Buildings', I.S. EN752: 2017 'Drain & Sewer Systems outside Buildings', 'The Greater Dublin Region Code of Practice for Drainage Works', Irish Water's 'Code of Practice for Wastewater Infrastructure', Irish Water's 'Code of Practice for Water Infrastructure' and the recommendations of the 'Greater Dublin Strategic Drainage Study', (GDSDS).

Allowable surface water runoff from the development site has been calculated using the 'Greater Dublin Strategic Drainage Study' (GDSDS) in accordance with Dublin City Council requirements and the Institute of Hydrology Report No.124 to estimate existing Greenfield runoff rates.

6.2.5 Application of Methodology

Local Hydrology

The site of the proposed development comprises approximately 3.85 hectares, of which, comprising existing buildings and hardstanding area, with the remaining areas infilled open space that used to contain old tenement buildings prior to being demolished.

The development will incorporate "green roof" landscaped areas, with a range of soil depths. In accordance with CIRIA Report C644 Building Greener (Construction Industry Research and Information Association, 2007), green roofs provide interception of rainfall, reducing the rate and volume of rainfall runoff. The ground level streets and public square will be drained through linear drains, pervious paving and bio-retention areas (rain-gardens) to underlying drainage medium. In accordance with CIRIA Report C753 The SuDS Manual (Construction Industry Research and Information Association, 2015), pervious paving and bio-retention areas provide water quality treatment and runoff rate reduction.

6.2.6 Study Area

6.3 RECEIVING ENVIRONMENT (BASELINE SCENARIO)

The Project Site is within an extensively investigated and studied region with a wealth of hydro-environmental data sources available within a 5km site catchment radius. The hydrology of the Dublin region, including the properties and characteristics of the waterbodies, catchments, rivers, streams and estuaries have been well studied and there are several resources including;

- Greater Dublin Strategic Drainage Study (2005);
- River Basin Management Plan 2009-2015 (2010) - Eastern River Basin District (ERBD);
- Eastern River Basin Management Plan 2009-2015 - Coastal waters; Programme of measures; Summary Report (2010) - ERBD; and
- Eastern River Basin Management Plan 2009-2015 - Transitional water bodies; Programme of measures; Summary Report (2010) - ERBD Eastern River Basin District.

6.3.1 Topography & Land Use

The overall development site area is approximately **3.8-hectares** (9.4 acres) and is currently zoned by Dublin City Council for **Z14, Strategic Development and Regeneration Areas**. This zoning seeks *'the social, economic and physical development and/or rejuvenation of an area with mixed use of which residential and 'Z6' would be the predominant uses.*

The site is graded naturally towards the northeast corner of the site. For context, the highest part of the site, located in the southwest corner of the site, has an existing level of approximately +27.5m AOD; with the lowest typical level being in the order of +22.2m AOD located in the northeast corner of the site.

The site currently comprises of a mixture of brownfield areas which previously housed the Saint Michael's Estate development together with the current existing buildings/structures:

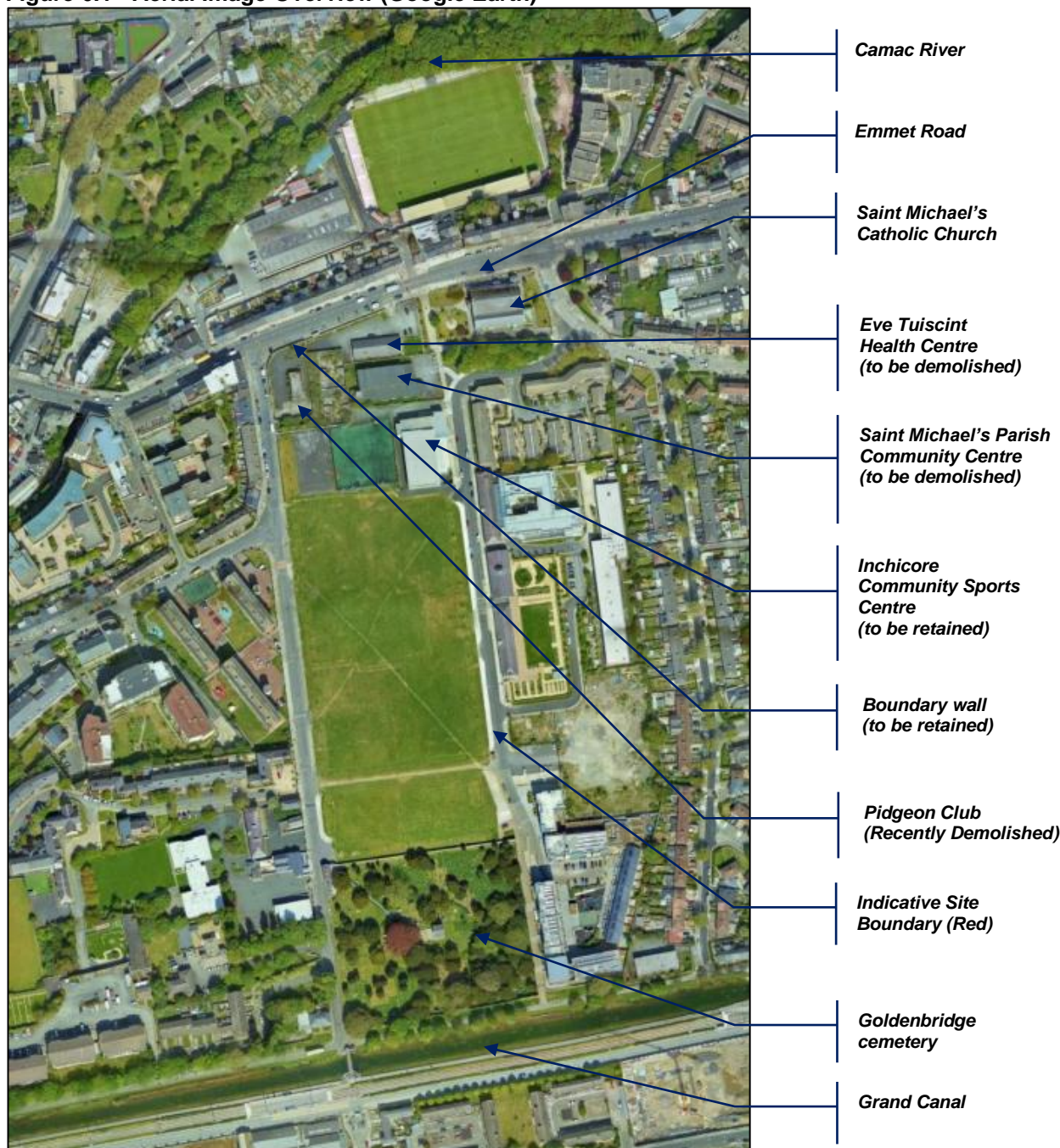
- St Michael's Parish Community Centre (to be demolished permitted under a separate Part 8);
- Eve Tuiscent Health Centre (to be demolished permitted under a separate Part 8);
- Inchicore Community Sports Centre (to be retained);
- Boundary wall to the north western corner of the site (to be retained).

There are a number of existing structures outside of the site that are of importance. These include:

- Inchicore Primary Care Centre to the east of the site;
- Richmond Barracks to the east of the site.

The locations of the above building relative to the site are shown in Figure 6.1.

Figure 6.1 - Aerial Image Overview (Google Earth)



6.3.2 Existing Surface Water Features & Hydrology

No watercourses or surface water features of any type are present within the site boundary. The closest such features are the Grand Canal, located approximately 50m to the south of the site; and the Camac River, located approximately 150m to the north. Historic development in the area has resulted in a large percentage of local surface water runoff from the site being discharged to the combined sewerage infrastructure, which ultimately drains to the Ringsend Wastewater Treatment Works. There are some public surface water infrastructure in the immediate vicinity of the site that discharge directly, and largely untreated, to the Camac River.

6.3.3 Regional Hydrology

The primary Groundwater Body (GWB) in the region is the Dublin Urban GWB. The Dublin Urban GWB covers 837km² and includes most of Dublin City to the eastern seaboard and extends west to include parts of Kildare and

Meath. In addition to the Carboniferous limestones and shales, there are also some sandstones present. The bedrock aquifer is a fractured system i.e., it is dominated by secondary (fracture or fissure) flow with very little to no flow within the matrix i.e., the bedrock is largely impermeable. The limestone aquifer has low storage capacity in the order of 1-2%. The Dublin Urban GWB comprises:

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

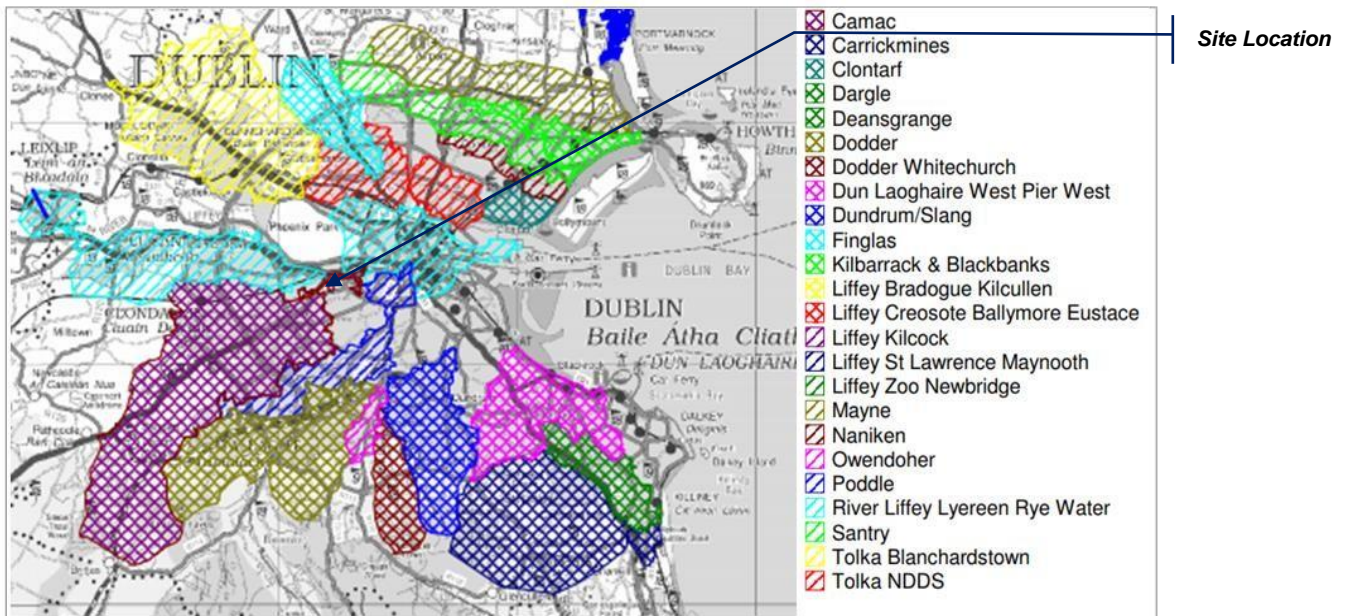
The Site is separated from the northern limestones along the Donnybrook-Tallaght syncline. To the south of the Dublin Urban GWD there is till derived from Granite (Northern and Upper Liffey Valley Plutons) and Lower Palaeozoic rocks in the Dublin Mountains. The Granite (Igneous Intrusive rocks - Pale grey fine to coarse-grained granite) in the vicinity of the site is classified by the GSI as a Poor aquifer (PI), generally unproductive except for local zones. In general, permeability is poor below 1-10m²/day (Creighton *et al.*). Between the coast and the Site there are deposits of Irish Sea Till, which is the least permeable of the subsoils.

In general, fracture flow dominates and there is a distinct reduction in permeability with depth. Packer tests show permeabilities reduce an order of magnitude for each five metres of depth in the limestone (Aspinwall & Company, 1979). The majority of flow is in the upper weathered bedrock and is common within fractures and fissures at depths of up to 50 metres below ground level (mBGL). Regional groundwater flow is towards Dublin Bay and the Irish Sea to the east.

The site lies within the Eastern River Basin District (ERBD). The ERBD covers a large area (c. 6,300 km²) extending from parts of Co. Cavan in the north to south Wicklow and from parts of Co. Westmeath to the Irish Sea. The main river catchments in the RBD are the Boyne, the Nanny/Delvin, the Liffey and the Avoca/Vartry.

The district is further divided into Hydrometric Areas (HA) and the site lies within HA09 which is the catchment draining to Dublin Bay. Hydrometric Area 09 is the most densely populated in Ireland and contains a relatively large area of urbanised land (c. 21%) with agricultural land comprising over 60% of the catchment. Given the urban nature of the catchment, the water bodies within it are subject to prolonged and sustained pressure from pollution via point and diffuse sources. The water bodies have also been subject to high degrees of modification and canalisation as a result of development through the years.

Figure 6.2 - Dublin City Water Catchments (GSDSDS)



The main project site is located approximately 150m due south from the River Camac, which is a tributary to the River Liffey, and is therefore considered to be within the Liffey Catchment. Additional works relating to the upgrade of c. 200m of the water main to the west along Emmet Road are also proposed. The Liffey rises in the Wicklow Mountains near the Sally Gap and the upper catchment consists of high mountains areas of Co. Wicklow. The river flows for c.125 km through Co. Wicklow, Co. Kildare, and Co. Dublin before entering the Irish Sea at Dublin Bay. The catchment area is c.1,250 km². The Liffey is impounded by dams at Poulaphouca, Golden Falls and Leixlip; the

impoundments are associated with hydroelectric generation and water extraction. These installations regulate the river flow.

The Liffey Estuary stretches from Islandbridge (c. 4.5 km upstream of the subject site) to the end of the Bull Wall. For the purposes of WFD assessment and classification, the estuary was split into the upper and lower water bodies. The Liffey Estuary is dominated in terms of land use by Dublin City and in the lower reaches by Dublin Port and the associated industrial areas. The former industrial docklands area has undergone major redevelopment in recent years and now has a service sector development along its perimeter. Whilst the flow in the estuary itself is to some extent regulated by the controlled release of water from the upstream reservoirs, the mixing processes in the estuary are typified by a classic “salt wedge”.

The Liffey Estuary is transitional water (tidal) up to Islandbridge, which is in the vicinity of where the River Camac discharges, and has been classified as a eutrophic, nutrient sensitive water.

Discussion within the Water Framework Directive (WFD) on the river Camac notes the river as being currently classified with a Moderate Status in the upper reaches and Poor Status in the lower reaches (i.e., in the vicinity of the subject site). It is further noted that significant interventions will be required in order to achieve Good Status and address the many pressures on the waterbody, which exist because of human activities.

All excess rainfall runoff in the vicinity of the subject site, currently discharges either to a local combined sewer network, or to the River Camac, north from the site. Refer to Chapter 12 – Material Assets - Utilities, for further information of existing surface water drainage infrastructure.

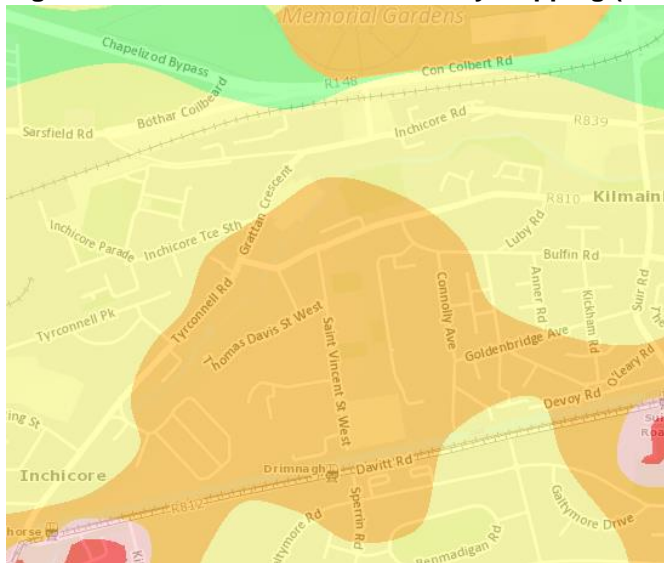
The Grand Canal is located approximately 50m to the south from the project site but is not hydrologically linked to the subject site.

6.3.4 Site Hydrogeology and Groundwater

An assessment carried out under the WFD has concluded that the groundwater within the Dublin Urban GWB has a “Good” status. The objective to the end of 2015 is to protect the “Good” status by recognising that the quality of the groundwater in the 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.

Vulnerability mapping of the Site has been published by the GSI and ranges from extreme to low. Vulnerability ratings are related to a function of overburden thickness and permeability which might offer a degree of protection and / or attenuation to the underlying aquifer from surface activities and pollution. A rating of extreme indicates a very thin overburden depth or highly permeable strata such as gravels. A rating of low indicates a thick overburden depth (<10m) of low permeability strata such as clay or glacial till. A review of the GSI interactive mapping identifies the vulnerability of the local groundwater as being ‘High’, denoted by the orange shading on Figure 6.3.

Figure 6.3 - Groundwater Vulnerability Mapping (GSI)



Dublin City is a highly urbanised area. The ground is generally made up of a cement and tarmacked impermeable cap which limits recharge to the bedrock. The only open areas where recharge may occur are at parks and gardens. It is conservatively estimated that 10% of the City area is available for recharge. Some recharge occurs from leaking sewers, mains and storm drains. Elsewhere diffuse recharge will occur via rainfall percolating through the subsoil. The proportion of the effective rainfall that recharges the aquifer is largely determined by the thickness and permeability of the soil and subsoil, and by the slope. Due to the generally low permeability of the aquifers within the Dublin Urban GWB, a high proportion of the recharge will run off and discharge rapidly to surface waterbodies via the upper layers of the aquifer, effectively reducing further the available groundwater recharge to the aquifer.

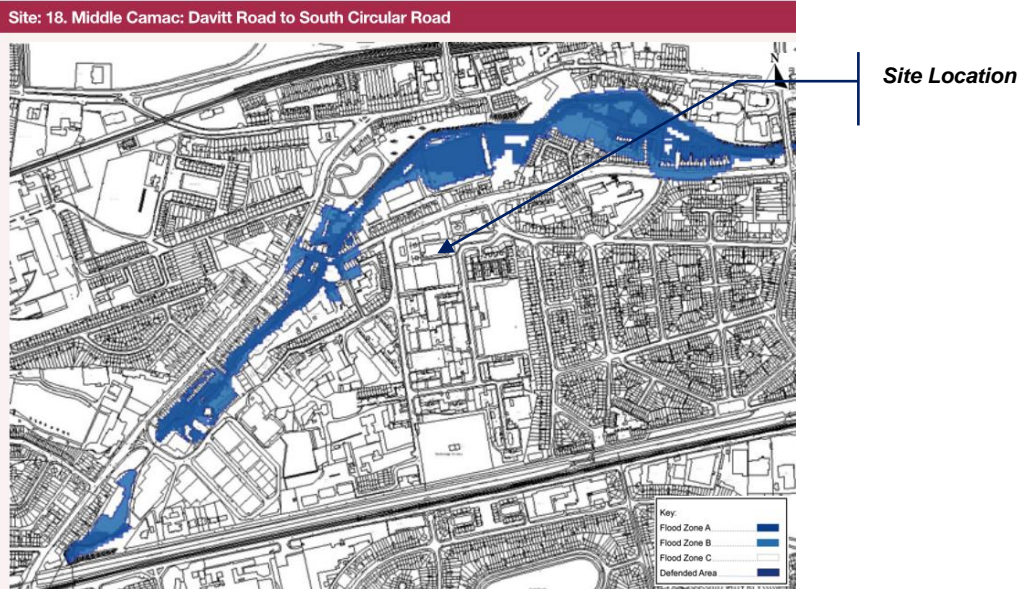
Based on the GSI website the effective rainfall in the vicinity of the Site is 50m/year. Recharge to the aquifer can only occur where rainfall can percolate through any subsoil to the aquifer. However, given the thickness of low permeability boulder clay, any water which percolates through the subsoil is likely to be perched on the significant thickness of Dublin Boulder Clay, with recharge to the local groundwater being insignificant.

A ground investigation was carried out by Ground Investigation Ireland, in 2020 (which is contained in Appendix C, Volume III of the EIAR, which confirmed the presence of groundwater within a number of trial pits, with typical depths ranging from 1m to 3m below ground level, however, no groundwater was recorder within the 13nr. Boreholes on site, which ranged in depth from 7m – 14.5m.

6.3.5 Flooding and Flood Risk

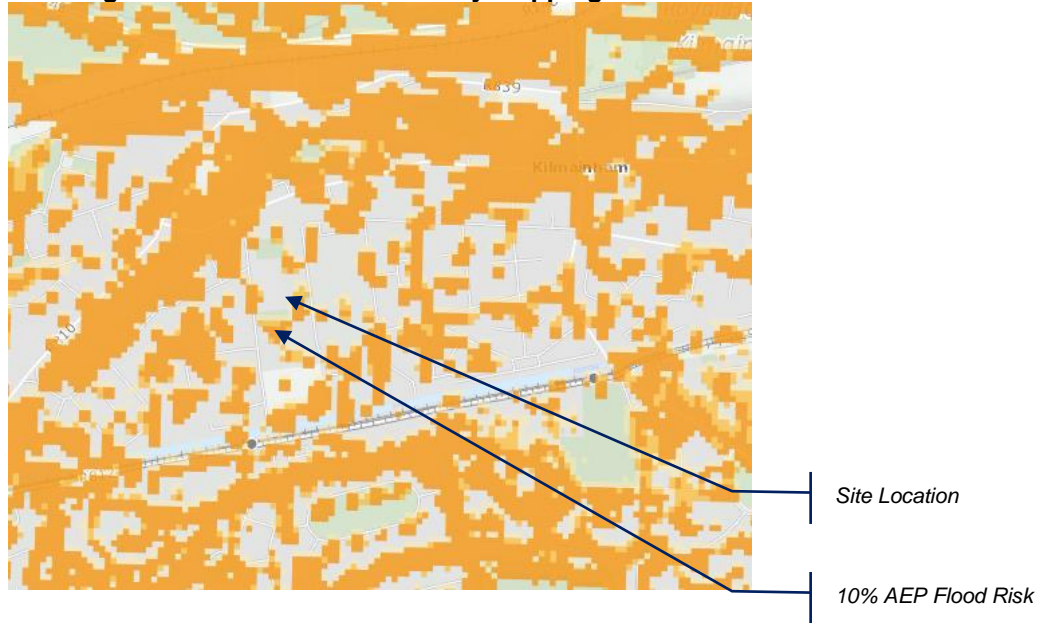
A Site-Specific Flood Risk Assessment has been carried out by OCSC, submitted with the Part 10 application, which assesses the potential flood risk to, and as a result of, the proposed development site. This assessment indicates that there is currently no apparent flood risk as a result of fluvial or coastal flooding i.e. it is located within Flood Zone C.

Figure 6.4 - DCC SSFRA Excerpt



The subject site is currently at apparent flood risk of pluvial flooding, in its existing condition, with assessment mapping from the Dublin City Pluvial Study, as carried out by Dublin City Council and published in 2012, identifying pockets of the subject site as being at risk of flooding during 10% AEP rainfall events.

Figure 6.5 - Dublin Pluvial Study Mapping



There is no historical evidence on The OPW’s website www.floodmaps.ie, of flooding occurring on the subject site, or in the immediate vicinity of the site.

6.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

In summary, the proposed development will comprise a mixed-use development comprising 578 no. apartments (Community Hub/Library, Creche, Retail/Café units) including a supermarket and public plaza fronting onto Emmet Road. The proposal entails the upgrade of watermain along Emmet Road to the junction of Tyrconnell Road and Grattan Crescent.

The characteristics of the development also include the demolition works permitted under planning reg. ref. 2221/21 relating to the northern part of the site.

A description of the project is provided in Chapter 2 of the EIAR. Further detail is provided in the Architects Design Statement.

6.4.1 Topography & Land Use

The developed site is to largely follow existing topography, with highest levels located in proximity to the southwestern corner of the site and falling in level in a north easterly direction. Site levels will be managed, in order to facilitate entrances to the new residential blocks, and the commercial development, as appropriate. However, finished levels will in general be similar to pre-development and existing conditions.

6.4.2 Proposed Surface Water Features & Hydrology

The finished surface levels across the site will allow the overall development to be split into 3nr. Main surface water drainage catchments, in order to best manage the rainfall runoff, and treat the surface water at source.

Each surface water catchment is to be split into sub-catchments, to further optimise the surface water management across the site and protect the hydrology characteristics of the locality.

In principle, the surface water management system is to comprise an integrated sustainable drainage system (SuDS), which utilises the proposed landscape features across the development site by allowing all paved areas to drain laterally to landscaped areas, for infiltration of upper layers of soil. A network of perforated pipes and land drains, along with overflow provisions, will ensure that the areas remain functional and not become saturated. The overall integrated sustainable drainage network is to typically comprise:

- Minimum 70% green roof coverage;
- Blue roof-podium at commercial block;
- Bio-retention zones across the site;
- Integrated SuDS tree pits;
- Filter drains;
- Pervious paving at all car parking zones;
- Intensive landscaping;
- Interception layer underneath the attenuation zones;
- Silt traps.

Infiltration of rainfall runoff is to be allowed and encouraged across the development's drainage network, however, ground investigations confirmed that the existing found has very poor ability to accept runoff, without provision of temporary storage structures, so will be of very little benefit to reduction of runoff volumes.

6.4.3 Regional Hydrology

Rainfall runoff on the proposed development will be collected by the new integrated sustainable drainage network, which is to discharge to the River Camac via the existing public surface water drainage network. However, all rainfall runoff is to be treated, and attenuated to greenfield equivalent runoff rates, so as not to cause adverse impact on the receiving networks and watercourse.

6.4.4 Site Hydrogeology and Groundwater

There is no basement construction proposed as part of this development, so groundwater and local hydrogeology will not be affected.

6.4.5 Flooding and Flood Risk

A site-specific flood risk assessment has been carried out by OCSC, which is submitted under separate cover of this application. The conclusion of this report indicates that the proposed development is not at any apparent risk of fluvial nor coastal flooding, nor does the proposed development pose any additional risk to the receiving environment.

The surface water drainage network has been designed to ensure that no flooding from the surface water drainage systems is experienced for the design rainfall events up to and including the 1% Annual Exceedance Probability (AEP), with an additional 20% allowance for climate change projections.

The proposed development is to comprise an integrated sustainable drainage system, with all rainfall runoff to be restricted to a maximum flow rate equivalent to the greenfield runoff rate (QBAR), so as not to cause adverse risk downstream of the development site. Furthermore, the provision of significant sustainable drainage systems across the development site, will help reduce the total volume discharging from site.

6.5 POTENTIAL IMPACTS (EFFECTS) OF THE PROPOSED DEVELOPMENT

6.5.1 Construction Phase

During the construction phase soils will be excavated to install new services (storm foul and water and electrical ducting) and for building foundations blocks. The removal of the soils will have a temporary insignificant, effect at the local/site scale on groundwater beneath the site, with no envisaged dewatering required.

Concrete will be used to form foundations and buildings and hard paved areas on the site. This has the potential to have a negative, slight, temporary effect on the groundwater quality immediately beneath the site.

There is the potential for accidental release to ground of fuel oils from oil storage tanks or from vehicles or plant, or chemicals used in the demolition or construction phases. While such an event is unlikely to occur, should that occur, this could have significant negative effect of temporary nature at the site scale on the groundwater beneath and down hydraulic gradient of the site as a result of oil or chemical contamination reaching the water table.

It is expected that surface water runoff during construction would be discharged to the local surface water network in the vicinity of the proposed development. Any such discharge from site would be subject to the conditions of DCC's discharge license application.

As the local surface water network discharges to the River Camac, approximately 150m north from the proposed development, the possibility of negative impact on the receiving environment would likely be brief, with possible slight effect. Overall, the construction phase will not pose a risk to the current status of the waterbody.

6.5.2 Operational Phase

During the operational phase, the development will have a positive, moderate, permanent effect on the groundwater at the site and local area scale. This will be as a result of the construction of buildings and hard paved surfaces over a large portion of the site. The groundwater will be protected against infiltration by contaminated surface water, for example caused by oil leaks from cars or delivery vehicles.

The proposed development is to discharge all surface water runoff to the local surface water network, which itself discharges to the River Camac nearby. The development comprises significant landscaping which allows for slight benefit to the receiving groundwater, however, site investigations confirmed the existing ground to be unsuitable for infiltration systems. The implemented SuDS across the new development will result in a positive impact on the current status of the waterbody and assist in the WFD's aim of achieving an overall Good status in the lower reaches.

6.5.3 Risks to Human Health

The impact of the proposed development will be beneficial to the receiving hydrology and hydrogeology features, and with little to no impact anticipated on the local groundwater, there is no apparent risk to human health.

6.5.4 “Do-Nothing” Scenario

If the proposed development were not undertaken, it is expected that there would be no change on the subject site and therefore no impact on hydrology arising from the subject site.

Unattenuated rainfall runoff would continue to discharge untreated to the receiving public infrastructure, which discharges to the River Camac.

The site is zoned for development, and it is likely that in the absence of this subject proposal that a development of a similar nature would be progressed on the site that accords with national policy for compact growth on brownfield sites and the site's zoning objectives.

6.6 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

6.6.1 Incorporated Design Mitigation

Surface water runoff from the proposed development will be managed in accordance with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS), with surface water attenuation and retention included as part of the main surface water drainage system.

Many design mitigation measures has been incorporated into the proposed development's surface water management system. Typically, all rainfall runoff is to be managed by an integrated sustainable drainage network, which utilises various sustainable drainage systems and landscaping features to treat rainfall runoff at source and intercept the initial rainfall flush. This ensures a higher quality of surface water, and lower total volume of surface water, discharging from site. The design mitigation measures include:

- Green roofs;
- Pervious paving car parks;
- Bio-retention zones;
- Filter drains;
- Integrated SuDS tree pits;
- Interception zones under attenuation;
- Silt traps;
- Flow controls;
- Deep landscaping features.

6.6.2 Construction Phase Mitigation

This stage of the development will be dealt with by the appointed contractor through the development and implementation of a Construction & Environmental Management Plan submitted under separate cover with this application. This plan will be agreed with the Local Authority prior to the commencement of construction.

Surface water on site will likely be required to be passed through settlement tanks and similar, with controlled discharge to the public network. This will be subject to approval of a construction discharge license from Dublin City Council.

Standard best practice measures including CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, (C532) will be applied to minimise potential impacts on surface water hydrology and groundwater. These include the following; potentially contaminating liquids in the on-site buildings including oil storage tanks, boilers, chemicals and cleaning agents will be removed from the site and disposed in accordance with the requirements of the Construction Environmental Management Plan (CEMP), prepared by OCSC Consulting Engineers, which is included under separate cover with this application.

All construction and demolition plant will be regularly checked to ensure there are no leaks or drips of oils to ground. Plant maintenance will not be undertaken on site. All fuel oils for plant will be stored in bunded storage areas in the site compound.

All construction materials with the potential to impact on water will be stored in secure bunded areas in the construction compound or at designated storage areas on the construction site footprint. Drip trays will be provided for drum storage.

All waste containers (including all ancillary equipment such as vent pipes and refuelling hoses) will be stored within a secondary containment system. Excavation and the stripping of soils will not be undertaken until absolutely necessary to prevent sediment run off and leaching of nutrients from soils into drains or to groundwater.

All potentially contaminating liquids in the existing site buildings, including oil storage tanks, boilers, chemicals and cleaning agents will be removed from the site and disposed in accordance with the requirements of the Construction Environmental Management Plan submitted under separate cover.

Excavated soils will be stockpiled to minimise the effects of weathering. Care will be taken in re-working this material to minimise dust generation, groundwater infiltration and generation of runoff. The following mitigation measures will be used to control the interaction of wash down water from concrete and cementitious material with water:

All batching and mixing activities will be located in contained areas

Pouring of cementitious materials will be carried out where possible in dry weather conditions;

- Pumped concrete will be monitored to ensure no accidental discharge;
- Excess concrete will not be discharged to ground;
- There will be no hosing into the ground surface of spills of concrete, cement, grout or similar materials;
- Washout from mixing plant or concrete trucks will not be permitted on the site.

The Contractor will be required to prepare and implement a Surface Water Management Plan that ensures avoidance and minimisation of effects. Surface water storage in excavations may be directed to on-site settlement ponds, where silt removal will be facilitated prior to discharge off site at a controlled rate. Periodic testing of the surface water discharge may also be undertaken.

If concrete mixing is carried out on site, the mixing plant will be sited in a designated area with an impervious surface. To minimise any impact on the water environment from material spillages, all oils, solvents, and paints used during construction will be stored within temporary bunded areas or chemical storage containers.

6.6.3 Operational Phase

Surface water runoff from the proposed development will be managed in accordance with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS), with surface water attenuation and retention included as part of the main surface water drainage system.

The surface water management proposals will reduce the overall adverse effects of the subject site on the existing environment by adopting a SuDS approach by combining elements such as blue roofs, bio-retention areas, attenuation storage and flow control.

The proposed drainage system will be commissioned and subject to a regular operational inspection and maintenance regime to ensure the system keeps operating within the design specifications.

The design mitigation measures outlined in 6.6.1 shall minimise the volume of rainfall runoff discharging from site to the river Camac and reduce the flow rate to greenfield equivalent; thus, reducing the flood risk downstream. The integrated sustainable drainage system will also act to capture silt, solids, and debris, along with hydrocarbons, which will result in a higher quality of surface water discharging from site.

The above will ensure that the receiving environment i.e., the river Camac, will likely have a significant positive impact, with permanent effects.

6.7 PREDICTED IMPACT FOLLOWING MITIGATION (RESIDUAL IMPACT)

Residual impacts are potential impacts after mitigation measures have been applied. As expected by definition residual impacts are therefore generally not quantifiable in terms of significance in terms of potential effects on the environment.

6.7.1 Impact on Climate

The impacts of the construction phase on hydrology and groundwater post mitigation will be slight, insignificant, temporary and at the site scale.

The use of SUDS mitigation measures in the Operational Phase will result in improved quality of surface water runoff to the off-site drainage network and in the quality the water percolating to the groundwater beneath the site. The impacts of the Operational Phase on hydrology and groundwater post mitigation will consequently be positive, significant, permanent and at the site scale.

The provision of the proposed integrated sustainable drainage network and significant landscaping, as part of the proposed development in the urban environment, offers slight permanent positive impacts on the receiving environment i.e., the hydrology and hydrogeology, as part of the existing site contains buildings and hardstanding that discharge runoff untreated and unattenuated to the local infrastructure. Overall, the implemented SuDS across the new development will result in a positive impact on the current status of the waterbody and assist in the WFD's aim of achieving an overall Good status in the lower reaches.

6.8 WORST CASE SCENARIO

6.8.1 Construction Phase

Significant spillage of oils or other contaminants during the construction phase could cause significant but temporary negative impact on the groundwater or receiving watercourse if allowed enter the public infrastructure.

6.8.2 Operational Phase

Failure of attenuation and flow control systems, through lack of maintenance or otherwise, could allow greater volumes for surface water discharge, and debris and sediment loads, to be discharged from the development, causing a temporary but significant adverse impact downstream.

6.9 MONITORING

The requirement and recommendation for monitoring related to the hydrological environment is as follows:

- Qualitative and quantitative monitoring of any water to be discharged to the local infrastructure during the construction and operation phases. This might include flow monitoring and a regular sampling and analysis programme, if required by the Regulating Authority under any Discharge Licence.
- Watching Brief and Discovery Strategy for any potentially contaminated material to ensure adequate classification and disposal (refer to Chapter 8 of Vol. II of this EIAR, Land and Soils);
- Regular inspection of on-site fuel storage facilities to ensure environmental ‘best-practices’ are being employed during construction;
- Upon installation of new drains, pressure tests will be carried out to assess the potential for leaks to occur in the newly constructed drains; and
- Following completion of the proposed drainage systems, a short-term flow and rainfall survey (involving in-pipe flow monitors and rain gauges on site) will be carried out to identify misconnections and allow for comparison with watermain meter readings to facilitate assessment and identification of any leakages.
- Regular inspection of maintenance of landscaping and sustainable drainage systems to ensure they are well maintained and remain functioning as per design.

6.10 CUMULATIVE IMPACTS

The following permitted developments were identified in the area of the proposed development and watermain upgrade works:

Planning Ref: 2997/21. **Applicant:** Derek Kelly. **Address:** Emmet Manor, Emmet Court, Saint Vincent Street West, Dublin, 8. **Decision date:** 10-Feb-2022. **Decision:** REQUEST AI EXT OF TIME. **Description:** *The development will consist of: (i) Construction of a four-storey flat-roofed apartment block comprising 4 no. one-bedroom and 12 no. two-bedroom apartments each to be served by private south facing terraces and 1 no. vehicular parking space; (ii) Provision of new bicycle shed and bin store to serve apartment block; and (iii) All ancillary works, inclusive of landscaping and SuDS drainage, necessary to facilitate the development. The proposal will increase the number of residential apartments within Emmet Court from 96 to 112 and reduce the number of car parking spaces from 87 to 75.*

Planning Ref: 3815/20. **Application Type:** Permission. **Applicant:** Board of Management of Our Lady of Lourdes National School. **Address:** Our Lady of Lourdes National School, Goldenbridge, Inchicore, Dublin 8. **Granted:** 11-Mar-2021. **Description:** *PROTECTED STRUCTURE: The site is bordered by St. Vincent Street West and Emmet Crescent. The proposed development consists of: A) Phased demolition of the middle section of the existing school building; removal of prefabricated temporary teaching accommodation units and selected trees. B) Refurbishment and alterations of the retained sections of the building including internal works to existing classrooms on ground floor to provide a new two classroom special educational needs unit and provision of the application of new insulated rendering system to building facades and upgrade of existing windows and doors. C) Construction of two-storey extension to the middle section of the existing school building, consisting of a general purpose hall, special education tuition rooms, multi-purpose room, home school liaison room, 4 no. general classrooms, a library, offices, staff room, stores, toilets, circulation areas, and ancillary accommodation. D) Provision of 22 no. on-site car parking spaces. E) Widening of existing vehicular access and provision for a new pedestrian site access with refurbishment of existing gates and provision of new gates all facing Emmet Crescent Street. F) Provision of 60 no. on-site bicycle parking spaces; refurbishment of gate facing St. Vincent Street West; provision of covered bin store. G) Provision of new hard surfaced and planted play and amenity areas, erection of 6 no. new flagpoles, refurbishment and upgrade of existing boundary walls, fences and gates (as described above and including a pedestrian gate towards the convent at the western site boundary), and provision of ancillary site works at this location. The site is in the curtilage of protected structures, Sisters of Mercy Chapel & Convent to the west.*

Planning Ref: 4260/19. **Application Type:** Permission. **Applicant:** Circle Voluntary Housing Association. **Address:** Site 1b St. Michael's Estate, Inchicore, Dublin 8. **Granted:** 24-Jan-2020. **Description:** *Permission for development at this site (0.72 hectare), known as Site 1b St. Michael's Estate, Inchicore, Dublin 8 bounded by Richmond Barracks to the north, the rear of Connolly Avenue to the east and Thornton Heights to the south. The development will consist of a one to four storey older persons housing with supports scheme, incorporating: (i) 52 no. apartment dwellings with balconies; (a) 16 no. 2 bedroom apartments; (b) 36 no. 1.5 bedroom apartments. (ii) Communal facilities at ground floor level to include a multipurpose room, additional ancillary spaces, staff offices and a publicly accessible tea room (26.5m²). (iii) Landscaping works to include resident courtyards and a landscaped*

open space (facing the St. Michaels Estate road) incorporating a new vehicle setdown area. (iv) 15 no. car parking spaces. (13 no. new car parking spaces to be accessed from an existing vehicular entrance and the relocation of 2 no. existing car parking spaces adjacent to the new vehicle setdown area). (v) 52 no. bicycle parking spaces. (vi) (ESB substation), external signage, site perimeter boundary treatments, plant rooms, waste storage enclosures and all associated ancillary development works and services. (vii) The development will consist of the following floor areas: - Total gross internal floor area (GIA): 4,655m² (inclusive of all residential, communal, vertical circulation & ancillary spaces). - Area of external deck/gallery access (excluding balconies): 1,066.6m². - Area of roof terrace (excluding balconies): 100.1m². (viii) The building will be one to four storeys in height, with a top parapet level of 40.04m OD (measuring 14.835m above finished ground floor level).

Planning Ref: 2453/19. **Application Type:** Permission. **Applicant:** Vabtol Limited. Association. **Address:** Site to the rear of 205A, Emmet Road, Inchicore, Dublin 8. **Granted:** 29-July-2019. **Description:** Amendment to Planning Ref. No. 3635/16 for the previous approved 4-storey apartment development in the backlands for the increase in height to six storey building above semi-basement level consisting of: 6 no. one-bed, 18 no. two-bed apartments; which include balconies to the north, west & south elevations, additional covered bike storage areas, refuse store, with revised 18 no. car parking spaces off vehicular access road from Emmet Road, with associated landscaping & site works.

Planning Ref: 2747/20. **Application Type:** Permission. **Applicant:** Durkan (Davitt Road) Ltd. **Address:** Former Dulux Factory Site, Davitt Road, Dublin 12, D12 C97T. **Granted:** 04-Nov-2020. **Description:** The development will consist of modifications to development previously permitted under Reg. Ref. ABP-303435-19 (DCC Ref. SHD0002/19). The modifications for permission consist of (a) alteration to window format at third and fourth floor level on east and west elevation to provide windows to corridor only; (b) window format altered at sixth floor level of south elevation of Blocks A and B; (c) balconies and windows removed from eastern elevation of 4no. apartments at fifth and sixth floor level of Block B due to internal layout requirements related to fire safety; (d) extension of elevator and lift core within Block A from fourth floor to fifth floor level for fire safety purposes, giving an overall height increase of 3.7m; (e) communal lounge extended by 3sqm to connect to extended lift/stair core at fifth floor level; (f) ESB Kiosk (approx. 23.47sqm) at Galtymore Road elevation relocated approximately 6m to the east and redesigned to ESB standards; (g) bin store added to internal layout of ESB substation building (approx. 7.09sqm); (h) bin store (approx. 9.77sqm) added to eastern courtyard; (i) accessible rest room added to guest room at fifth floor level; (j) glazed balconies converted to brick at ground floor level of south elevation and east and west internal courtyard elevations; (k) alteration to glazing at street level of Block B fronting Davitt Road; (l) alterations to selected balconies (8no.) at third and fifth floor to convert from cladding to glazed treatment; and (m) unit layouts of apartments 104 and 110 at first and second floor of block B, fronting Davitt Road, reconfigured to allow sufficient separation distance between proposed balconies and ground floor ESB substation entrance.

KA29N.314091 Liffey Valley to City Centre, County Dublin – Bus Connects On the 15th of July 2022, the National Transport Authority lodged the Liffey Valley to City Centre Core Bus Corridor Scheme Compulsory Purchase Order 2022. The Case is due to be decided by 25/01/2023. Further detail is available at [Home - BusConnects Dublin – Liffey Valley to City Centre \(liffeyvalleyscheme.ie\)](https://www.nra.ie/en/home).

All works will be subject to similar controls as the construction phase of the subject development, with similar outcomes envisaged. However, on its completion, it is anticipated that the proposals where relevant, would be subject to the same requirement to treat and attenuate all rainfall runoff and would therefore likely have a positive and permanent impact on the environment i.e., local hydrology and hydrogeology.

6.11 INTERACTIONS

Please refer to Chapter 16 for Interactions.

6.12 DIFFICULTIES ENCOUNTERED

There were no difficulties encountered for the research and development of this chapter.

6.13 REFERENCES

Greater Dublin Strategic Drainage Study (2005) – Fingal County Council, Dublin City Council, Dún Laoghaire-Rathdown County Council, South Dublin County Council, Wicklow County Council, Kildare County Council, Meath County Council;

The Greater Dublin Region Code of Practice for Drainage Works (2012) – Fingal County Council, Dublin City Council, Dún Laoghaire-Rathdown County Council, South Dublin County Council, Wicklow County Council, Kildare County Council, Meath County Council;

I.S. EN12056: 2000 Gravity Drainage Systems inside Buildings (2000) – National Standards Agency Ireland;

I.S. EN752: 2017 Drain & Sewer Systems outside Buildings (2017) – National Standards Agency Ireland;

Pollution Prevention Guideline PPG3 Use and design of oil separators in surface water drainage systems (2006) – UK Environment Agency;

Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (2009) – National Roads Authority;

Control of Water Pollution from Construction Sites (2001) – Construction Industry Research and Information Association;

Environmental Handbook for Building and Civil Engineering Projects (2000) – Construction Industry Research and Information Association.

7.0 AIR QUALITY AND CLIMATE

7.1 INTRODUCTION

Byrne Environmental Consulting Ltd have assessed the potential air quality and climatic impacts that the project may have on the receiving environment during the construction and operational phases of the project. The assessment includes a comprehensive description of the existing air quality in the vicinity of the subject site; a description and assessment of how construction activities and the operation of the development may impact existing air quality; the mitigation measures that will be implemented to control and minimise the impact that the development may have on local ambient air quality and reduce the impact on the local micro climate; and, finally, a description as to how the development will be constructed and operated in an environmentally sustainable manner.

7.2 STUDY METHODOLOGY

7.2.1 Legislation and Guidelines

The general assessment methodology of the potential impact of the project on air quality and climate has been conducted in accordance with:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DoHPLG, August 2018)
- Guidelines on information to be contained in Environmental Impact Assessment Reports (EPA, 2022)
- Guidelines on Information to be Contained in an Environmental Impact Statement (EPA 2002).
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003).
- Revised Guidelines on the Information to be Contained in Environmental Impact Statements (EPA 2015).
- Planning and Development Regulations 2001, as amended, in particular by the European Union (Planning & Development)(Environmental Impact Assessment) Regulations 2018 (SI No. 296 of 2018).
- Environmental Impact Assessment of Projects – Guidance on the preparation of the EIAR, European Commission, 2017.
- Climate Action and Low Carbon Development Act 2015
- The Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (2011)
- Institute of Environmental Management and Assessment (IEMA) guidance note on ‘Assessing Greenhouse Gas Emissions and Evaluating their Significance’ (IEMA, 2022)
- Directive 2011/92/EU of the European Parliament and Council of the 13th December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) as amended by Directive 2014/52/EU of the European Parliament and Council of the 16th April 2014

7.2.2 Air Quality Assessment Methodology

7.2.1.1 Legislation and Guidance

Air quality standards and guidelines are available from a number of sources. The guidelines and standards referenced in this report include those from Ireland and the European Union.

In order to reduce the risk to health from poor air quality, National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or “*Air Quality Standards*” are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (Ref Table 7.1).

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the National Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011), which implement European Commission Directive 2008/50/EC which has set limit values for the pollutants SO₂, NO₂, PM₁₀, benzene and CO. Council Directive 2008/50/EC replaces the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC). Provisions are also made for the inclusion of new ambient limit values relating to PM_{2.5}. The European 2008/50/EC Clean Air for Europe (CAFÉ) Directive is the current air quality directive for Europe which supersedes the European Directives 1999/30/EC and 2000/69/EC. The Directive is implemented by the Air Quality Standards Regulations 2011 which replace the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999.

In order to assess a wider range of air pollutants in the development area it is necessary to review current air quality monitoring data from published sources such as the most recent EPA's 2019 Annual report entitled Air Quality in Ireland. This EPA report provides detailed monitoring data collected from a number of monitoring locations throughout Ireland on an annual basis to assess national compliance with National Air Quality Regulations. Given the location of the site within Dublin city it is characterised as a Zone A area as defined by the EPA.

EU legislation on air quality requires that Member States divide their territory into zones for the assessment and management of air quality. The zones currently in place in Ireland are as follows:

- Zone A is the Dublin conurbation,
- Zone B is the Cork conurbation
- Zone C comprising 23 large towns in Ireland with a population >15,000.
- Zone D is the remaining area of Ireland.

The air quality in each zone is assessed and classified with respect to upper and lower assessment thresholds based on measurements over the previous five years. Upper and lower assessment thresholds are prescribed in the legislation for each pollutant. The number of monitoring locations required is dependent on population size and whether ambient air quality concentrations exceed the upper assessment threshold, are between the upper and lower assessment thresholds, or are below the lower assessment threshold. A summary of the EPA's Annual report entitled Air Quality in Ireland 2019 is detailed below.

Table 7.1 – Air Quality Standards Regulations 2011 (based on EU Council Directive 2008/50/EC)

Pollutant	Regulation	Limit Criteria	Tolerance	Limit Value
Nitrogen Dioxide	2008/50/EC	Hourly limit for the protection of human health – not to be exceeded more than 18 times/year	40% until 2003 reducing linearly to 0% by 2010	200 µg/m ³
		Annual limit for the protection of human health	40% until 2003 reducing linearly to 0% by 2010	40 µg/m ³
		Annual limit for the protection of vegetation	None	400 µg/m ³ NO & NO ₂
Lead	2008/50/EC	Annual limit for the protection of human health	100%	0.5 µg/m ³
Sulphur Dioxide	2008/50/EC	Hourly limit for protection of human health – not to be exceeded more than 24 times/year	150 µg/m ³	350 µg/m ³
		Daily limit for protection of human health – not to be exceeded more than 3 times/year	None	125 µg/m ³
			None	20 µg/m ³
		Annual and Winter limit for the protection of ecosystems		
Particulate Matter PM ₁₀	2008/50/EC	24-hour limit for protection of human health – not to be exceeded more than 35 times/year	50%	50 µg/m ³
			20%	40 µg/m ³

Pollutant	Regulation	Limit Criteria	Tolerance	Limit Value
		Annual limit for the protection of human health		
Particulate Matter PM _{2.5} Stage 1	2008/50/EC	Annual limit for the protection of human health	20% from June 2008. Decreasing linearly to 0% by 2015	25 µg/m ³
Particulate Matter PM _{2.5} Stage 2	2008/50/EC	Annual limit for the protection of human health	None	20 µg/m ³
Benzene	2008/50/EC	Annual limit for the protection of human health	20% until 2006. Decreasing linearly to 0% by 2010	5 µg/m ³
Carbon Monoxide	2008/50/EC	8-hour limit (on a rolling basis) for protection of human health	60%	10 mg/m ³
Dust Deposition	German TA Luft Air Quality Standard Note 1	30 Day Average	None	350 mg/m ² /day

Note 1 Dust levels in urban atmospheres can be influenced by industrial activities and transport sources. There are currently no national or European Union air quality standards with which these levels of dust deposition can be compared. However, a figure of 350 mg/m²-day (as measured using Bergerhoff type dust deposit gauges as per German Standard Method VDI 2129 for determination of dust deposition rate, is accepted as best practice to ensure that no nuisance effects will result from industrial or construction activities.

Table 7.2 – World Health Organisation Air Quality Guidelines (non-mandatory)

Pollutant	Limit Parameter	Value
Nitrogen Dioxide	Hourly Limit	200 µg/m ³
	Annual Limit	40 µg/m ³
Sulphur Dioxide	24-hour limit	20 µg/m ³
	10-minute limit	500 µg/m ³
Particulate Matter PM ₁₀	24-hour limit	50 µg/m ³
	Annual Limit	20 µg/m ³
Particulate Matter PM _{2.5}	24-hour limit	25 µg/m ³
	Annual Limit	10 µg/m ³

Table 7.3 – EPA 2020 Assessment Zone A Classification

Pollutant (Annual Mean)	EPA 2019 Assessment Classification
NO ₂ Zone A	Below lower assessment threshold)
SO ₂ Zone A	Below lower assessment threshold
CO Zone A	Below lower assessment threshold
Ozone Zone A	Below long term objective
PM ₁₀ Zone A	Below lower assessment threshold
PM _{2.5} Zone A	Below lower assessment threshold
Benzene	Below lower assessment threshold

Pollutant (Annual Mean)	EPA 2019 Assessment Classification
Zone A	
Heavy Metals (As, Ni, Cd, Pb) Zone A	Below lower assessment threshold
Poly Aromatic Hydrocarbons (PAH) Zone A	Below lower assessment threshold

7.2.1.2 Construction Impact Assessment Criteria

Transport Infrastructure Ireland's 'Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes' (Revision 1, 2011) states that "it is very difficult to accurately quantify dust emissions arising from construction activities" and that "it is thus not possible to easily predict changes to dust soiling rates or PM10 concentrations." The guidance advises the use of a semi-quantitative approach to determine the likelihood of a significant impact which should be combined with an assessment of the proposed mitigation measures.

The construction assessment criteria, reproduced from the TII guidance, are set out in Table 7.4 below.

Table 7.4 – Assessment criteria for the impact of duct emissions from construction activities with standard mitigation in place (TII 2011)

Source		Potential distance for significant effects (distance from source)		
Scale	Description	Soiling	PM ₁₀	Vegetation effects
Major	Large construction sites, with high use of haul 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

The impact of construction related dust emissions is assessed by estimating the area over which there is a risk of significant impacts as per the TII guidance. The significance of impact is assessed in terms of the significance criteria outline in the EPA's 2022 Guidelines on the information to be contained in Environmental Impact Assessment Reports.

In relation to construction related traffic, air quality significance criteria are assessed on the basis of compliance with the appropriate standards air limit values. The Air Quality Standards Regulations 2011 replace the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999.

7.2.1.3 Operational Impact Assessment Criteria

Once operational, the proposed residential development at Emmett Road has the potential to impact on local air quality as a result of the requirements of new buildings to be heated and with the increased traffic movements associated with the development.

Air quality significance criteria are assessed on the basis of compliance with the national air quality limit values. The Air Quality Standards Regulations 2011 replace the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999.

7.2.2 Climate Assessment Methodology

Climate has implications for many aspects of the environment from soils to biodiversity and land use practices. The proposed development may impact on both the macro-climate and micro-climate. The macro-climate is the climate of a large geographic area such as Ireland. The micro-climate refers to the climate in the immediate area.

The micro-climatic impacts of wind are considered with regard to the Microclimatic Wind Analysis and Pedestrian Comfort Report. This wind analysis was undertaken by IN2 Consulting Engineers and a copy of the Report is submitted with the application.

The impact of the proposed scheme upon the macro-climate is assessed through the consideration of the change in CO₂ emissions that will occur due to the changes in traffic flow that occur in response to the proposed scheme.

The Conference of the Parties to the Convention (COP26) occurred in Glasgow in November 2021 with the following outcomes.

7.2.2.1 Emissions

One of the key aims of COP26 was to create a timetable for agreeing to more ambitious National Determined Contributions (NDCs), as the current NDCs are inadequate to limit temperature rises to 1.5C and, prior to COP26, nations were only required to set new NDCs every five years. While only one major emitter - India - produced a new NDC at COP26, the aim of the summit was not for numerous countries to produce new NDCs, but to agree to the faster roadmap. The Glasgow Climate Pact ensures that the question of revising NDCs will be discussed at COP27 in Egypt in 2022 and again for the following COP in 2023, providing a lever for more ambitious countries to ensure slower countries make the step up.

7.2.2.2 Fossil Fuels

The use of coal provided the most contentious moment of the negotiations, as India and China insisted on changing the wording of the final text from a commitment to “phase out” coal power to “phase down” coal power, which the EU and US both accepted, angering the UK and smaller island nations. However, it is notable that this is the first COP agreement that has made a direct reference to phasing down fossil fuels, including a statement that inefficient subsidies for all fossil fuels should be removed and an acknowledgement of the need for a “just transition” to a clean energy system. Nations are also “invited” to reduce methane emissions this decade, again the first-time methane has been mentioned in a COP final agreement.

7.2.2.3 Climate Finance and Adaption

In 2009, it was agreed that developing nations would receive at least \$100bn a year from public and private sources to help them cut emissions and cope with the impacts of the climate crisis. However, in 2019, it was found that only \$80bn had been made available, and the Glasgow Climate Pact urges developed countries to “fully deliver” the \$100bn goal through to 2025. The Glasgow Climate Pact also agrees to double the proportion of climate finance going towards adaptation following pressure from developing nations who argue that too much of climate finance is spent on funding emissions-cutting projects in middle-income countries that don't need the funding.

7.2.2.4 Loss and Damage

The EU and the US reportedly managed to veto the expansion of the loss and damage finance facility from the final agreement. The facility originated at the Paris Agreement and was designed to provide financial assistance for developing countries to deal with environmental damage incurred as a result of climate change. Going into the negotiations, nations including China and the G77, which represents 134 developing and emerging economies, expressed frustration that no further financial commitments to combatting loss and damage had been made. Despite this lack of progress, the Pact does confirm that a “technical assistance facility” will be introduced to support loss and damage in relation to climate change in developing countries and will fall under the Santiago Network from the UNFCCC.

7.2.2.5 Carbon Markets

The Glasgow Climate Pact also resolves some key issues in Article 6 of the Paris Agreement, the section pertaining to carbon markets and how emissions reductions under NDCs can and should be accounted for. The final text states that carbon offsetting should rely on “real, verified and additional” emissions removal taking place from 2021 onward and there is a requirement for co-benefits in terms of adaptation and the economy, and for nations to put at least 5% of the proceeds into adaptation. Plans for a potential two-tier system, and to transfer existing forest credits into Article 6, were deleted from drafts, in a move most green groups have praised.

7.2.2.6 Reaffirming the Paris Agreement

Prior to the summit, some nations opposed to stronger action had criticised the focus at COP26 on 1.5C as “*reopening the Paris agreement*”, the main goal of which is to hold temperature rises “well below” 2C above pre-industrial levels while “pursuing efforts” to limit rises to 1.5C.

European Commission Directive 2001/81/EC, the National Emissions Ceiling Directive (NECD) (2014), prescribes the same emission limits as the 1999 Gothenburg Protocol. A National Programme for the progressive reduction of emissions of these four transboundary pollutants has been in place since April 2005 (DEHLG, 2007a; 2004). Data available from the EU in 2010 indicated that Ireland complied with the emissions ceilings for SO₂, VOCs and NH₃ but failed to comply with the ceiling for NO_x (EEA, 2012). Directive (EU) 2016/2284 “On the Reduction of National Emissions of Certain Atmospheric Pollutants and Amending Directive 2003/35/EC and Repealing Directive 2001/81/EC” was published in December 2016. The Directive will apply the 2010 NECD limits until 2020 and establish new national emission reduction commitments which will be applicable from 2020 and 2030 for SO₂, NO_x, NMVOC, NH₃, PM_{2.5} and CH₄. In relation to Ireland, 2020-29 emission targets are for SO₂ (65% below 2005 levels), for NO_x (49% reduction), for VOCs (25% reduction), for NH₃ (1% reduction) and for PM_{2.5} (18% reduction). In relation to 2030, Ireland’s emission targets are for SO₂ (85% below 2005 levels), for NO_x (69% reduction), for VOCs (32% reduction), for NH₃ (5% reduction) and for PM_{2.5} (41% reduction).

The following guidelines and EU Directives relating to Climate Change aspects of EIA reports have been applied to this assessment in order to determine the potential impacts/effects that the proposed development may have on climate change.

- EPA Guidelines on information to be contained in Environmental Impact Assessment Reports 2022
- European Union (Planning & Development)(Environmental Impact Assessment) Regulations 2018 (SI No. 296 of 2018)
- Directive 2011/92/EU of the European Parliament and Council of the 13th December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) as amended by Directive 2014/52/EU of the European Parliament and Council of the 16th April 2014
- The Irish Building Regulations Technical Guidance Document L – Conservation of Fuel & Energy – Dwellings amended in 2017 includes requirements for all residential dwellings to be “Nearly Zero Energy Buildings” (NZEB’s) by 31st December 2020.
- Ireland’s National Energy and Climate Plan 2021 - 2030

In order to meet the commitments under the Paris Agreement, the EU enacted Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013 (the Regulation). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. Ireland’s obligation under the Regulation is a 30% reduction in non-ETS greenhouse gas emissions by 2030 relative to its 2005 levels.

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the 2015 Act). The purpose of the Act was to enable Ireland ‘to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050’ (Section 3(1) of the 2015 Act. This is referred to in the Act as the ‘national transition objective’. The Act made provision for, inter alia, a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations. The 2015 Act was amended by the Climate Action and Low Carbon Development (Amendment) Act 2021 (the 2015 Act as amended).

The key duty imposed on planning authorities by section 15 of the Climate Action and Low Carbon Development Act 2015 (as amended) is:

- 1) A relevant body [e.g., a planning authority] shall, in so far as practicable, perform its functions in a manner consistent with—
 - (a) the most recent approved climate action plan,
 - (b) the most recent approved national long term climate action strategy,
 - (c) the most recent approved national adaptation framework and approved sectoral adaptation plans,
 - (d) the furtherance of the national climate objective, and
 - (e) the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State.”

The 2019 Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019a). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector

to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the next Climate Action Plan in November 2021 (Government of Ireland, 2021a). The plan contains similar elements as the 2019 CAP and aims to set out how Ireland can reduce our greenhouse gas emissions by 51% by 2030 (compared to 2018 levels) which is in line with the EU ambitions, and a longer-term goal of to achieving net-zero emissions no later than 2050. The 2021 CAP outlines that emissions from the Built Environment sector must be reduced to 4 -5 MtCO_{2e} by 2030 in order to meet our climate targets. This will require further measures in addition to those committed to in the 2019 CAP. This will include phasing out the use of fossil fuels for the space and water heating of buildings, improving the fabric and energy of our buildings, and promoting the use of lower carbon alternatives in construction.

Following on from Ireland declaring a climate and biodiversity emergency in May 2019 and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme for the Climate Action (Amendment) Bill 2019 in December 2019 (Government of Ireland 2019b) followed by the passing of the Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021) (hereafter referred to as the 2021 Climate Act) in July 2021 (Government of Ireland, 2021b). The 2021 Climate Act was prepared for the purposes of giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act is to provide for the approval of plans ‘for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050’. The 2021 Climate Act will also ‘provide for carbon budgets and a decarbonisation target range for certain sectors of the economy’. The 2021 Climate Act defines the carbon budget as ‘the total amount of greenhouse gas emissions that are permitted during the budget period’. The 2021 Climate Act removes any reference to a national mitigation plan and instead refers to both the Climate Action Plan, as published in 2019, and a series of National Long Term Climate Action Strategies. In addition, the Environment Minister shall request each local authority to make a ‘local authority climate action plan’ lasting five years and to specify the mitigation measures and the adaptation measures to be adopted by the local authority.

7.3 RECEIVING ENVIRONMENT (BASELINE SCENARIO)

The subject development site is located in an area which includes, healthcare, educational and residential development. It is situated between Emmet Road to the north of the site, Goldenbridge Cemetery to the south, St. Vincent’s Street West and a local access road to the east serving Thornton Heights apartments, and a HSE facility.

Refer to the detailed description in Section 2 of this EIAR.

The general area surrounding the subject site is currently comprised of residential, retail and commercial developments which will generate emissions to air associated with heating. The local road network will also have an impact on local air quality arising from combustion engine emissions.

7.3.1 Description of Existing Air Quality

The existing ambient air quality in the vicinity of the site has been characterised with information obtained from a number of sources as follows:

- Environmental Protection Agency’s Annual Air Quality in Ireland Report 2020,
- Site specific air quality monitoring surveys;
-

The ambient air quality data collected and reviewed for the purpose of this study focused on the principal substances (dust, vehicle exhaust emissions and boiler emissions) which may be released from the site during the construction and operation phases and which may exert an influence on local air quality.

The existing ambient air quality at and in the vicinity of the site is typical of an urban location and as such, domestic and commercial heating sources and road traffic are identified as the dominant contributors of hydrocarbon, combustion gases and particulate emissions to ambient air quality.

7.3.2 Trends in air quality

Annual air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality "Air Quality in Ireland 2020 (Published 2021) details the range and scope of monitoring undertaken throughout Ireland. The Dublin Conurbation is categorised as Zone A.

The most recent 2020 EPA publication includes a number of Zone A monitoring locations which would be comparable to the expected air quality at the subject site at Emmet Road. The various Zone A air quality monitoring stations within Dublin provide a comprehensive range of air quality monitoring data sets which have been selected as part of this assessment to describe the existing ambient air quality at the subject site.

7.3.3 Nitrogen Dioxide

The Air Quality Standards Regulations 2011 specify a limit value of 40 µg/m³, for the protection of human health, over a calendar year. The standard, taken from the 2008 CAFÉ Directive 2000/69/EC, came into force in 2011.

Long term NO₂ monitoring was carried out at 13 Zone A locations in 2020. The NO₂ annual mean for these sites ranged from 11 - 30 µg/m³ compared against the annual average limit of 40 µg/m³.

7.3.4 Sulphur Dioxide

The Air Quality Standards Regulations 2011 specify an annual limit value of 20µg/m³ for the protection of human health. The standard, taken from the 2008 CAFÉ Directive 2000/69/EC, came into force in 2011.

Long term SO₂ monitoring was carried out at 5 Zone A locations in 2020. The annual SO₂ daily means in 2020 for these sites ranged from 1.4 – 5.2 µg/m³.

7.3.5 Carbon Monoxide

The Air Quality Standards Regulations 2011 specify an 8-hour limit value (on a rolling basis) for the protection of human health of 10,000 µg/m³. The standard, taken from the 2008 CAFÉ Directive 2000/69/EC, came into force in 2011.

Long term CO monitoring was carried out at 2 Zone A location in 2020. The 8-hour CO concentrations were 300µg/m³ which is below the 8-hour limit value (on a rolling basis) of 10,000 µg/m³.

7.3.6 Particulate Matter PM10

The Air Quality Standards Regulations 2011 specify a PM10 limit value of 40 µg/m³ over a calendar year. The standard, taken from the 2008 CAFÉ Directive 2000/69/EC, came into force in 2011.

Long term PM10 monitoring was carried out at 15 Zone A locations in 2020. The PM10 annual mean in 2020 for these sites ranged from 10 - 20µg/m³.

7.3.7 Particulate Matter PM2.5

The Air Quality Standards Regulations 2011 specify a PM2.5 limit value of 25 µg/m³ over a calendar year.

Long term PM2.5 monitoring was carried out at 15 Zone A locations in 2020. The PM2.5 average in 2020 for these sites ranged from 6 - 9µg/m³.

Table 7.5 – Summary of the 2019 Air Quality data obtained from Zone A area

Pollutant	Regulation	Limit type	Limit value	EPA monitoring data 2019
Nitrogen dioxide	2008/50/EC	Annual limit for protection of human health	40 µg/m ³	11 - 30 µg/m ³
Sulphur dioxide	2008/50/EC	Daily limit for protection of human health (not to be exceeded more than 3 times per year)	125 µg/m ³	0.1.4 – 5.2 µg/m ³
Carbon monoxide	2008/50/EC	8-hour limit (on a rolling basis) for protection of human health (Zone C)	10,000 µg/m ³	300 µg/m ³
Particulate matter (as PM ₁₀)	2008/50/EC	Annual limit for protection of human health	40 µg/m ³	10 - 20 µg/m ³
Particulate matter (as PM _{2.5})	2008/50/EC	Annual limit for protection of human health	25 µg/m ³	6 - 9 µg/m ³
Benzene	2008/50/EC	Annual limit for protection of human health	5 µg/m ³	< 0.52µg/m ³

7.3.8 Site Specific Baseline air quality monitoring

A site-specific short-term monitoring study was conducted for Nitrogen Dioxide, Sulphur Dioxide and dust deposition at the site using passive diffusion tubes over a two-week period and dust deposition gauges for a 30-day period. Figure 7.2 identifies the monitoring locations. The baseline survey was conducted during January 2021.

These locations were chosen in order to obtain representative short-term sample concentrations for the identified parameters.

The survey was indicative only and results obtained cannot be used to demonstrate compliance with short-term or annual limit values detailed in Table 7.1 above. The results are however within the concentration range of EPA long-term air quality data in this zone. The results from the monitoring surveys are presented in Table 7.6.

The concentrations of NO₂, SO₂ and dust deposition levels measured during the short-term measurement survey were below their respective annual limit values and comparable with levels reported by the EPA.

Table 7.6 – Results of passive diffusion tube monitoring at Emmet Road development site

Pollutant	Sampling period	Measured Concentration A1	Assessment criteria
Nitrogen dioxide	January 2021	A1 31.30µg/m ³	40 µg/m ³ (as annual average)
Sulphur Dioxide	January 2021	A1 <2.47µg/m ³	20 µg/m ³ (as annual average)
Dust Deposition	January 2021	A1 287 mg/m ² -day	350 mg/m ² -day (as monthly average)

Note 1: Gradko Environmental Test Certificate 006445R

Note 2: City Analysts Test Certificate 2074577

7.3.9 Review of EPA modelled NO₂, PM₁₀ and PM_{2.5}

The EPA's unified GIS Framework provides traffic emission data based on traffic volumes and the proximity of receptors to the source, in this case the local road network in the Inchicore area. Figures 7.2 to 7.4 present the EPA modelled concentration contours for NO₂, PM₁₀ and PM_{2.5} with an associated concentration for each at the Emmet Road site. The EPA data indicates that air quality parameters at the Emmet Road site are below the Air Quality Standards for NO₂, PM₁₀ and PM_{2.5}.

Figure 7.1 – Site specific baseline air quality monitoring location A1



Figure 7.2 – NO₂ < 28 µg/m³

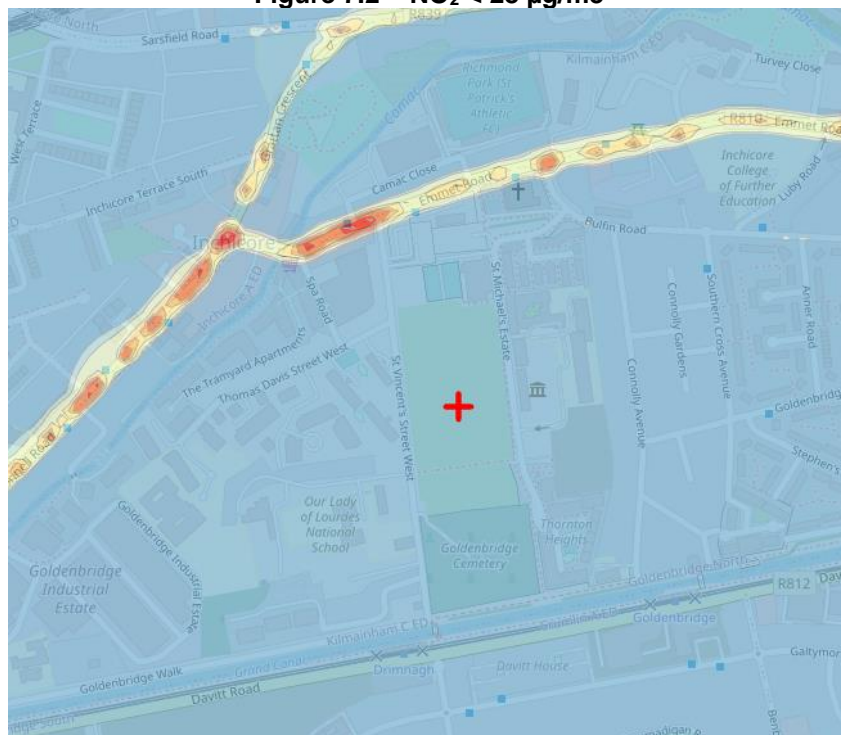


Figure 7.3 – PM10 <math><12 \mu\text{g}/\text{m}^3</math>

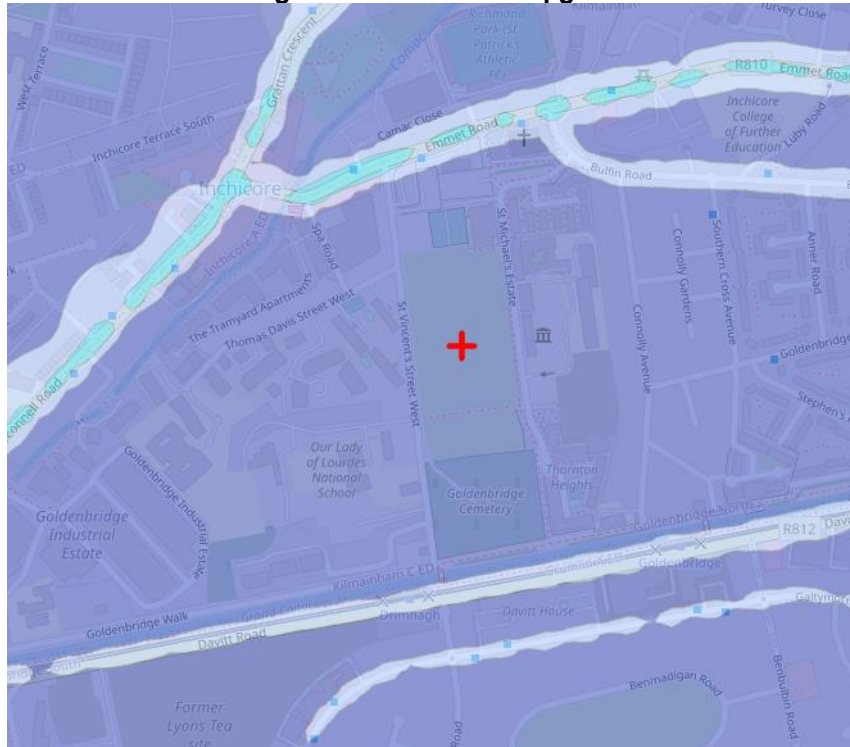
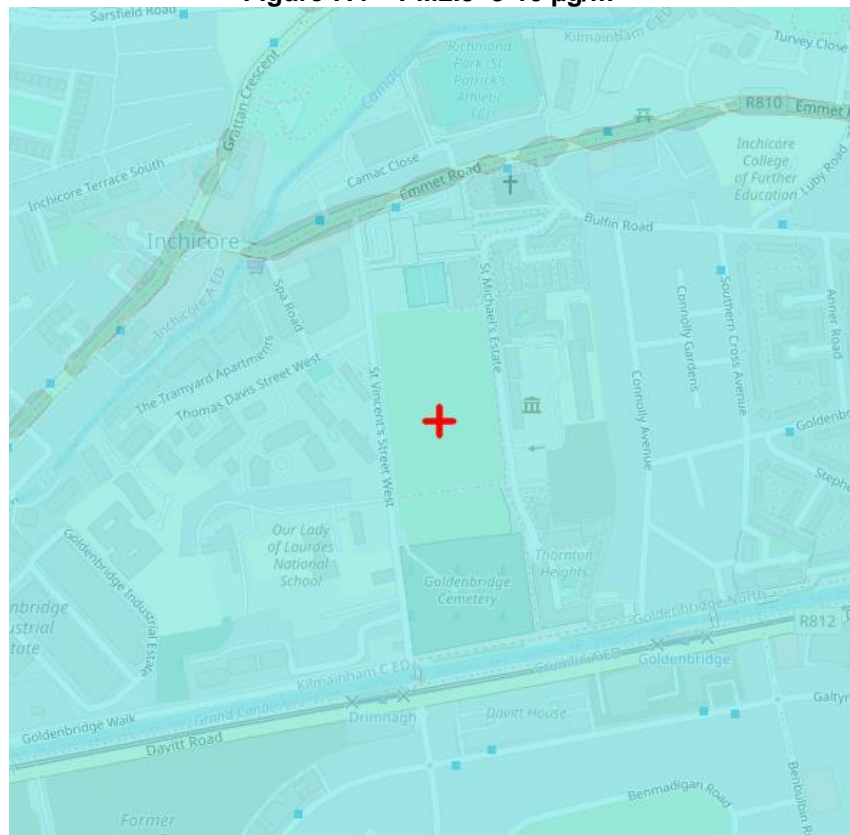


Figure 7.4 – PM2.5 8-10 $\mu\text{g}/\text{m}^3$



7.3.10 Significance

Based on published 2020 EPA air quality data for the Zone A (Dublin) area in which the subject site is located together with site specific monitoring data and a review of the EPA's GIS Framework modelling data, it may be concluded that the existing baseline air quality at the subject site may be characterised as being good with no exceedances of the National Air Quality Standards Regulations 2011 (S.I No. 180 of 2011) limit values of individual pollutants. There is therefore currently sufficient atmospheric budget to accommodate the development without adversely impacting existing ambient air quality. The quality of existing air quality at the subject site must be maintained and improved where possible as a result of the proposed development to ensure that local human health and the receiving environment is not adversely affected.

7.4 EXISTING CLIMATE RECEIVING ENVIRONMENT (BASELINE SCENARIO)

The nearest synoptic meteorological station to the subject site is at Dublin Airport which is located approximately 10km north of the Emmet Road site and as such, long-term measurements of wind speed/direction and air temperature for this location are representative of prevailing conditions experienced at the subject site. Recent meteorological data sets for Dublin Airport were obtained from Met Éireann for the purposes of this assessment study.

7.4.1 Rainfall

Precipitation data from the Dublin Airport meteorological station for the period 2011-2021 indicates a mean annual total of about 762 mm. This is within the expected range for most of the eastern half of the Ireland which has between 750 mm and 1000 mm of rainfall in the year.

7.4.2 Temperature

The annual mean temperature at Dublin Airport (2011-2021) is 9.5°C with a mean maximum of 15.3°C and a mean minimum of 4.0°C. Given the relatively close proximity of this meteorological station to the proposed development site, similar conditions would be observed. Table 7.7 sets out meteorological data for Dublin Airport from 2011-2021.

Table 7.7 – Meteorological Data for Dublin Airport 2011-2021

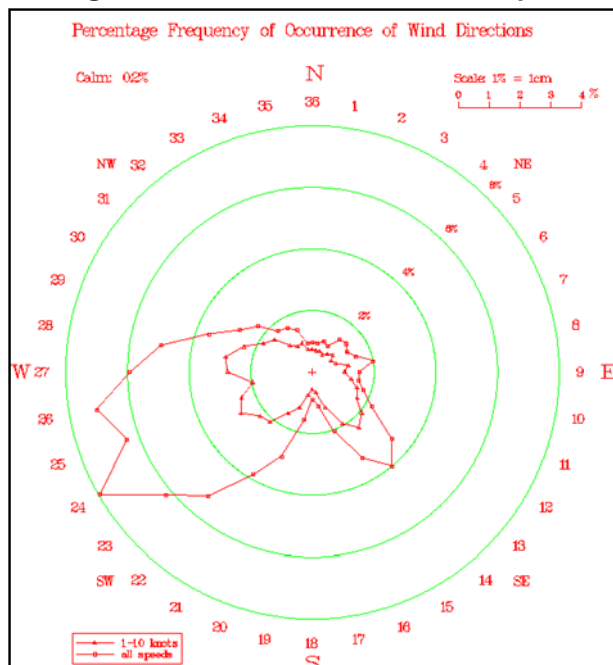
Year	Period	Rainfall (mm)	Maximum mean Temperature (°C)	Minimum mean Temperature (°C)	Mean Temperature (°C)
2011	Annual Mean	672	16.7	3.1	9.4
2012	Annual Mean	850	15.3	5.4	9.3
2013	Annual Mean	764	14.0	3.6	9.9
2014	Annual Mean	870	15.8	5.4	10.6
2015	Annual Mean	766	14.0	4.0	9.0
2016	Annual Mean	725	15.7	4.4	10.1
2017	Annual Mean	661	15.0	5.3	9.9
2018	Annual Mean	709	14.8	4.8	9.7
2019	Annual Mean	886	15.9	5.1	9.6
2020	Annual Mean	749	15.7	5.0	9.8
2021	Annual Mean	661	15.5	6.0	10.1
Mean		767	15.3	4.0	9.5

Data supplied by Met Éireann

7.4.3 Wind

Wind is of key importance for both the generation and dispersal of air pollutants. Meteorological data for Dublin Airport indicates that the prevailing wind direction, in the Dublin area, is from the West and Southwest and blows Northeast across the proposed development. The mean annual wind speed in the Dublin area between 2009 - 2021 is 5.7 m/s.

Figure 7.5 – Windrose for Dublin Airport



7.5 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The development includes the construction of a residential and mixed-use scheme on the former Saint Michael's Estate. The site is bounded to the north by Emmet Road, to the south by Goldenbridge cemetery to the east by Richmond Barracks and the pedestrian link to the Bulfin estate next to Saint Michael's Church and to the west by Saint Vincent Street West.

The development proposed is predominantly residential in nature, comprising c. 578 no. residential units, a creche, retail/retail service units, supermarket, community hub/library and landscaped areas as well as upgrade works to the water main along Emmet Road to the junction of Tyrconnell Road/Grattan Crescent.

The related Part 8 development comprising the demolition of the structures located in the northern part of the site is included in the assessment (Reg. Ref 2221/21 Part 8 Development).

A full description of the development is provided in Chapter 2 of this EIAR.

7.6 POTENTIAL IMPACTS/EFFECTS OF THE PROPOSED DEVELOPMENT

7.6.1 Potential Impacts/effects – Construction Phase

7.6.1.1 Air quality

The development of the site will be conducted in the following phased stages:

- Enabling works - Site set up and Site clearance including demolition of structures and buildings (Planning Ref 2221/21 Part 8 Development)
- Construction works including site infrastructure, houses, apartments commercial buildings and landscaping

Construction impacts/effects associated with both of these phased stages are considered below.

7.6.1.2 Enabling works - Site Set Up and Clearance

Works activities associated with the 'Site set up' will be undertaken prior to construction works commencing in each sub-phase. The setting up of the site shall involve the construction of site security hoarding and site compounds, site offices, materials and waste storage areas and staff welfare facilities. These temporary activities will have a minimal potential to generate fugitive dust emissions or combustion gas emissions.

Site clearance, building and structure demolition and ground excavation works will be undertaken in separate phases and these activities have the potential to generate fugitive windblown dust emissions rising from the operation of mechanical plant such as dozers, excavators and tipper trucks and the movement of these vehicles on exposed surfaces at the site. Infrastructural works will be required to facilitate site services.

With regard to the volume of waste material (top and sub soils) generated during site clearance, there will be a requirement for HGV trucks to remove the material from the site. Stripped top-soils shall be stockpiled and covered on site for re-use during final landscaping works. Trucks shall be loaded with material on-site by mechanical excavators and loading shovels which will generate fugitive dust emissions as a result of the transfer of the excavated materials comprised principally of soils and stones from stockpile to truck.

The movements of construction vehicles on the site shall also generate windblown dust emissions. Where dusty waste material is loaded onto exposed open trucks, fine dusts may be released as the truck travels along public roads.

7.6.1.3 Building and Site Infrastructure Construction Works

During the construction phase there will be extensive site works, involving construction machinery, construction activities on site which have the potential to generate fugitive windblown dust emissions.

Construction equipment including generators and compressors will also give rise to diesel and petrol engine exhaust emissions.

Construction traffic to and from the site shall result in a short-term increase in the volume of diesel fuelled HGV's along the local road network which will generate additional hydrocarbon and particulate emissions from the vehicle exhausts.

Climate

During the construction phase CO₂ will be released into the atmosphere as a result of the movement of construction vehicles and the use of construction plant including generators and cranes.

7.6.2 Potential Operational Phase Impacts/effects

7.6.2.1 Air quality

The operational phase of the proposed development has the potential to have a slight, long-term impact on local air quality as a result of the requirements for new buildings to be heated and with the increased traffic movements associated with the development.

Traffic movements associated with the development have been evaluated and assessed as part of the Traffic Impact Assessment for the development up to 2036 (Opening Year + 15) which includes parking for vehicles which will enter and exit the site. The split in am and pm peak traffic movements may increase the impact on local air quality at the junctions.

7.6.2.2 Climate

The overall site area of the development lands is c. 4.68 hectares will include open space, and landscaped areas. The overall development includes the construction of buildings and roadways which may have the potential effect of marginally raising localised air temperatures, especially in summer.

The proposed development includes apartment structures which may impact on the local micro-climate by means of wind shear effects.

Motor vehicles are a major source of atmospheric emissions which contribute to climate change and vehicle exhaust emissions may have a potential to impact the macro-climate.

7.7 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

This section provides the measures that shall be implemented during the construction and operational phases of the development and into the design of the development to minimise the impacts/effects on ambient air quality in the receiving environment, on local population and human health, on local flora and fauna and on climate.

7.7.1 Demolition Phase

Pending the results of an asbestos survey of the Part 8 buildings to be demolished at the development site, a licensed asbestos contractor shall be appointed to remove all asbestos containing materials (ACM's) in accordance with the Health and Safety Authority's Guidelines on ACM Management and Abatement.

Demolition activities including concrete breaking shall include the use of water suppression techniques to minimise the generation of dust.

7.7.2 Construction Phase

- Use of rubble chutes and receptor skips during construction activities.
- During dry periods, dust emissions from heavily trafficked locations (on and off site) will be controlled by spraying surfaces with water and wetting agents.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic only.
- Re-suspension in the air of spillages material from trucks entering or leaving the site will be prevented by limiting the speed of vehicles within the site to 10kmh and by use of a mechanical road sweeper.
- The overloading of tipper trucks exiting the site will not be permitted.
- Aggregates will be transported to and from the site in covered trucks.
- Where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser.
- Wetting agents shall be utilised to provide a more effective surface wetting procedure.
- Exhaust emissions from vehicles operating within the construction site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, rather than just following breakdowns; the positioning of exhausts at a height to ensure adequate local dispersal of emissions, the avoidance of engines running unnecessarily and the use of low emission fuels.
- All plant not in operation shall be turned off and idling engines shall not be permitted for excessive periods.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- Material stockpiles containing fine or dusty elements including top soils shall be covered with tarpaulins.
- Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used to prevent unnecessary dust emissions by the erection of wind breaks or barriers. All concrete cutting equipment shall be fitted with a water dampening system.
- A programme of air quality monitoring shall be implemented at the site boundaries for the duration of construction phase activities to ensure that the air quality standards relating to dust deposition and PM10 are not exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented.
- A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.
- Dust netting and site hoarding shall be installed along the north, south, east and western site boundaries to minimise the propagation of fugitive windblown dust emissions falling on third party lands and existing residential areas.

7.7.3 Operational Phase

The Operational Phase of the Emmet Road mixed use development will not generate air emissions that would have an adverse impact on local ambient air quality or local human health.

The operational phase includes mitigation by design of the development to minimise the impact of the operational phase of the development on air quality and climate are as follows:

AC-O1 Climate Impact Mitigation Measures by Design

- Energy Efficiency – All residential units shall be designed and constructed in accordance with The Irish Building Regulations Technical Guidance Document L – Conservation of Fuel & Energy – Dwellings amended in 2017 includes requirements for all residential dwellings to be “Nearly Zero Energy Buildings” (NZEB’s) by 31st December 2020.
- Energy Consumption - The following key design features have been integrated into the design and construction of the residential units to reduce energy consumption:
 - Photovoltaic Cells will be installed on all roofs
 - The use of green building materials: low embodied energy & recycled materials will be utilised where possible
 - Energy efficient window units and frames with certified thermal performance shall be used
 - Building envelope air tightness will reduce the loss of warm air to the external environment
 - Installation of Exhaust Air Heat Pump systems in all units which operate by extracting warm air from kitchens and bathrooms, cleaning it and distributing it to other rooms in the unit.
 - Thermal insulation of walls and roof voids of all units

AC-O2 Air Quality Mitigation Measures

- A centralised air source heat pump is proposed to provide the heating load to the development.
- Inclusion of electric car charging points to encourage electric vehicle ownership
- There will be reduced car-parking at the development site given the quality of and proximity to Public designed for walking and cycling and the provision of a mobility hub.
- Provision of open landscaped areas, to encourage residents to avail of active lifestyle options and which will contribute albeit in a minor way to the adsorption of Carbon Dioxide from the atmosphere and the release of Oxygen into the atmosphere.

7.8 PREDICTED IMPACTS/EFFECTS OF THE PROPOSED DEVELOPMENT

7.8.1 Predicted Construction Phase Impacts/effects

Various elements associated with the construction phase of the proposed development have the potential to impact local ambient air quality, human health and climate. However, the potential construction phase impacts will be mitigated as detailed above to ensure there is no adverse impact on ambient air quality for the duration of all construction phase works. It is predicted that the operational phase of the development will not generate air emissions that would have an adverse impact on local ambient air quality or on local human health or on the local micro-climate or the wider macro-climate. Table 7.8 below summarises the identified likely residual effects of the project during the construction phase.

Table 7.8 – Summary of Construction Phase Likely Significant Effects with Mitigation

Likely Effect	Significant	Quality	Significance	Extent	Probability	Duration	Type
Construction Air Quality	Phase	Negative	Slight	Local	Likely	Short-Term	Residual
Construction Climate	Phase	Negative	Imperceptible	Local	Likely	Short-Term	Residual

With regard to the predicted cumulative construction phase impacts/effects, the subject development together with all other proposed developments in the local area will require a Construction Environmental Management Plan detailing how construction phase air emissions shall be controlled and mitigated in order to minimise the impacts and effects on the receiving environment. It is predicted that the likely significant effects with mitigation for the cumulative scenario will be as per Table 7.8 above.

7.8.2 Predicted Operational Phase Impacts/Effects

The sustainable features that are incorporated into the design of all residential units will ensure that the operational phase of the development will not have an adverse impact on human health, local air quality or on local or global climate patterns. The residential units will be designed to ensure that they can withstand the potential changes in climate which may generate more extreme and prolonged meteorological events in the future.

It is predicted that fossil fuel combustion gas emissions including Carbon Dioxide, Sulphur Dioxide, Nitrogen Oxides, Carbon Monoxide and hydrocarbon particulate emissions will be negligible as the proposed centralised air source heat pump will provide heat throughout the development and will not have an adverse significant impact on the existing ambient air quality in the vicinity of the proposed development site.

Greenhouse gases occur naturally in the atmosphere (e.g., carbon dioxide, water vapor, methane, nitrous oxide and ozone) and in the correct balance, are responsible for keeping the lower part of the atmosphere warmer than it would otherwise be. These gases permit incoming solar radiation to pass through the Earth's atmosphere but prevent most of the outgoing infrared radiation from escaping from the surface and lower atmosphere into the upper levels. However, human activities are now contributing to an upward trend in the levels of these gases, along with other pollutants with the net result of an increase in temperature near the surface.

Motor vehicles are a major source of atmospheric emissions which contribute to climate change, however, vehicle exhaust emissions generated from vehicles associated with the development will have a negligible impact on the macro-climate given modern technological developments in cleaner and more efficient vehicle engines. The development has been designed to limit the reliance on cars and promote more sustainable transport solutions as evidenced by the reduced car-parking provision and the inclusion of a mobility hub. Current trends suggest that vehicle manufacturers are ceasing the manufacture of large diesel engines for private cars and instead adopting hybrid engine and all electric technologies which will contribute to the reduction of engine exhaust emissions including particulate matter, Nitrogen Oxides, Sulphur Dioxide, Carbon Dioxide and Carbon Monoxide.

The traffic projections for the development up to 2039 predict that the maximum increase at any of the 5 modelled closest junctions to the subject site will increase between 3.9% - 10.5% during the PM Peak and between 1.5% - 5% during the AM peak

The UK DMRB guidance (UK Highways Agency, 2020), on which the *TII Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* is based, states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment:

- Road alignment change of 5 metres or more;
- Daily traffic flow changes by 1,000 AADT or more;
- HDV flows change by 200 vehicles per day or more;
- Daily average speed changes by 10 km/h or more; or
- Peak hour speed changes by 20 km/h or more.

There will be an imperceptible impact on local air quality as a result of increased traffic movements associated with the proposed development as none of the above criteria will be reached or exceeded.

To further reduce the climatic impact of the operational phase of the development, electric vehicle charging points shall be installed in dedicated parking spaces to facilitate residents who own electric vehicles and to encourage other residents to purchase electric vehicles.

The scheme has been designed to provide thermally efficient buildings which will reduce the consumption of fossil fuels within each individual dwelling. This will reduce the impact the operational phase of the development will have on the micro and macro climate. In particular, there will be no "traditional" passive air vents in the apartments which are both thermally and acoustically inefficient. Exhaust Air Heat Pump systems shall be incorporated into the design of all units. These efficient energy reducing systems together with thermally rated window sets will reduce the potential future impacts that the external climate will have in terms of wind and changing temperatures on the internal

environment within the residential units. These design features will ensure the units are thermally efficient thus reducing the use of fossil fuels leading to a reduction of the impact on the micro and macro climate.

The thermal efficiency of the buildings will ensure that the development will be sustainable and will be protected against the impacts of future climate change which may include storm events and prolonged colder periods during the winter season. These factors will contribute to reducing the impact the operational development has on the local and global climate which will ultimately contribute in a positive manner in reducing the impact on local and further afield human health. Table 7.9 below summarises the identified likely significant residual effects of the proposed operational phase of the development.

Table 7.9 – Summary of Operational Phase Likely Significant Effects with Mitigation

Likely Effect	Significant	Quality	Significance	Extent	Probability	Duration	Type
Operational Phase Air Quality	Air	Neutral	Imperceptible	Local	Likely	Long-Term	Residual
Operational Phase Climate	Phase	Neutral	Imperceptible	Local	Likely	Long-Term	Residual

As the National and EU standards for air quality are based on the protection of human health, and concentrations of pollutants for both the construction and operational stages of the proposed development are predicted to be significantly below these standards, the impact to human health is predicted to be negative but overall imperceptible in the short and long term. No significant impacts/effects to either air quality or climate are predicted during the construction or operational phases of the proposed development.

7.9 MONITORING

7.9.1 Construction Phase

This section describes the dust monitoring methodologies that shall be implemented at the site during the construction phases to ensure that dust and particulate matter (PM10 and PM2.5) generated by site activities does not cause nuisance or cause adverse health effects to residential areas and other receptors located in the vicinity of the site boundaries.

7.9.1.1 Dust Deposition Monitoring Methodology

Dust deposition levels will be monitored to assess the impact that site construction site activities may have on the local ambient air quality and to demonstrate that the environmental control measures in place at the site are effective in minimising the impact of construction site activities on the local receiving environment including existing residential developments and lands bordering the site. The following procedure will be implemented at the site on commencement of site activities:

The dust deposition rate will be measured by positioning Bergerhoff Dust Deposit Gauges at strategic locations near the boundaries of the site for a period of 30 +-2 days. Monitoring shall be conducted on a monthly basis during the construction phase. The proposed monitoring locations (D1 – D4) are presented below.

The selection of sampling point locations will be completed after consideration of the requirements of Method VDI 2119 with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures. The optimum locations will be determined by a suitably qualified air quality expert to ensure that the dust gauge locations are positioned in order to best determine potential dust deposition in the vicinity of the site boundaries and existing on-site buildings.

After each (30 +-2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in mg/m²-day in accordance with the relevant standards.

Technical monitoring reports detailing all measurement results, methodologies and assessment of results shall be subsequently prepared and maintained by the Site Manager. Monitoring reports shall be made available to the Local Authority as requested.

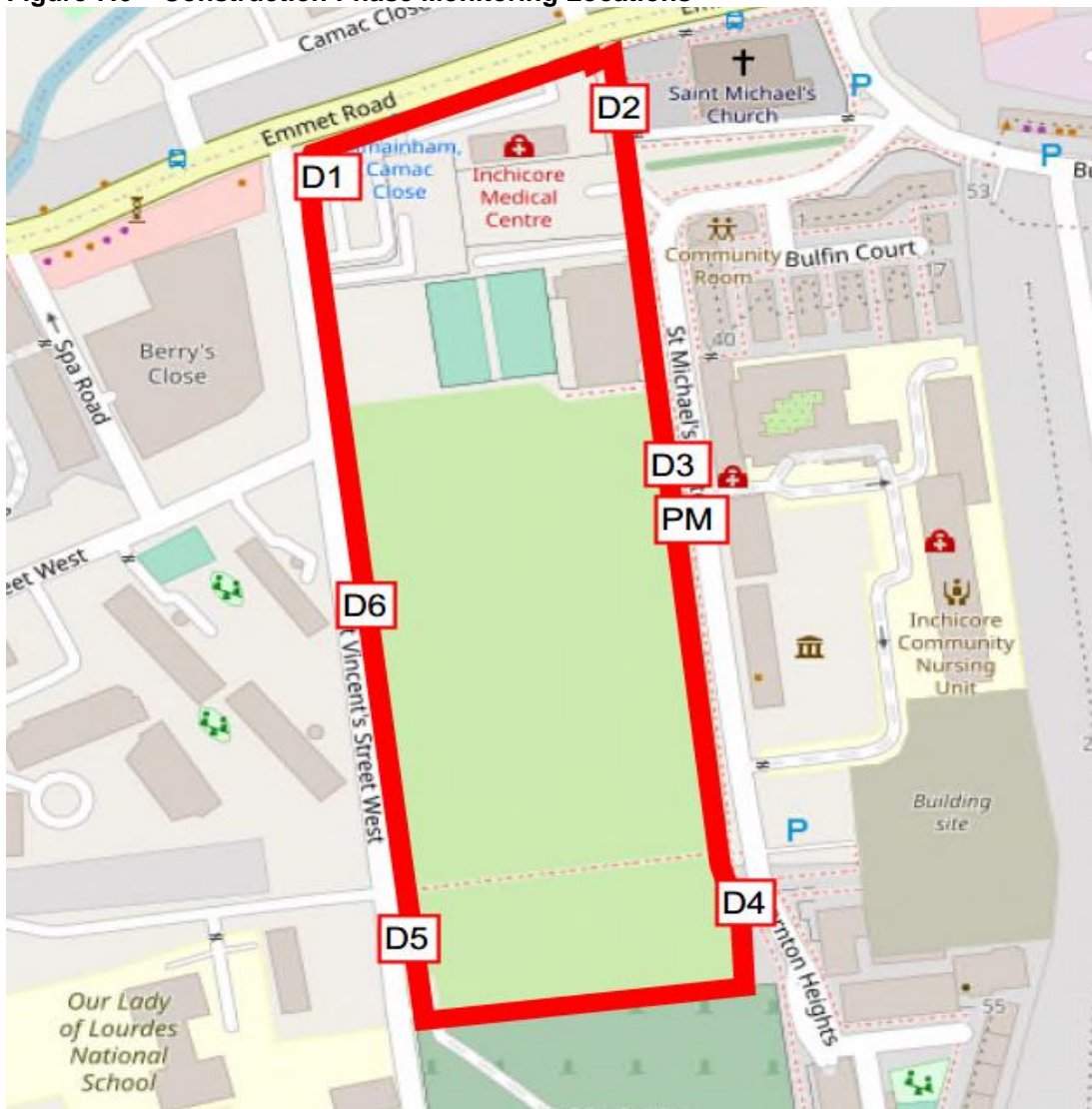
A dust deposition limit value of 350 mg/m²-day (measured as per German Standard Method VDI 2119 – Measurement of Particulate Precipitations – Determination of Dust Precipitation with Collecting Pots Made of Glass (Bergerhoff Method) or Plastic. is commonly specified by Local Authorities and by the EPA to ensure that no nuisance effects will result from specified activities and it is to this Best Practice standard method that this programme of dust monitoring and control has been prepared.

The German Federal Government Technical Instructions on Air Quality Control - TA Luft specifies an emission value for the protection against significant nuisances or significant disadvantages due to dustfall. This limit value is 350 mg/m²-day and it is to this limit value that all measured dust deposition levels shall be assessed. This limit value is commonly specified by Local Authorities at construction sites.

PM10 & PM2.5 Monitoring Methodology

Fine particulate matter as PM10 and PM2.5 shall be monitored using continuous data logging air quality monitoring instrumentation during the stripping and excavation of soils at the site. The monitoring system shall be located at the eastern site boundary at location PM as shown in Figure 7.6 below.

Figure 7.6 – Construction Phase Monitoring Locations



7.9.2 Operational Phase

Air quality monitoring is not required for the operational phase of the proposed development.

7.10 REINSTATEMENT

Reinstatement issues are not relevant to this Chapter of the EIAR, with regard to the construction and operational phases.

7.11 CUMULATIVE IMPACTS/EFFECTS

This section has considered the cumulative impact/effects of the proposed development in conjunction with future and current developments in the vicinity of the subject site.

The cumulative air quality impact of the proposed Emmet Road Mixed use development, on other developments and existing local transport infrastructure is assessed with regard to having established the baseline air quality and then predicting the impact that the proposed development will have on the baseline air quality. Together the combined impact can be assessed to determine if there is sufficient “atmospheric budget” to facilitate the proposed development.

It is considered that, in the absence of mitigation measures, there will be the potential for a short term slight negative cumulative impact associated with the construction phase of the subject development and other local developments on ambient air quality and climate.

Should the construction phase of the proposed Emmet Road development coincide with the construction phase of other local proposed developments including Planning Ref. 2997/21 Emmet Manor, Planning Ref. 3815/20 Our Lady’s School, Goldenbridge Planning Ref. 4260/19 Circle Voluntary Housing Association, St Michaels Estate, Planning Ref. 2453/19 Vabtol Ltd, Emmet Road, Planning Ref. 2747/20 & Reg. Ref. ABP-303435-19, Davitt Road there is the potential for cumulative dust emissions to impact the nearby sensitive receptors if appropriate air quality mitigation and control measures are not implemented.

7.12 DO NOTHING’ IMPACT

The subject site is currently comprised of an undeveloped grassed area and commercial buildings. If the site is not developed will continue to have no adverse impact on existing ambient air quality or on the local micro-climate.

7.12.1 Risk to Human Health

7.12.1.1 Construction Phase

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be negative, short-term and imperceptible with respect to human health.

7.12.1.2 Operational Phase

Operational traffic emissions as a result of the proposed development are compliant with all National and EU ambient air quality limit values which are set for the protection of human health and therefore, will not result in an adverse or harmful impact on human health.

7.13 INTERACTIONS

The interaction between human beings and ambient air quality will vary between the construction and operational phases of the development. The construction phase may cause nuisance to the existing local population including the soiling of properties with dust, however, provided that the construction phase air quality control and mitigation measures are implemented, it is predicted that the impact on humans and air quality will be short-term and minor.

The interaction between human beings and air quality during the operational phase of the development will be minimal with a relatively low quantum of combustion engine vehicles at the proposed development, once fully occupied. Although there will be an increase in traffic movement on the existing road network as a result of the operational phase, the predicted impact will be long-term and imperceptible.

The Appropriate Assessment Screening Report prepared as part of this EIAR concludes that the proposed development will not have any significant impacts/effects on European Sites, therefore the interaction between air quality and the receiving natura environment is predicted to be long-term and imperceptible.

7.14 DIFFICULTIES ENCOUNTERED IN COMPILING INFORMATION

There were no difficulties encountered in compiling this Chapter of the EIAR.

8.0 NOISE AND VIBRATION

8.1 INTRODUCTION

This section of the EIA has been prepared by Byrne Environmental Consulting Ltd to identify and assess the potential noise and vibrational impacts associated with the proposed Emmet Road development during both the Construction and Operational Phases.

This document includes a comprehensive description of the receiving ambient noise climate in the vicinity of the subject site; a description of how the construction and operational phases may impact the existing ambient noise climate, the mitigation measures that shall be implemented to control and minimise the impact that the development may have on ambient noise levels and the proposed acoustic design features required to minimise the impact of external noise sources on the residential units.

Ian Byrne MSc. Environmental Protection, Dip Environmental & Planning Law, Member of the Institute of Acoustics, is the Principal Environmental Consultant of Byrne Environmental Consulting Ltd and prepared all aspects of this EIA Chapter. Ian Byrne has over 25 years experience in the monitoring and assessment of noise and vibration impacts that the construction and operation of residential, commercial and industrial developments may have on the receiving environment. In particular we have significant experience in preparing the noise and vibration impact assessment Chapters of EIA's for SHD's and LRD's.

Based on academic qualifications and professional experience, Ian Byrne is defined as a "Competent Person" as defined in the EPA's 2016 Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).

8.2 STUDY METHODOLOGY

8.2.1 Legislation and References

The general assessment methodology of the potential noise and vibrational impacts that the proposed development will have on the receiving environment has been prepared in accordance with and with reference to:

- European Union (Planning & Development) (Environmental Impact Assessment) Regulations 2018;
- Planning and Development Act 2000 (as amended);
- Planning and Development Regulations 2001 (as amended);
- Directive 2011/92/EU;
- Directive 2014/52/EU;
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licensing Systems – Key Issues Consultation Paper (2017; DoHPCLG);
- Preparation of guidance documents for the implementation of EIA directive (Directive 2011/92/EU as amended by 2014/52/EU) – Annex I to the Final Report (COWI, Milieu; April 2017);
- Guidelines on the information to be contained in environmental impact assessment reports, EPA, 2022
- Environmental Impact Assessment – Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018; DoHPLG); and
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU) European Commission (2017)

8.2.2 Baseline Assessment Methodology

The existing ambient noise climate in the vicinity of the site has been characterised with information obtained from site specific baseline noise surveys conducted in the vicinity of the closest noise sensitive receptors to the subject site. Baseline noise surveys were conducted in accordance with ISO 1996-1: 2017: Acoustics – Description, measurement and assessment of environmental noise and with regard to the EPA's 2016 Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).

The EPA's Round 3 Strategic Road Noise Mapping of was reviewed to establish the specific impact that transportation related noise sources have on the Emmet Road site.

8.2.3 Impact Assessment Methodology

The impact/effects of the proposed development has been determined through prediction of future noise levels associated with the scheme using established calculation techniques.

Construction noise and vibration impacts/effects have been assessed in accordance with Transport Infrastructure Ireland's (TII) guidance document Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes (March 2014). Indicative construction noise calculations have been undertaken using the methodology set out in BS 5228 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise 2009+A1 2014.

Impacts associated with road traffic movements on the development when operational have been assessed with regard to the NRA's Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes (March 2014) and the UK Department of Transport (Welsh Office) - Calculation of Road Traffic Noise [CRTN] and the Highways Agency Design Manual for Roads and Bridges Part 7 HD 213/11 – Revision 1 Noise and Vibration.

The operational phase of the development has been assessed with regard to the Department of the Environment, Building Regulations 2014, Technical Guidance Document E – Sound. Acoustic design of apartments refers to the 2018 Ministerial Guidelines "Sustainable Urban Housing – Design Standards for New Apartments. Paragraph 1.18 of the document refers specifically to the Building Regulations Technical Guidance Documents and states that the construction of the apartment building shall comply with all relevant requirements.

8.2.4 Construction Noise Impact Assessment Criteria

The construction noise limits which are presented in Table 8.1 are specified in British Standard BS 5228 – 1:2009+A1 2014 Code of practice for noise and vibration control on open sites: Part 1 Noise and are based on the noise measured at the external façade of a receptor.

BS5228 states that noise sensitive receptors (houses) are designated a category based on existing ambient noise levels. Each category is then assigned with a noise limit value.

Category A Threshold values when ambient noise levels are less than these values

Category B Threshold values when ambient noise levels are the same as the Category A values

Category C Threshold values when ambient noise levels are higher than the Category A values

Table 8.1 – Threshold of Potential Significant Effect at Dwelling

Category and Threshold Value Period LAeq dB(A)	Category A	Category B	Category C
Night 23:00 – 07:00	45	50	55
Evening 19:00 - 23:00 & Weekends	55	60	65
Day 07:00 – 19:00 & Sat 07:00 – 13:00	65	70	75

8.2.5 Construction Vibration Impact Assessment Criteria

Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. In both instances, it is appropriate to consider the magnitude of vibration in terms of Peak Particle Velocity (PPV).

Construction related vibrational impacts have been assessed in accordance with BS 7385-2:1993 – Evaluation and Measurement for Vibration in Buildings: Part 2 – Guide to Damage Levels from Groundborne Vibration and BS 5228 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration 2009+A1 2014.

Operational impacts/effects have been assessed in accordance with the Transport Infrastructure Ireland, TII Guidelines for the Treatment of Noise & Vibration in National Road Schemes, 2014.

Table 8.2 details the limits above which cosmetic damage could occur for transient vibration. Minor damage is possible at vibration magnitudes which are greater than twice those shown in Table 8.4, and major damage to a building structure would only generally occur at values greater than four times the tabulated values. These values only relate to transient vibration. If there is a continuous vibration, the guide values shown in Table 8.4 shall be reduced by up to 50%.

This guidance is reproduced from BS 5228-2:2009+A1 2014 – Code of Practice for Noise and Vibration Control on Construction and Open Sites: Part 2 – Vibration and BS 7385-2:1993 – Evaluation and Measurement for Vibration in Buildings: Part 2 – Guide to Damage Levels from Groundborne Vibration.

Table 8.2 – Transient vibration guide values for cosmetic damage

Type of building	PPV (mm/s) in frequency range of predominant pulse	
	4-15Hz	15Hz and above
Reinforced or framed structures. Industrial and heavy commercial buildings.	50mm/s at 4Hz and above.	50mm/s at 4Hz and above.
Unreinforced or light framed structures. Residential or light commercial buildings.	15mm/s at 4Hz increasing to 20mm/s at 15Hz.	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above.

Table 8.3 reproduced from BS 5228 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration 2009+A1 2014 outlines the vibration levels (in terms of PPV) from construction activities and their likely effect on humans.

Table 8.3 – Guidance on the effect of construction vibration levels on humans

Vibration Level (PPV)	Effect
0.14mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.30mm/s	Vibration might be just perceptible in residential environments.
1.0mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

There are several protected structures including Barracks wall – a protected structure located in the north of the subject site, and Richmond Barracks and St. Michael’s church opposite areas of major construction. Therefore, on a precautionary basis, the guidance values for structurally sound buildings are reduced by 50% in line with the guidance documents referred to above. The following vibration limits are to be adhered to in order to prevent damage to all structures in proximity to works and is included Construction Environmental Management Plan for the proposed development (see Volume III of the EIAR).

Table 8.4 – Recommended Vibration Criteria During Construction Phase

Building Category	Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:		
	Less than 15Hz	15 to 40Hz	40Hz and above
Structurally sound and non-protected buildings	12 mm/s	20 mm/s	50 mm/s
Protected and /or potentially vulnerable buildings	6 mm/s	10 mm/s	25 mm/s

8.2.6 Operational Noise Impact Assessment Criteria

The noise impact assessment criteria associated with road traffic noise is set out in Table 8.4 below.

Building Services Noise

The noise associated with the commercial aspect and non-domestic aspects of the development relate to building services noise from fans, chillers and HVAC systems. In order to ensure that existing and future noise sensitive receptors are not adversely impacted by the operation of mechanical plant the noise levels at the closest noise

sensitive receptors shall not exceed the limit values as detailed in Table 8.4. These limits are referenced from the EPA's NG4 Noise Guidance document.

Table 8.4 – Operational Noise Building Services

Period	Limit
Daytime 7am – 7pm	55dB(A) Lar,T
Evening 7pm – 11pm	50dB(A) Lar,T
Night 11pm – 7am	45dB(A) Lar,T

Road Traffic Noise

Table 8.5 – Likely impact associated with change in traffic noise level

Change in sound level (L ₁₀)	Subjective reaction	Impact
<3	Inaudible	Imperceptible
3-5	Perceptible	Slight
6-10	Up to a doubling of loudness	Moderate
11-15	Over a doubling of loudness	Significant
>15		Profound

A change in traffic noise of less than 2dBA is generally not noticeable to the human ear whilst a change of 3dBA is generally considered to be just perceptible. Changes in noise levels of 3 to 5 dBA would however be noticeable and, depending on the final noise level, there may be a slight or moderate noise impact. Changes in noise level in excess of 6dBA would be clearly noticeable, and depending on the final noise level, the impact may be moderate or significant. However, a significant change in traffic volumes or traffic category i.e., increase in the use of a road by HGVs, would be required to result in such increases.

The UK Design Manual for Roads and Bridges (DMRB, Volume 11, Section 3, Part 7) states that a change in noise level of 1dB LA_{10,18h} 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 LA_{10,18h} is equivalent to a 100% increase or a 50% decrease in traffic flow.

Traffic noise levels in excess of 60dBA (Lden) are considered to be potentially intrusive. LDEN is the day-evening-night composite noise indicator for assessing overall noise annoyance. For new roads projects the National Roads Authority design goal is to mitigate when predicted levels exceed 60dB Lden. However, for existing roads the Dublin Agglomeration, within the Noise Action Plan, have set a level of 70dB (Lday) and 55dB (Lnight) above which mitigation measures should be considered.

The World Health Organisation (WHO) in their 2018 publication entitled Environmental Noise Guidelines for the European Region has proposed new guidelines for community noise. In this guidance, a Lden threshold daytime noise limit of 53dB is suggested to protect against adverse health effects. Lnight Levels of 45dB or less are proposed at night-time to protect against adverse effects on sleep.

The operational phase of the development shall be assessed with regard to the 2018 WHO guidelines and appropriate acoustic design of residential units to ensure that they comply with the Department of the Environment, Building Regulations 2014, Technical Guidance Document E – Sound.

IOA/ANC ProPG:Planning & Noise-New Residential Development, May 2017 Professional Practice Guidance (ProPG) is considered in the assessment of the operational phase of the residential development in terms of ensuring that each residential unit in the Emmet Road development will not be adversely impacted by external related noise sources and are within the Low Risk categories for the daytime and nighttime periods.

8.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

8.3.1 Description of the baseline environment - Environmental Noise Context

The subject development site is located in an area which includes, healthcare, educational and residential development. It is situated between Emmet Road to the north of the site, Goldenbridge Cemetery to the south, St. Vincent's Street West and a local access road to the east serving Thornton Heights apartments, and a HSE facility. The existing ambient noise climate was observed to be relatively quiet for an urban environment during the daytime

and nighttime periods as the site is setback from Emmet Road to the north and Davitt Road and the Red LUAS line further south of the site.

8.3.2 Baseline noise & vibration monitoring locations

Baseline noise measurement surveys were conducted at site boundaries, N1 & N4 as described in Table 8.5 and as shown in Figure 8.1 between 18th – 19th December 2020 and 1st – 3rd March 2021 during suitably dry and calm (<5mm/sec) wind conditions. Baseline monitoring was conducted over two separate monitoring periods to evaluate the busier Christmas time period and a period during normal weekday period to establish how existing ambient noise levels may vary. Baseline noise measurements were also conducted to determine the presence of any local ambient noise sources which may be intermittently present. The on-site baseline surveys demonstrate consistency with the long-term noise data published by the EPA Round 3 transportation noise modelling and thus verify the representativeness of the on-site baseline noise surveys.

Baseline surveys were conducted under free-field conditions at a height of approximately 3m above ground and approximately away from reflecting surfaces for a period of 3-hours during the daytime period and for 1-hour periods during the nighttime period at each on-site location in order to obtain detailed noise data and assess the existing noise climate at the locations accurately.

Table 8.5 – Baseline noise measurement locations

Location	Description
N1	Opposite houses on St Vincent’s Street West
N2	Opposite St Michael’s Church
N3	HSE facility /Hollybrook Lodge residential units
N4	Opposite flat complex on St Vincent’s Street West
N5	Thornton Heights Apartments southeast of site
N6	National School southwest of site

Figure 8.1 – Baseline Noise & Vibration Monitoring Locations



It is noted that vibration surveys were also conducted during the baseline noise survey locations N1 – N6. It was established that there are no existing inherent sources of vibration at the development site and that recorded levels at N10N6 were <0.125mm/sec PPV.

The noise parameters used to describe the existing ambient noise climate are described as follows:

LAeq: The equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

LA10: The sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.

LA90: The sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

LAmx: The instantaneous maximum sound level measured during the sample period.

1/3 Octave band analysis The frequency analysis of a sound such that the frequency spectrum is subdivided into bands of one-third of an octave each. Used to determine tonal components of a sound source.

Noise levels are measured using a logarithmic noise scale (decibel) and are denoted dBA. The "A" indicates that a frequency weighting has been applied to allow for the variation in the sensitivity of the human ear.

8.3.3 Baseline Noise & Vibration Monitoring Results

Table 8.6 – Location N1 Northeastern site boundary opposite houses along St. Vincent's Rd West

Period 18.12.20 N1	Measured sound pressure levels dBA (re 20µPa)			
	LAeq,	LA10	LA90	LAMax
Daytime period 10:20 – 13:20hrs 3-hr period	58	59	53	76
Nighttime period 00:25 – 01:25hrs 1-hr period	54	56	48	73
11.05.22 Daytime period 11:15 – 12:15	57	59	55	77

The noise climate at N1 is influenced by traffic on Emmet Road and local traffic movements on St. Vincent's Street West. No tonal or impulsive noise sources were observed.

Recorded vibration levels were negligible <0.125mm/sec PPV during the survey period at Location N1.

Table 8.7 – Location N2 Northeastern site boundary opposite St Michael's church

Period 19.12.20 N2	Measured sound pressure levels dBA (re 20µPa)			
	LAeq,	LA10	LA90	LAMax
Daytime period 13:40 – 16:40hrs 3-hr period	60	62	57	79
Nighttime period 23:10 – 00:10hrs 1-hr period	57	60	55	77
11.05.22 Daytime period 13:10 – 14:10 hrs	61	63	57	83

The noise climate at N2 is influenced by traffic on Emmet Road and local traffic movements on St. Michael's estate road. No tonal or impulsive noise sources were observed.

Recorded vibration levels were negligible <0.125mm/sec PPV during the survey period at Location N2.

Table 8.8 – Location N3 Eastern site boundary opposite HSE facility / Hollybrook Lodge Residential Units

Period 01.03.21 N3	Measured sound pressure levels dBA (re 20µPa)			
	LAeq,	LA10	LA90	LAMax
Daytime period 09:05 – 12:05hrs 3-hr period	55	57	52	69
Nighttime period 23:10 – 00:10hrs 1-hr period	50	53	47	70

10.05.22 Daytime period 10:23 – 11:23hrs	54	56	51	65
--	----	----	----	----

The noise climate at N3 is influenced by local traffic movements on St. Michael's estate road/Patriots Path. No tonal or impulsive noise sources were observed.

Recorded vibration levels were negligible <0.125mm/sec PPV during the survey period at Location N3.

Table 8.9 – Location N4 Western site boundary opposite flat complex

Period 01.03.21 N4	Measured sound pressure levels dBA (re 20µPa)			
	L _{Aeq}	L _{A10}	L _{A90}	L _{AMax}
Daytime period 13:40 – 16:40hrs 3-hr period	56	58	55	72
Nighttime period 23:30 – 00:30hrs 1-hr period	52	53	49	68
10.05.22 Daytime period 15:15 – 14:15hrs	55	60	49	69

The noise climate at N4 is influenced by local traffic movements on St. Vincents Street West. No tonal or impulsive noise sources were observed.

Recorded vibration levels were negligible <0.125mm/sec PPV during the survey period at Location N4.

Table 8.10 – Location N5 Southeastern site boundary adjacent Thornton Heights houses

Period 02.03.21 N4	Measured sound pressure levels dBA (re 20µPa)			
	L _{Aeq}	L _{A10}	L _{A90}	L _{AMax}
Daytime period 13:15 – 16:15hrsrs 3-hr period	57	58	55	70
Nighttime period 23:30 – 00:30hrs 1-hr period	54	57	52	71
10.05.22 Daytime period 16:00 – 17:00hrs	58	60	53	75

The noise climate at N4 is influenced by local traffic movements on St. Michael's estate road. LUAS movements are faintly audible from the Red Line located further south adjacent Davitt Road. No tonal or impulsive noise sources were observed. No tonal or impulsive noise sources were observed.

Recorded vibration levels were negligible <0.125mm/sec PPV during the survey period at Location N4

Table 8.11 – Location N6 Southwestern site boundary adjacent Our Lady of Lourdes School

Period 03.03.21 N4	Measured sound pressure levels dBA (re 20µPa)			
	L _{Aeq}	L _{A10}	L _{A90}	L _{AMax}
Daytime period 09:50 – 12:50hrs 3-hr period	55	59	52	73
Nighttime period 23:05 – 00:05hrs 1-hr period	53	55	51	67
11.05.22 Daytime period 09:00 – 10:00hrs	56	60	54	71

The noise climate at N5 is influenced by local traffic movements on St. Vincents Street West. Passing LUAS movements are faintly audible from the Red Line located further south adjacent Davitt Road. No tonal or impulsive noise sources were observed.

Recorded vibration levels were negligible <0.125mm/sec PPV during the survey period at Location N4

Additional baseline noise surveys were conducted on 10th & 11th May 2022 to verify the validity of the 2021 survey results.

Noise surveys were conducted for 1-hour periods at each location (N1-N4) during the daytime and nighttime periods and the May 2022 results were consistent with the March 2021 results.

8.3.4 Dublin Agglomeration Environmental Noise Plan 2018 - 2023 & EPA Round 3 Road Noise Mapping Assessment

In order to further establish existing background noise levels associated with the identified dominant noise source identified as being road traffic, the EPA’s noise mapping data was reviewed to assess Lden and Lnight road traffic and rail (LUAS) noise indicators.

The EPA’s Round 3 Transport Noise Maps has been reviewed as part of this assessment.

Figures 8.2 – 8.5 present the daytime Lden and nighttime Lnight Noise Maps for road traffic and LUAS Redline movements relative to the location of the subject Emmet Road development site.

The Lden parameter is a descriptor of noise level based on energy equivalent noise level (Leq) over a whole day with a penalty of 10dB(A) for nighttime noise (23:00 – 07:00hrs) and an additional penalty of 5dB(A) for evening noise (19:00 – 23:00hrs).

The Lnight parameter is a descriptor of noise level based on energy equivalent noise level (Leq) over an 8-hour night period between (23:00 – 07:00hrs).

Desirable and undesirable sound levels are defined as follows:

Desirable Levels 24-hour Day-Evening-Night Noise Value	<70dB(A) Lden
Desirable Nighttime Noise Value	<55 dB(A) Lnight

The Road and LUAS Noise Mapping assessment concludes that the Emmet Road development site is not adversely impacted by road traffic or LUAS noise during the daytime or nighttime periods and verifies the accuracy of the on-site attended baseline noise surveys conducted.

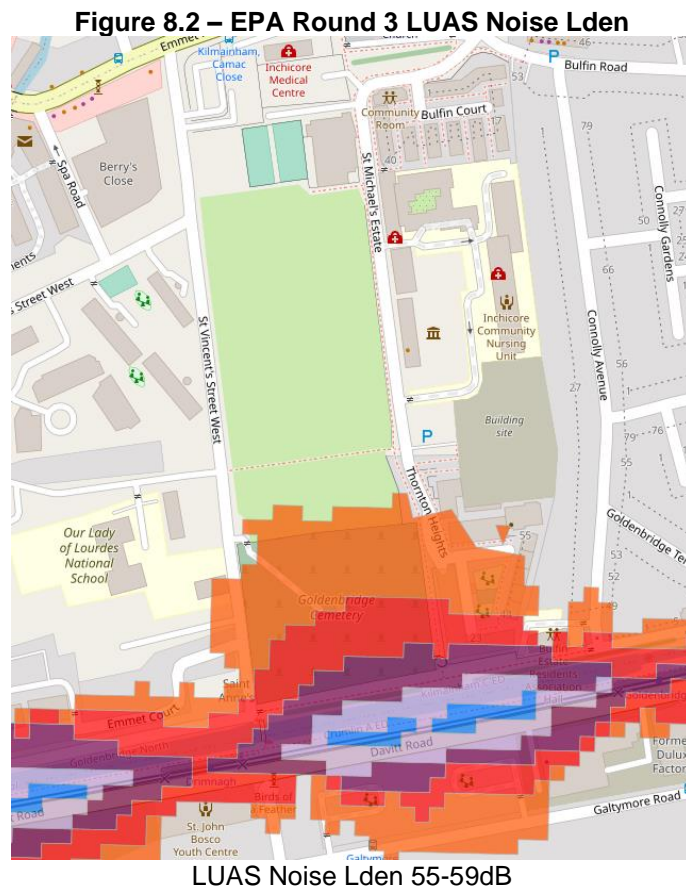
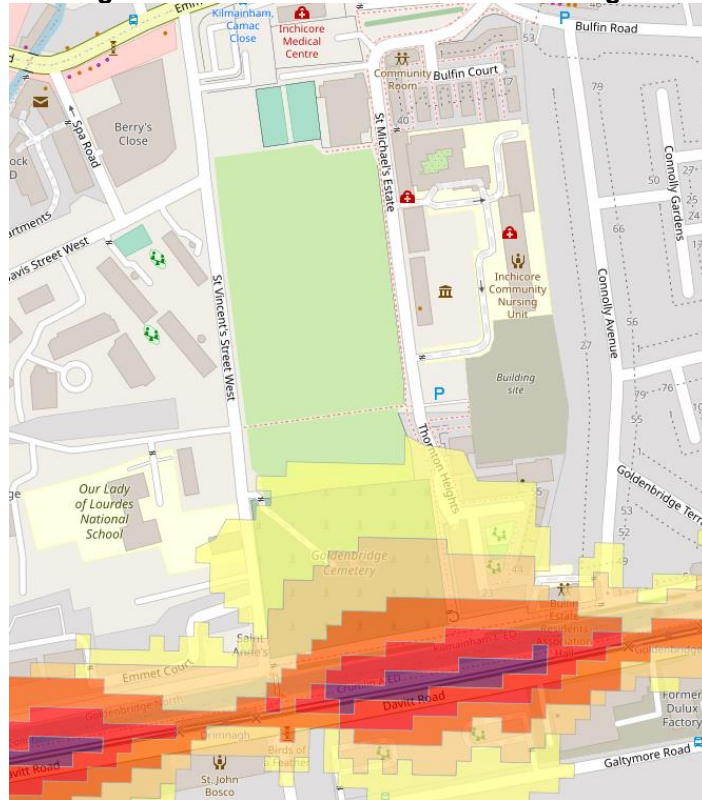


Figure 8.3 – EPA Round 3 LUAS Noise Lnight



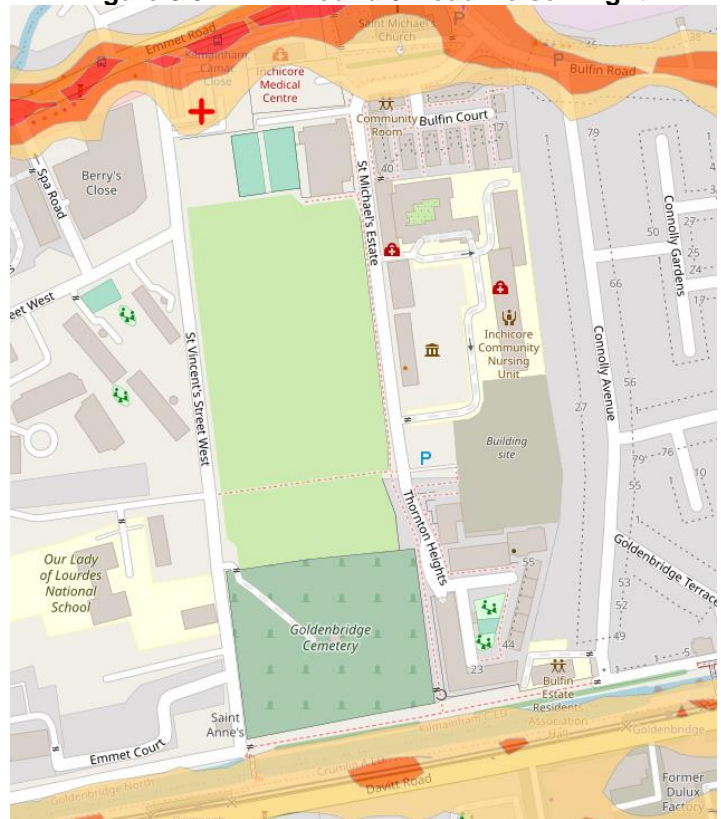
LUAS Noise Lnight 45-49dB

Figure 8.4 – EPA Round 3 Road Noise Lden



Road Noise Lden 55-59dB

Figure 8.5 – EPA Round 3 Road Noise Lnight



Road Noise Lnight <50dB

8.3.4 Significance

It may be concluded that the impact of road traffic or LUAS noise on the proposed development is below the Lden and Lnight unacceptable noise limit criteria specified in the Dublin Agglomeration Environmental Noise Plan 2018 - 2023 and that the proposed development will not be subject to unacceptable or adverse road traffic noise.

With regard to the ProPG risk assessment conducted based on the baseline noise assessment, the development site may be classified as having a low risk in terms of the existing low-noise climate at the site, that is, there are no adverse pre-existing noise sources in proximity to the development site which may impact the residential units once developed and occupied by residents.

8.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The development will comprise 578 no. apartments supplemented and supported by community facilities (community hub/library, creche, retail/café units), a plaza in a mixed-use scheme which includes a supermarket fronting onto Emmet Road. In addition water mains upgrades are proposed along Emmet Road. A full description of the proposed development is described in Chapter 2 of this EIAR.

When considering a mixed-use development of this nature, the potential impacts of noise on the receiving environment must be considered for each distinct stage: the short-term impact of the construction phase and the ongoing long-term impact of the operational phase.

Short term noise exposure during the construction phase must be managed and controlled to acceptable levels. There are a number of existing noise sensitive receptors located in proximity to the development site's boundaries including existing residential, educational, health care and religious. It is fundamental that the proposed development or any aspect of the proposed development must not adversely impact the existing noise levels experienced at these receptors over the short-term construction phase or the long-term operational phase.

The short-term construction phase will increase ambient noise levels and have the potential generate ground vibrations as a result of plant and machinery operating and the movements of trucks to and from the site.

It is noted that there is a protected structure comprising the remnants of the Richmond Barracks wall located in the north-western corner of the subject site. Other protected structures in the vicinity comprise Richmond Barracks located to the east and St. Michael's Church. The proposed development will entail some works to the protected wall.

The long-term operational phase will not result in significant outward noise or vibration impacts. The principal source of outward noise will be associated with increased traffic movements along St. Vincent's Road West.

With regard to the relatively quiet existing ambient noise climate at the site, there will be a negligible inward noise impact on the operational development from existing noise sources identified to be road traffic.

The existing ambient noise climate shall be maintained during the operational phase of the development.

8.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

Various elements of both the construction and operational phases of the proposed development have the potential to impact on the receiving on the local receiving noise environment, on adjacent residential properties and on human health. The likely potential impacts for both construction and operation of the proposed scheme prior to mitigation are described in this chapter of the EIAR. The mitigation measures are described in Section 8.7 and the predicted impacts with the development in place and the mitigation measures incorporated in Section 8.9.

8.5.1 Potential Construction Noise Impacts

The development of the site will be conducted in the following phased stages:

- Demolition of structures and hard surfaces of the former Heath Centre and St. Michael's Community Centre (To be conducted by DCC under a separate Part 8 planning application)
- Enabling works - Site set up and site clearance (soils and rock removal to foundation level)
- Construction works including infrastructure and building construction and landscaping

8.5.1.1 Enabling works - Site Set Up

Works activities associated with the 'Site set up' will be undertaken prior to construction works commencing. The setting up of the site shall involve the construction of site security hoarding and site compounds, site offices, materials and waste storage areas and staff welfare facilities. These short-term activities will have a minimal potential to generate excessive noise levels.

8.5.1.2 Enabling works - Site Clearance

The proposed development involves the ground clearance of the existing site to facilitate the proposed development including soils and rock to foundation level.

A variety of items of plant will be in use during site clearance and ground excavation. These will include excavators, dump trucks, compressors and generators, pneumatic breakers and tipper trucks to remove the materials off-site. The operation of these items of plant have the potential to generate short term elevated noise levels beyond the site boundary.

During the site clearance works the movement of trucks to and from the site shall result in an increase in the volume of HGV's within the immediate area and along the proposed haul routes which will generate additional noise levels.

8.5.1.3 General Construction Works

During the construction phase there will be extensive site works, involving construction machinery, construction activities on site, and construction traffic, which will all generate noise. The construction noise levels will be of relatively short-term duration and will only occur during daytime hours.

The construction phases shall result in a short-term moderate increase in noise levels in the area as well as introducing tonal and impulsive noise as a result of construction activities such as pneumatic breaking, cutting, excavating, vehicle movements and general manual construction activities.

The proposed construction phase noise mitigation measures as detailed in Section 8.7 shall ensure that all construction activities are controlled and managed and monitored to minimise the potential impacts on local noise sensitive receptors located adjacent to the eastern and western site boundaries.

8.5.1.4 Potential Vibration Impacts

Potential for vibration impacts during the construction phase programme are associated with the ground breaking and excavations required. The most significant potential sources of ground borne vibrations that may be generated during the construction phase of the development will be generated by the following practices:

- Movement of site vehicles bulldozers, tracked excavators and dump trucks on ground surfaces
- Hard core surfaces and haul road compaction with vibro-rolling vehicles
- Road construction surface vibro-rolling

Vibration impacts have been considered from any particular plant items that have the potential to generate perceptible levels of vibration.

Depending on the methods of construction, there is the possibility of construction related vibration impacts on human beings as a result of ground preparation and concrete foundation excavation activities. However, such sources of vibration shall be temporary and intermittent.

It is predicted that vibration levels associated with construction activities at the closest receptors to the site will not exceed 1.0mm/sec PPV and will have imperceptible, short-term impact on the structures of the buildings.

Human response to ground borne vibrations will be perceptible at levels between 0.14 to 1.0 mm/sec PPV. Potential construction vibrational impacts will be short-term, negative and slight.

Recommended maximum vibration limits for protected structures (including the wall) are set out in Table 8.4 however, where works producing high levels of vibration in close proximity to protected structures are required, this should be carried out in consultation with the relevant engineer/conservation expert.

8.5.2 Potential Operational Phase Effects

The potential noise aspects to be considered for the completed operational development will include additional traffic noise associated with the development, the operation of mechanical plant and the operation of the retail/cafe units, community hub/library and the creche.

8.5.3 'Do Nothing' Scenario

If the subject site remains undeveloped, the noise impact will be neutral long-term and insignificant.

8.6 CUMULATIVE NOISE IMPACTS

In accordance with Schedule 6, Part 2(c) of the Planning and Development Regulations 2001-2018, this section has considered the cumulative impact of the proposed development in conjunction with existing adjacent development and future development in the vicinity of the subject site. This section relates to the cumulative noise impact on the subject site itself on existing noise sensitive receptors.

Under Planning Reg. Ref. 4260/19, permission was granted permission for development comprising a 52 unit older persons residential development.

During the construction phase of the proposed development, construction noise on site will be localised and will therefore likely be the primary noise source at the nearest noise sensitive receivers.

Should the construction phase of the proposed Emmet Road development coincide with the construction phase of other local proposed developments including Planning Ref. 2997/21 Emmet Manor, Planning Ref. 3815/20 Our Lady's School, Goldenbridge Planning Ref. 4260/19 Circle Voluntary Housing Association, St Michaels Estate, Planning Ref. 2453/19 Vabtoll Ltd, Emmet Road, Planning Ref. 2747/20 Durkan, Davitt Road there is the potential for cumulative noise emissions to impact the nearby sensitive receptors if appropriate mitigation and control measures are not implemented.

In the context of the operational phase, permitted developments are included in the traffic impact assessment and therefore the potential for a cumulative impact has been assessed.

Any large-scale future projects that are not yet proposed or permitted would also need to be the subject of EIA in turn, to ensure that no significant impacts resulting from noise and vibration will occur as a result of those developments.

It is predicted that there will be short-term moderate negative impact in terms of noise associated with the DCC demolition works and 52 unit older persons residential development. Should all developments occur simultaneously or overlap, there will be an increased negative, short-term noise impact at local noise sensitive receptors.

8.7 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

8.7.1 General Construction Site Management

The following noise management measures shall be implemented at the site from the outset of site activities to control and manage noise levels during the construction phase of the proposed development:

NV CONST 1 Construction Management Noise Mitigation

An independent acoustic consultant will be engaged by the contractor prior to the commencement of site activities to ensure that all noise mitigation measures as specified in this Chapter of the EIAR are implemented and to prepare a site-specific Construction Phase Noise Management Plan. The Plan will include all relevant noise and vibration control measures as specified in this Chapter of the EIAR. The Plan will be submitted to Dublin City Council for approval prior to the commencement of site works.

The nominated contractor shall appoint a designated person to manage all environmental complaints including noise and vibration.

A noise complaint procedure shall be implemented in which the details of any noise related complaint are logged, investigated and where required; measures are taken to ameliorate the source of the noise complaint.

In the event of the requirement for out of hours work to occur which will involve the generation of noise levels that are predicted to exceed out of hours noise limit criteria, Dublin City Council shall be notified no less than 72-hours prior to the works commencing.

Appropriate signage shall be erected on all access roads in the vicinity of the site to inform HGV drivers that engines shall not be left idling for prolonged periods and that the use of horns shall be banned at all times.

All site staff and contractors will be made aware of the requirement to implement noise mitigation measures to reduce the impact of all construction activities on the adjacent noise sensitive receptors by tool-box talks and via signage that shall be posted throughout the site.

Should noise limits be exceeded, site management will immediately investigate the source of the activity generating the noise and ensure that it is controlled to prevent a repeat exceedance.

Site offices will be stacked to act as a noise barrier to minimise the propagation of site noise.

The high site hoarding with a minimum height of 4m shall be erected around the entire site boundary to reduce the propagation of noise from the site to adjacent noise sensitive receptors.

Mains power will be used to supply electricity to all site offices and site lighting.

8.7.2 Construction Phase Noise Control & Mitigation

The following will be implemented to mitigate construction noise impacts in order to ensure that the construction phase of the development does not have an unacceptable impact on local noise sensitive receptors:

NV CONST 2 Construction Works Noise Mitigation Measures

- A strictly enforced noise management plan will be implemented at the site from the outset of construction activities and will include the mitigation measures contained in this EIA.
- The principle of controlling noise at source will be implemented at the site. Best practice mitigation techniques as specified in BS 5228:2009+A1 2014 – Noise and Vibration Control on Construction and Open Sites will be implemented during the construction phase and are detailed in this Section.
- Generators will not operate when the site is closed during the nighttime and during weekends.
- Mains power and transformers will be used instead of generators where possible
- Where generators are required, only super silenced models shall be used.
- Mobile compressors shall be enclosed by acoustic screens.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and will be maintained in good efficient order
- All high noise activities including but not limited to, concrete cutting, steel cutting, pneumatic breaking shall be conducted using acoustic screens to minimise the propagation of noise and minimise the reverberation of the noise from the activity.
- All site vehicles shall be fitted with broadband non-tonal reverse alarms
- All pneumatic percussive tools such as pneumatic hammers shall be fitted with dampers, mufflers or silencers of the type recommended by the manufacturer.
- Any plant, equipment or items fitted with noise control equipment found to be defective in shall not be operated until repaired / replaced.
- Site vehicles and items of plant in intermittent use shall be shut down in the intervening periods between works or throttled down to a minimum during periods when not in use.
- All excavator mounted pneumatic breakers used for demolition and ground breaking activities shall be fitted with effective dampeners and /or enclosed within a noise adsorbing blanket structure to minimise the propagation of noise
- All drivers of excavators and material movement vehicles shall be instructed to minimise drop heights at all times. Signage to this effect shall be posted throughout the site.
- The dragging of materials such as steel covers, plant or excavated materials along ground surfaces shall not be permitted.

The images below describe the use of typical localised acoustic screens that shall be used during construction activities.

Double height acoustic blanket enclosure



Acoustic blankets screening excavations



3 sided Acoustic enclosure



Acoustic Blankets



8.7.3 Construction Phase Vibration Control & Mitigation

The following specific vibration mitigation and control measures shall be implemented during the construction phase:

NV CONST 3 Vibration Mitigation Measures

- Choosing alternative, lower-impact equipment or methods wherever possible
- Routing, operating or locating high vibration sources as far away from sensitive areas as possible
- Sequencing operations so that vibration causing activities do not occur simultaneously
- Isolating the equipment causing the vibration on resilient mounts
- Keeping equipment well maintained.
- Confining vibration-generating operations to the least vibration-sensitive part of the day which could be when the background disturbance is highest

- A nominated person from the Project Management team will be appointed to liaise with local residents and businesses regarding vibrational nuisance events.
- In order to ensure that site construction activities are conducted to minimise the vibration impacts on the receiving environment, structural vibration monitoring shall be conducted during the course of the construction phase,

N V CONST 4

In order to protect the amenities enjoyed by nearby residents and premises a full Construction and Environmental Management Plan (CEMP) (including traffic management) shall be included in the application documentation. The CEMP will include the mitigation measures set out in this section of the EIA.

8.7.4 'Worst-case' scenario

In relation to the potential noise and vibration impacts associated with the construction phase, a worst case scenario would occur as a result of the generation of uncontrolled or unmitigated noise and vibration if the mitigation measures described above are not implemented. This would result in excessive noise emissions from the site which may cause nuisance and disturbance to local receptors.

8.7.5 Operational Phase Noise Mitigation

8.7.5.1 Outward Noise Impact Mitigation Measures

The development will include residential units, retail units, resident amenity spaces, an energy centre and a creche. The operation of these aspects of the development will require them to be designed to ensure that they are acoustically insulated and their operation will not generate noise that will have a negative impact on existing noise sensitive receptors or on residential units within the development itself.

NV O1 All retail units shall be acoustically isolated from other aspects of the building and residential units.

NV O2 All retail units that require mechanical ventilation or kitchen extraction systems shall be acoustically designed to ensure that mechanical noise does not impact residential units or external noise sensitive receptors.

NV-O3 The operational noise of any retail unit will not exceed 45dB(A) when measured at a reference distance of 10m from the facade of the building.

NV-O4 The energy centre shall be acoustically insulated and all plant and equipment shall be mounted on anti-vibration footings to prevent vibrational noise being generated. The internal walls and ceiling of the building will be fitted with sound adsorbing materials to minimise the reverberation of sound within the building generated by the operation of mechanical plant.

NV-O5 The operational noise of plant noise associated with supplying heat to the development will not exceed 45dB(A) when measured at a reference distance of 10m from all facades of the building and at roof level.

NV-O6 All residential units shall comply with the sound insulation requirements of Department of the Environment, Building Regulations 2014, Technical Guidance Document E – Sound.

8.8 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

8.8.1 Construction phase

The predicted construction noise levels that will be experienced at the nearest residential receptors as a result of construction activities have been calculated using the activity LAeq method outlined in BS 5228 1:2009+A1 2014 – Code of Practice for noise and vibration control on construction and open sites – Part 1 Noise.

Tables 8.12 – 8.14 detail the plant items/activities during the different phases of construction with the associated source reference from BS 5228: 2009+A1 2014. The closest noise sensitive receptors to the proposed development site are located at distances of approximately 10m. Construction noise calculations have been conducted at a minimum distance of 10m without mitigation which represents a worst-case scenario.

Table 8.12 – Predicted construction noise predictions associated with Site Clearance

Plant Item	BS 5228 Reference	Construction Noise Level LAeq dB @10m
Tracked Excavator	C.2 22	72
Dump Truck	C.4.2	78
Dozer	C2.13	78
Loading Lorry	C.2.29	79
Calculated sound pressure levels LAeq dB at distances from receptors with mitigation in place		
N1 13m LAeq,1hr	68	
N2 30m LAeq,1hr	58	
N3 15m LAeq,1hr	66	
N4 15m LAeq,1hr	66	
N5 20m LAeq,1hr	63	
N6 13mLAeq,1hr	68	

Table 8.13 – Foundation Pour Noise Sources

Plant Item	BS 5228 Reference	Construction Noise Level LAeq dB @ 10m
Tracked Excavator	C2.22	72
Concrete Pump	C3.25	78
Poker Vibrator	C4.33	78
Compressor	D7.6	77
Calculated sound pressure levels LAeq dB at distances from receptors with mitigation in place		
N1 13m LAeq,1hr	67	
N2 30m LAeq,1hr	58	
N3 15m LAeq,1hr	65	
N4 15m LAeq,1hr	65	
N5 20m LAeq,1hr	62	
N6 13mLAeq,1hr	67	

Table 8.14 – General Construction Activities Noise Sources

Plant Item	BS 5228 Reference	Construction Noise Level LAeq dB @10m
Generator (enclosed)	D6.	61
Articulated Truck	Note	77
Cement mixer truck pumping concrete	C4.25	82
Tower Crane	C4.48	76
Calculated sound pressure levels LAeq dB at distances from receptors with mitigation in place		
N1 13m LAeq,1hr	66	
N2 30m LAeq,1hr	57	
N3 15m LAeq,1hr	62	
N4 15m LAeq,1hr	65	
N5 20m LAeq,1hr	62	
N6 13mLAeq,1hr	66	

The predicted construction noise levels are based on the closest point on site to the closest receptor. Provided that noise mitigation measures are implemented, it is predicted that the daily noise limit of 75 dB(A) LAeq, 7am – 6pm (11hr) will not be exceeded at the closest receptors to the site.

Construction Traffic Noise

The maximum volume of construction traffic will be associated with the bulk excavation which will include up to 70 HGV movements per day on the haul routes to and from the site along public roads, the resulting average predicted traffic noise level at the closest receptors is calculated as follows:

The predicted noise levels at any receptor located within 5m of the haul route road has been calculated using a standard international acoustical formula as described below.

$$LA_{eq, T} = SEL + 10\log_{10}(N) - 10\log_{10}(T) + 20\log_{10}(r_1/r_2) \text{ dB}$$

where

- LA_{eq} the equivalent continuous sound level over time period (T) (3600 sec);
- SEL is the A weighted Sound Exposure Level of the noise event (77dB);
- N is the number of events over the time period T (70);
- r₁ is the distance at which SEL is assessed (5m)
- r₂ is the closest distance to the receptor from the road (10m)

The calculations are based on a 11-hour working day a maximum, a Sound Exposure Level of 77dBA for the trucks and the minimum distance between the local road passing by each of the nearest noise sensitive receptors to the public road (10m). No attenuation, above geometric spreading, has been considered within these calculations and they may be considered the worst case scenario.

The maximum predicted LA_{eq}, period values as a result of the HGV traffic movements at the nearest noise sensitive receptors located along the haul route roads is predicted to be 54dBA, LA_{eq}, period.

It is not expected that the predicted short-term increase in HGV movements associated with the construction phase of the development will have an adverse impact on the existing noise climate of the wider area or on local receptors.

Construction Generated Vibration

The most significant potential sources of ground borne vibrations that may be generated during the construction phase of the development will be generated by the following practices:

- Movement of site vehicles tracked excavators and dump trucks on ground surfaces
- Pneumatic breaking of ground surfaces
- Piling
- Hard core surfaces and haul road compaction with vibro-rolling vehicles
- Road construction surface vibro-rolling

It is predicted that vibration levels associated with construction activities at the closest receptors to the site will not exceed 7.5mm/sec PPV. Human response to ground borne vibrations will be perceptible at levels between 0.14 to 1.0 mm/sec PPV.

The Table below summarises the identified likely significant effects of the proposed development during the construction phase.

Table 8.15 – Summary of Construction Phase Likely Significant Effects

Likely Effect	Significant	Quality	Significance	Extent	Probability	Duration
Construction Noise	Phase	Negative	Moderate	Local	Likely	Temporary to Short-Term
Construction Vibration	Phase	Negative	Not Significant	Local	Likely	Temporary to Short-Term

8.8.2 Operational Phase

Residual Noise Impact: The operational phase of the development will not adversely impact the existing noise climate at local receptors.

Residual Vibration Impact: The operational phase of the development will not generate ground borne vibration levels.

Table 8.16 below summarises the identified likely significant effects of the proposed development during the operational phase.

Table 8.16 – Summary of Operational Phase Residual Effects

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Operational Phase Noise	Neutral	Not Significant	Local	Likely	Long-Term	Residual

8.9 MONITORING

8.9.1 Construction Phase Noise & Vibration Monitoring

8.9.1.1 Noise Monitoring

Prior to the commencement of the site construction activities, a programme of continuous noise monitoring at the closest receptors to the site shall be undertaken to assess and manage the impact that site activities may have on ambient noise levels at receptors. These surveys will establish the noise impact of site activities at the closest noise sensitive receptors to assess compliance with the specified construction noise limit criteria and to ensure that mitigation and control measures are being implemented as required.

All noise monitoring data will be compiled into a monthly technical monitoring report which will include a full assessment of the potential noise impacts arising from site construction activities.

The environmental noise measurements will be completed in accordance with the requirements of ISO 1996-1: 2017: Acoustics – Description, measurement and assessment of environmental noise and with regard to the EPA's 2016 Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4). The measurement parameters to be recorded include LAeq, LA90, LA10 and LMax, and 1/3 Octave Frequency analysis to allow tonal noise to be identified.

All live noise monitoring systems shall be programmed to include audio recording to allow construction management identify the source of high noise. The systems shall be capable of transmitting live text and email alerts to nominated construction staff should a noise limit be approached or exceeded.

Noise monitoring shall be conducted in proximity to the closest noise sensitive receptors to the site. The noise monitoring locations (N) in proximity to the closest receptors are shown below in Figure 8.6.

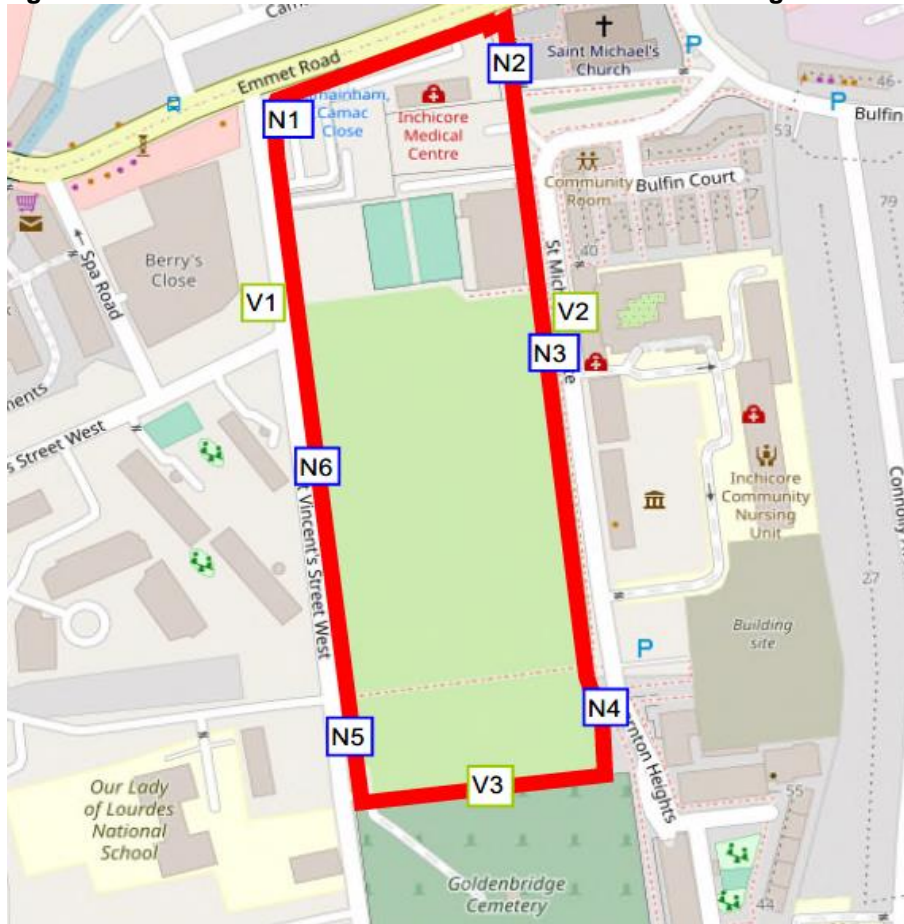
8.9.1.2 Vibration Monitoring

In order to ensure that site construction activities are conducted to minimise the vibration impacts on the receiving environment, it is proposed that structural vibration monitoring shall be implemented during the course of the construction phase. It is proposed that vibration monitoring will be conducted at the closest adjacent properties to the site boundaries using live data logging vibration monitors and geophones with live text and email alert functionality to ensure that if vibration levels approach or exceed the specified warning and limit values, nominated construction staff shall be instantly alerted to cease at the earliest instance and appropriate mitigation measures may then be implemented to minimise the ongoing impact on the monitored structures.

The monitoring points chosen for locating the geophone of the vibration measuring instrument will be determined according to the guidelines in British Standard BS 7385: Evaluation and measurement for vibration in buildings, Part 1 1990 Guide for measurement of vibrations and evaluation of their effects on buildings and Part 2 1993 Guide to damage levels arising from ground borne vibration.

The vibration monitoring locations (V) in proximity to the closest receptors are shown below in Figure 8.6.

Figure 8.6 – Construction Phase Noise & Vibration Monitoring Locations



8.9.2 Operational Phase Monitoring

Monitoring is not required during the operational phase.

8.10 REINSTATEMENT

Reinstatement issues are not relevant to this Chapter of the EIAR, with reference to the construction and operational phase.

8.11 INTERACTIONS

The principal interactions between Noise & Vibration impacts, Human Beings and Architectural Heritage have been addressed in this chapter which describes in detail the mitigation measures that shall be implemented to ensure that human health and residential amenity are not adversely impacted by any aspect of the construction or operational phases of the development.

8.12 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no difficulties encountered in compiling this Chapter of the EIAR.

9.0 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

9.1 INTRODUCTION

This chapter was prepared by Richard Butler of Model Works Ltd. Richard has degrees in Landscape Architecture (B.L.Arch, University of Pretoria, 1995) and Town Planning (MSc Spatial Planning, Dublin Institute of Technology, 2007), is a member of the Irish Landscape Institute and the Irish Planning Institute and has over 20 years' experience in Landscape and Visual Impact Assessment (LVIA). In the last number of years Richard has prepared LVIA chapters for EIA for the following projects among others:

- Guinness Quarter, Dublin;
- O'Devaney Gardens SHD, Dublin;
- Dublin Arch (Connolly Quarter);
- Augustine Hill (Ceannt Station), Galway;
- Pembroke Quarter Phase 1, Dublin;
- St Joseph's House and Adjoining Properties SHD, Dun Laoghaire Rathdown;
- Howth Road SHD, Co. Fingal;
- Sandford Road SHD, Dublin;
- Charlestown Place SHD;
- Parkside 4 SHD and Parkside 5B and 6 SHD, Dublin;
- Scotch Hall SHD, Drogheda;
- Griffith Avenue SHD, Dublin;
- Concorde SHD, Dublin;
- Leopardstown Hospital, Dun Laoghaire Rathdown.

9.2 STUDY METHODOLOGY

The LVIA was prepared with reference to:

- Guidelines for Landscape and Visual Impact Assessment, 3rd edition, 2013 (GLVIA), published by the Landscape Institute;
- Technical Information Note on Townscape Character Assessment, 2016, published by the Landscape Institute;
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022, published by the EPA;
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, 2018, published by the Department of Housing, Planning and Local Government.

The EPA guidelines 2022 provide a general methodology and impact ratings for all types of specialist assessments. The GLVIA provides specific guidelines for landscape and visual impact assessments. Therefore, a combination of the EPA guidelines, the Landscape Institute guidelines and professional experience has informed the methodology for this assessment.

9.2.1 Key Principles of the GLVIA

9.2.1.1 Use of the Word 'Townscape'

The GLVIA recommends that the word 'townscape' be used (instead of landscape) in urban areas, where a proposed development's receiving environment is dominated by built elements. The GLVIA defines townscape as *"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"*. As the subject site is located in the urban environment, the word townscape is used in this chapter. The word landscape is used in reference to green spaces or vegetation within the townscape.

9.2.1.2 Use of the Term 'Effect' vs 'Impact'

The GLVIA requires that the terms 'impact' and 'effect' be clearly distinguished and consistently used. 'Impact' is defined as the action being taken, e.g. the introduction of buildings, infrastructure or landscaping to the townscape. 'Effect' is defined as the change resulting from those actions, e.g. change in townscape character or in the amenity value of a view.

9.2.1.3 Assessment of Both ‘Townscape’ and ‘Visual’ Effects

The GLVIA requires that effects on views/visual amenity be assessed separately from the effects on townscape, although the two topics are inherently linked.

- ‘Townscape’ results from the interplay between the physical, natural and cultural components of our surroundings. Different combinations and spatial distribution of these elements create variations in townscape character. Townscape impact assessment identifies the changes to these elements and characteristics which would result from a proposed development and assesses the significance of those changes on the townscape as a resource.
- Visual impact assessment is concerned with changes that arise in the composition of available views, the response of people to these changes and the overall effects on the area’s visual amenity.

9.2.2 Methodology for Assessment of Townscape Effects

The assessment of potential townscape effects involves (a) classifying the sensitivity of the townscape receptors (the main elements, features, characteristics and character areas of the townscape), (b) classifying the potential magnitude of change to each receptor, and (c) combining these factors to arrive at an assessment of the significance of the effects on each receptor - and the quality of the effects (positive, neutral or negative).

9.2.2.1 Townscape Sensitivity

The sensitivity of the townscape is a function of its character, which may be determined by its land use pattern, urban grain, building typologies and architecture, cultural and natural heritage elements, and the quality of the public realm. These factors determine the value that is placed on the townscape. The nature and scale of the proposed development is also taken into account (a particular townscape can have varying sensitivity to different development types), as are any trends of change, and relevant policy. Five categories are used to classify sensitivity (Table 9.1).

Table 9.1 – Categories of Townscape Sensitivity

Sensitivity	Description
Very High	Areas where the townscape exhibits very strong, positive character with valued elements, features and characteristics that combine to give an experience of unity, richness and harmony. The townscape character is such that its capacity to accommodate change is very low. These attributes are recognised in policy or designations as being of national or international value and the principal management objective for the area is protection of the existing character from change.
High	Areas where the townscape exhibits strong, positive character with valued elements, features and characteristics. The townscape character is such that it has limited/low capacity to accommodate change. These attributes are recognised in policy or designations as being of national, regional or county value and the principal management objective for the area is the conservation of existing character.
Medium	Areas where the townscape has certain valued elements, features or characteristics but where the character is mixed or not particularly strong, or has evidence of alteration, degradation or erosion of elements and characteristics. The townscape character is such that there is some capacity for change. These areas may be recognised in policy at local or county level and the principal management objective may be to consolidate townscape character or facilitate appropriate, necessary change.
Low	Areas where the townscape has few valued elements, features or characteristics and the character is weak. The character is such that it has capacity for change; where development would make no significant change or would make a positive change. Such townscapes are generally unrecognised in policy and the principal management objective may be to facilitate change through development, repair, restoration or enhancement.
Negligible	Areas where the townscape exhibits negative character, with no valued elements, features or characteristics. The character is such that its capacity to accommodate change is high; where development would make no significant change or would make a positive change. Such townscapes include derelict industrial lands, as well as sites or areas that are designated for a particular type of development. The principal management objective for the area is to facilitate change in the townscape through development, repair or restoration.

Note on definitions used in this assessment

The definitions in Table 9.1 (townscape sensitivity), 9.2 (magnitude of townscape change), 9.4 (viewpoint sensitivity) and 9.5 (magnitude of visual change) are not taken from either the GLVIA or the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022. Both of these guidance documents require that classifications of sensitivity and magnitude of change (such as high, medium, low, etc.) be used in the assessment process (see EPA Guidelines Figure 3.4 and GLVIA Box 3.1, Paragraph 3.26 and Figure 3.5) but neither guidance document provides definitions for such classifications.

The GLVIA specifically avoids being prescriptive in this regard (GLVIA paragraph 1.20): *“The guidance concentrates on principles... It is not intended to be prescriptive, in that it does not provide a detailed 'recipe' that can be followed in every situation. It is always the primary responsibility of any landscape professional carrying out an assessment to ensure that the approach and methodology adopted are appropriate to the particular circumstances.”*

The EPA Guidelines state (in Section 3, p.49): *“While guidelines and standards help ensure consistency, the professional judgement of competent experts can play an important role in the determination of significance. These experts may place different emphases on the factors involved. As this can lead to differences of opinion, the EIAR sets out the basis of these judgements so that the varying degrees of significance attributed to different factors can be understood.”*

The GLVIA and EPA Guidelines thus require that the factors used in arriving at significance conclusions (i.e., classifications of sensitivity and magnitude) should be explained in the EIAR, but the guidelines do not provide the explanations themselves.

It is for this reason that the definitions in Tables 9.1, 9.2, 9.4 and 9.5 are provided in this section. These definitions have been developed and refined by LVIA practitioners in Ireland and the UK, including the chapter author, over decades of practice. They are not standard, i.e., the classifications/definitions used in this assessment may differ from those used by other practitioners. However, the author considers them to be reasonable and appropriate for the purpose of classifying the significance of landscape/townscape and visual effects and the same definitions have been used in many previous LVIA reports/chapters prepared by the author and accepted by the planning authorities.

9.2.2.2 Magnitude of Townscape Change

Magnitude of change is a factor of the scale, extent and degree of change imposed on the townscape by a development, with reference to its key elements, features and characteristics, and any affected surrounding character areas (also known as ‘townscape receptors’). Five categories are used to classify magnitude of change (Table 9.2).

Table 9.2 – Categories of Townscape Change

Sensitivity	Description
Very High	Change that is large in extent, resulting in the loss of or major alteration to key elements, features or characteristics of the townscape, and/or introduction of large elements considered totally uncharacteristic in the context. Such development results in fundamental change in the character of the townscape.
High	Change that is moderate to large in extent, resulting in major alteration to key elements, features or characteristics of the townscape, and/or introduction of large elements considered uncharacteristic in the context. Such development results in change to the character of the townscape.
Medium	Change that is moderate in extent, resulting in partial loss or alteration to key elements, features or characteristics of the townscape, and/or introduction of elements that may be prominent but not necessarily substantially uncharacteristic in the context. Such development results in change to the character of the landscape.
Low	Change that is moderate or limited in scale, resulting in minor alteration to key elements, features or characteristics of the townscape, and/or introduction of elements that are not uncharacteristic in the context. Such development results in minor change to the character of the landscape.
Negligible	Change that is limited in scale, resulting in no alteration to key elements features or characteristics of the townscape, and/or introduction of elements that are characteristic of the context. Such development results in no change to the townscape character.

(Refer to note on definitions following Table 9.1)

9.2.2.3 Significance of Effects

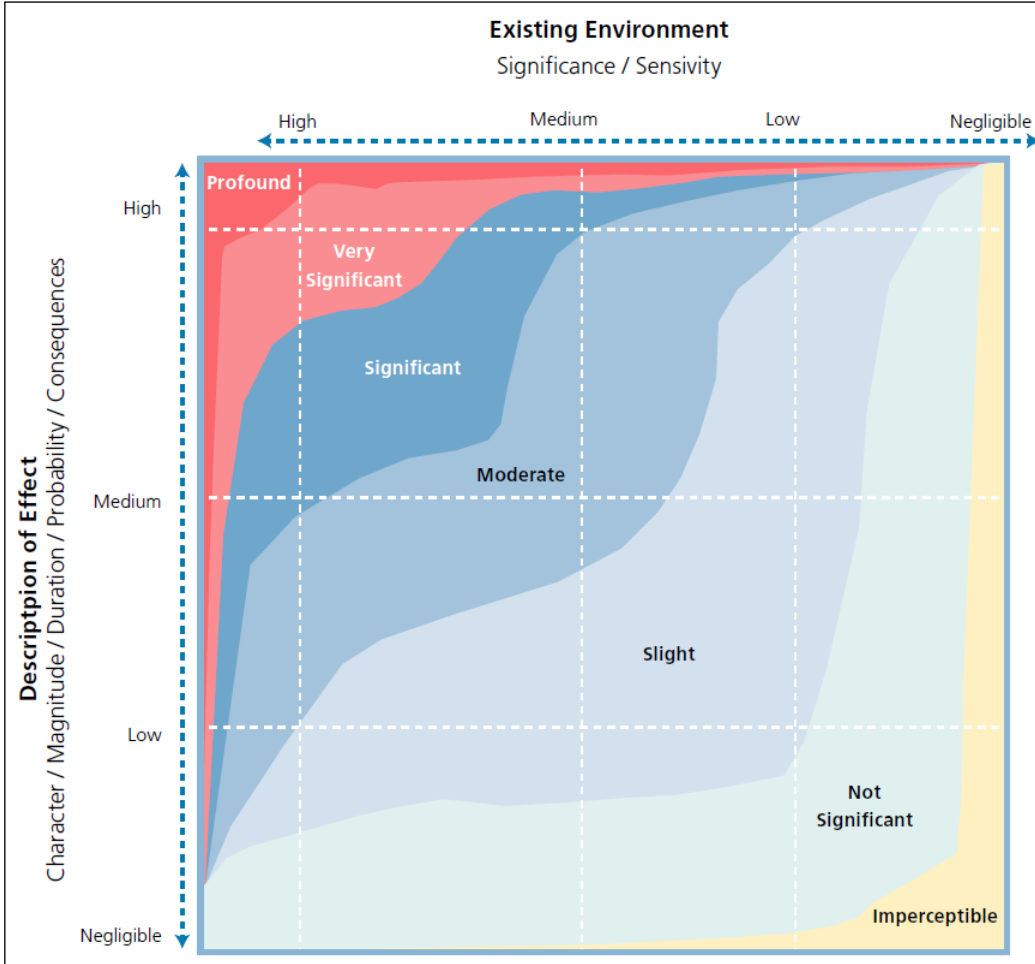
To classify the significance of effects the magnitude of change is measured against the sensitivity of the townscape using the guide in Table 9.3 below. This matrix is only a guide. The assessor also uses professional judgement informed by their expertise, experience and common sense to arrive at a classification of significance that is reasonable and justifiable.

Table 9.3 – Guide to Classification of Significance of Townscape and Visual Effects

		Sensitivity of the Townscape/View				
		Very High	High	Medium	Low	Negligible
Magnitude of Townscape/Visual Change	Very High	Profound	Profound to Very Significant	Very Significant to Significant	Moderate	Slight
	High	Profound to Very Significant	Very Significant	Significant	Moderate to Slight	Slight to Not Significant
	Medium	Very Significant to Significant	Significant	Moderate	Slight	Not Significant
	Low	Moderate	Moderate to Slight	Slight	Not significant	Imperceptible
	Negligible	Slight	Slight to Not Significant	Not significant	Imperceptible	Imperceptible

The matrix (Table 9.3) above is derived from the EPA Guidelines 2022 (specifically Figure 3.4 of the Guidelines – see below).

Figure 9.1 – ‘Chart showing typical classifications of the significance of impacts’



(Source: Figure 3.4 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022)

The matrix (Table 9.3) and the EPA chart (Figure 9.1) are only a *guide* to the classification of impact significance. The assessor also uses professional judgement informed by their expertise, experience and common sense to arrive at a classification that is reasonable and justifiable. In the EPA guidelines the chart above is accompanied by a footnote that states: *“The depiction of significance classifications is indicative and should not be relied on as being definitive. It is provided for general guidance purposes”* (EPA guidelines Section 3, page 53; emphasis added). For example, according to the EPA chart a change of high magnitude affecting a receptor of medium sensitivity could be classified as either ‘significant’ or ‘moderate’. That judgement must be made by the assessor.

9.2.3 Methodology for Assessment of Visual Effects

Assessment of visual effects involves identifying a number of key/representative viewpoints in the site’s receiving environment, and for each one of these: (a) classifying the viewpoint sensitivity, (b) classifying the magnitude of change which would result in the view (informed by photomontages of the proposed development), and (c) combining these factors to arrive at a classification of significance of the effects on the view.

9.2.3.1 Sensitivity of the Viewpoint/Visual Receptor

Viewpoint sensitivity is a function of two main considerations:

- **Susceptibility of the visual receptor to change.** This depends on the occupation or activity of the people experiencing the view, and the extent to which their attention is focused on the views or visual amenity they experience at that location. Visual receptors most susceptible to change include residents at home, people engaged in outdoor recreation focused on the landscape (e.g. trail users), and visitors to heritage attractions and places of congregation where the setting contributes to the experience. Visual receptors less sensitive to change include travelers on road, rail and other transport routes (unless on recognised scenic routes),

people engaged in outdoor recreation where the surrounding landscape does not influence the experience, and people in their place of work or shopping.

- **Value attached to the view.** This depends to a large extent on the subjective opinion of the visual receptor but also on factors such as policy and designations (e.g. scenic routes, protected views), or the view or setting being associated with a heritage asset, visitor attraction or having some other cultural status (e.g. by appearing in arts).

Five categories are used to classify a viewpoint's sensitivity (Table 9.4):

Table 9.4 – Categories of Viewpoint Sensitivity

Sensitivity	Description
Very High	Iconic viewpoints (views towards or from a townscape feature or area) that are recognised in policy or otherwise designated as being of national value. The composition, character and quality of the view are such that its capacity for change is very low. The principal management objective for the view is its protection from change.
High	Viewpoints that are recognised in policy or otherwise designated as being of value, or viewpoints that are highly valued by people that experience them regularly (e.g. views from houses or outdoor recreation amenities focused on the townscape). The composition, character and quality of the view may be such that its capacity to accommodate change may or may not be low. The principal management objective for the view is its protection from change that reduces visual amenity.
Medium	Views that may not have features or characteristics that are of particular value, but have no major detracting elements, and which thus provide some visual amenity. These views may have capacity for appropriate change and the principal management objective is to facilitate change to the composition that does not detract from visual amenity, or which enhances it.
Low	Views that have no valued feature or characteristic, and where the composition and character are such that there is capacity for change. This category also includes views experienced by people involved in activities with no particular focus on the landscape. For such views the principal management objective is to facilitate change that does not detract from visual amenity or enhances it.
Negligible	Views that have no valued feature or characteristic, or in which the composition may be unsightly (e.g. in derelict landscapes). For such views the principal management objective is to facilitate change that repairs, restores or enhances visual amenity.

(Refer to note on definitions following Table 9.1.)

9.2.3.2 Magnitude of Change to the View

Classification of the magnitude of change takes into account the size or scale of the intrusion of development into the view (relative to the other elements and features in the composition, i.e. its relative visual dominance), the degree to which it contrasts or integrates with the other elements and the general character of the view, and the way in which the change will be experienced (e.g. in full view, partial or peripheral view, or in glimpses). It also takes into account the geographical extent of the change, as well as the duration and reversibility of the visual effects. Five categories are used to classify magnitude of visual change to a view (Table 9.5):

Table 9.5 – Categories of Magnitude of Visual Change

Sensitivity	Description
Very High	Full or extensive intrusion of the development in the view, or partial intrusion that obstructs valued features or characteristics, or introduction of elements that are completely out of character in the context, to the extent that the development becomes dominant in the composition and defines the character of the view and the visual amenity.
High	Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features, or introduction of elements that may be considered uncharacteristic in the context, to the extent that the development becomes co-dominant with other elements in the composition and affects the character of the view and the visual amenity.
Medium	Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context, resulting in change to the composition but not necessarily the character of the view or the visual amenity.
Low	Minor intrusion of the development into the view, or introduction of elements that are not uncharacteristic in the context, resulting in minor alteration to the composition and character of the view but no change to visual amenity.

Negligible	Barely discernible intrusion of the development into the view, or introduction of elements that are characteristic in the context, resulting in slight change to the composition of the view and no change in visual amenity.
-------------------	---

(Refer to note on definitions following Table 9.1.)

9.2.3.3 Significance of Visual Effects

As with townscape effects, to classify the significance of visual effects, the magnitude of change to the view is measured against the sensitivity of the viewpoint, using the guidance in Table 9.3 and Figure 9.1 above.

9.2.4 Quality of Effects

In addition to predicting the significance of the effects, EIA methodology requires that the quality of the effects be classified as positive/beneficial, neutral, or negative/adverse.

For townscape to a degree, but particularly for visual effects, this is an inherently subjective exercise. This is because townscape and visual amenity are perceived by people and are therefore subject to variations in the attitude and values - including aesthetic preferences - of the receptor. One person's attitude to a development may differ from another person's, and thus their response to the effects of a development on a townscape or view may vary.

Additionally, in certain situations there might be policy encouraging a particular development in an area, in which case the policy is effectively prescribing townscape and visual change. If a development achieves the objective of the policy the resulting effect might be considered positive, even if the townscape character or views are profoundly changed. The classification of quality of townscape and visual effects should seek to take these variables into account and provide a reasonable and robust assessment.

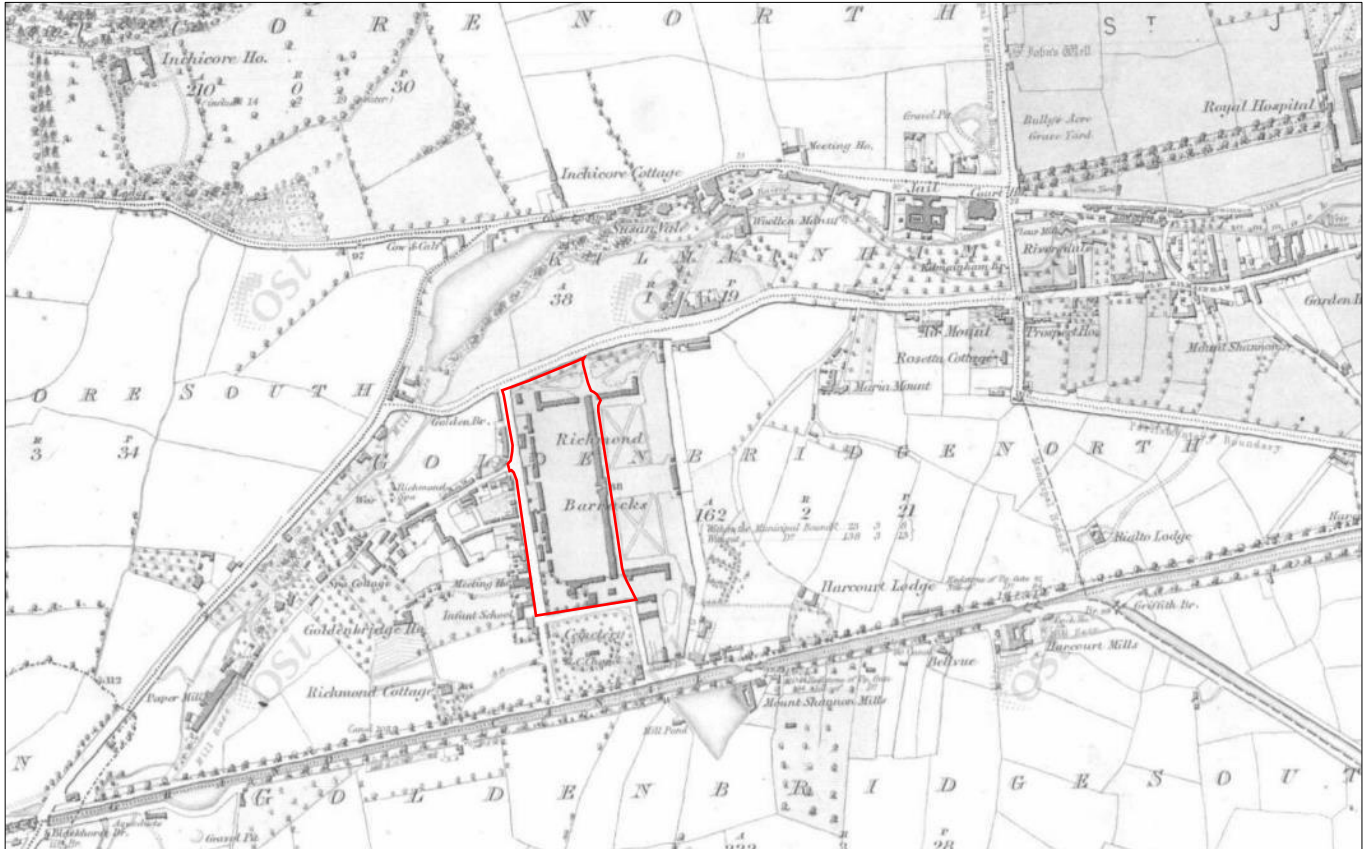
9.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

The site is located adjacent to the urban core of Inchicore. Amongst Dublin's neighbourhood centres Inchicore has a particularly complex, 'urban' character. This derives from the area's topography, its industrial and military heritage and its social history. It is an area that has undergone several periods of rapid change, resulting in a townscape made up of diverse pockets of local character, with a lack of cohesion in places.

The Ordnance Survey 6 inch map (Figure 9.2) from the mid 19th century shows that Richmond Barracks – a British Army barracks first occupied in 1814, was located outside of the main urban area of Dublin, to the west of Kilmainham in a peri-urban landscape. Inchicore House lay some distance to the north west overlooking the Liffey.

The extensive barracks was the defining element of the local landscape and there was a small, dispersed settlement immediately to the west, between the barracks and the Cammock River and Tyrconnell Road, along which there was some industry. There was no defined centre to this settlement and it is notable that the main streets at that time were St Vincent Street West and Thomas Davis Street at the interface between the barracks and the village. (St Vincent Street West subsequently receded in importance as the urban structure developed – until the construction of the Luas line, which re-intensified its use particularly for pedestrian traffic.) The Grand Canal ran just to the south of the barracks and the village.

Figure 9.2 – Ordnance Survey 6 inch map from the mid-19th century

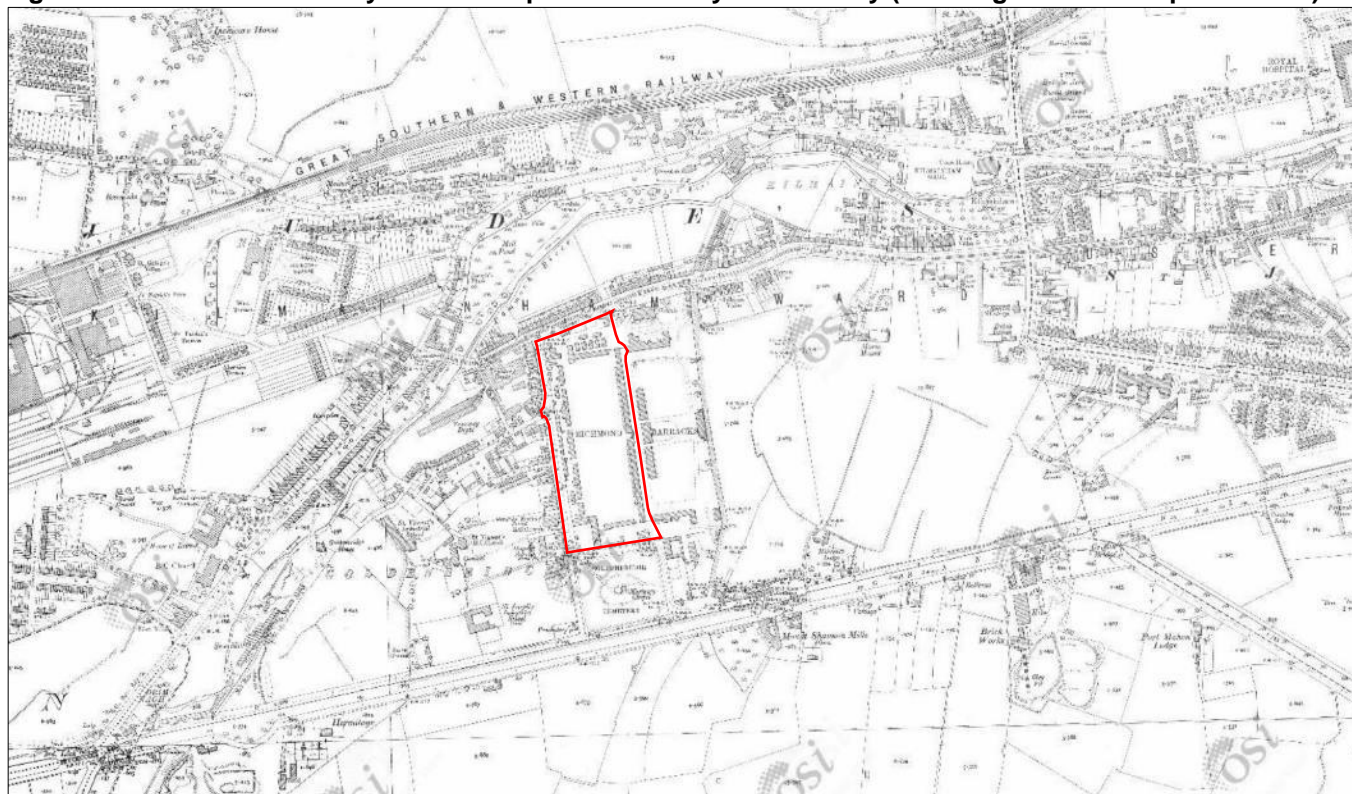


(showing main development area – see Figure 9.7 for application red line boundary)

The 25 inch map from the early 20th century shows a much changed landscape (now a ‘townscape’). The Inchiore Railway Works had been constructed to the west of the village and a tramway depot was located beside Golden Bridge, at the coming together of Tyrconnell Road, Emmet Road (now featuring a tramway) and St Vincent Street West. Extensive residential development had taken place to the north and north west, providing accommodation for the new transport industry.

Inchiore had now become a satellite urban area to the west of Dublin, contained by the railway line to the north and the canal to the south. A new urban core can be discerned around Golden Bridge, and both Emmet Road and Tyrconnell Road had become ‘urban streets’ lined with terraced houses. With the development of these streets and the surrounding suburbs, St Vincent Street West and Thomas Davis Street and the old village were somewhat ‘sidelined’ in the evolved urban structure.

Figure 9.3 – Ordnance Survey 25 inch map from the early 20th century (showing main development area)



Over the remainder of the 20th century many of the remaining gaps in the townscape were filled in. An industrial area developed in the corner between Tyrconnell Road and the canal. New residential suburbs were built to the east of Richmond Barracks, between Inchicore and Kilmmainham, and to the south across the Grand Canal. St Patrick's Athletic built their football stadium north of Emmet Road. Possibly the most significant change however was the redevelopment of the western half of the Richmond Barracks lands for public housing in the form of St Michael's Estate.

Figure 9.4 – Aerial photograph from 2000 (showing main application area)



There were further public housing developments on the west side of St Vincent’s Road West at Tyrone Place, and Thornton Heights to the south east, between the remaining part of Richmond Barracks and the canal.

The St Michael’s development was typical of its time – a dispersed, orthogonal arrangement of apartment blocks separated by parking areas and yards, with poor definition of public, communal and private space. One of the main effects of the development, from a townscape perspective, was the loss of built frontage along St Vincent’s Road West. There was a similar lack of enclosure along the newly formed St Michael’s Estate Road, which separated the estate from the remaining part of Richmond Barracks, leading to Thornton Heights. The lack of urban grain and spatial/street enclosure are clearly visible in the aerial photo below and these characteristics weakened the urban structure. The estate also had social problems, in part arising from or exacerbated by its design. St Michael’s was closed in the early 2000s and the buildings were demolished between 2004 and 2013.

Figure 9.5 – Aerial photograph from 2000



With the levelling of St Michael’s estate, a large gap has been opened in the townscape. Due to its large scale and its interface with three key streets (St Vincent’s Road West, Emmet Road and St Michael’s Estate) and a variety of surrounding character areas, the site’s redevelopment has the potential to cause significant townscape and visual impacts. These may be positive, neutral or negative.

The main elements, features and character areas of the townscape surrounding the site, i.e. the main receptors of potential townscape and visual change, are as follows:

9.3.1 Adjacent Streets/ Public Realm

9.3.1.1 Emmet Road

The site has over 100m frontage to Emmet Road (see Figure 9.6). This is a key thoroughfare not only in the townscape of Inchicore, but in the context of the wider city. It is identified as a 'Main Public Transport Route' in the Dublin City Development Plan 2016-2022 (DCDP 2016) and provides a direct connection between Inchicore and the city centre. (In the Draft Dublin City Development Plan 2022-2028 (Draft DCDP 2022) Emmet Road is also identified as an 'Historic Approach' to the city, and it forms part of one of the 'Radial Core Bus Corridors' (No. 7 Liffey Valley to City Centre) of the BusConnects plan.)

The site has frontage to Emmet Road as the road enters/exits the urban core of Inchicore. Currently, the site boundary is marked by a stone wall of various heights, behind which are parking areas, and a low, large-footprint, red brick community building (see Figure 9.6). The site frontage to Emmet Road is of poor quality and detracts from the townscape/ streetscape character and visual amenity at the gateway to the neighbourhood centre.

The potential for the site's redevelopment to change the character of the road is recognised in the DCDP 2016 (the policy for SDRA 9 St Michael's Estate): *"The development will complement the regeneration of Inchicore by encouraging a natural extension of the village centre eastwards along Emmet Road... The development of high-quality streetscape onto Emmet Road with accessible civic spaces, active frontages and an appropriate transition in scale, height and character between the village centre and the site will be promoted.* It is thus envisaged that the development would urbanise the Emmet Road streetscape along the site's northern frontage, and that the northern portion of the site would form part of the village/urban core.

Figure 9.6 – The existing site frontage to Emmet Road

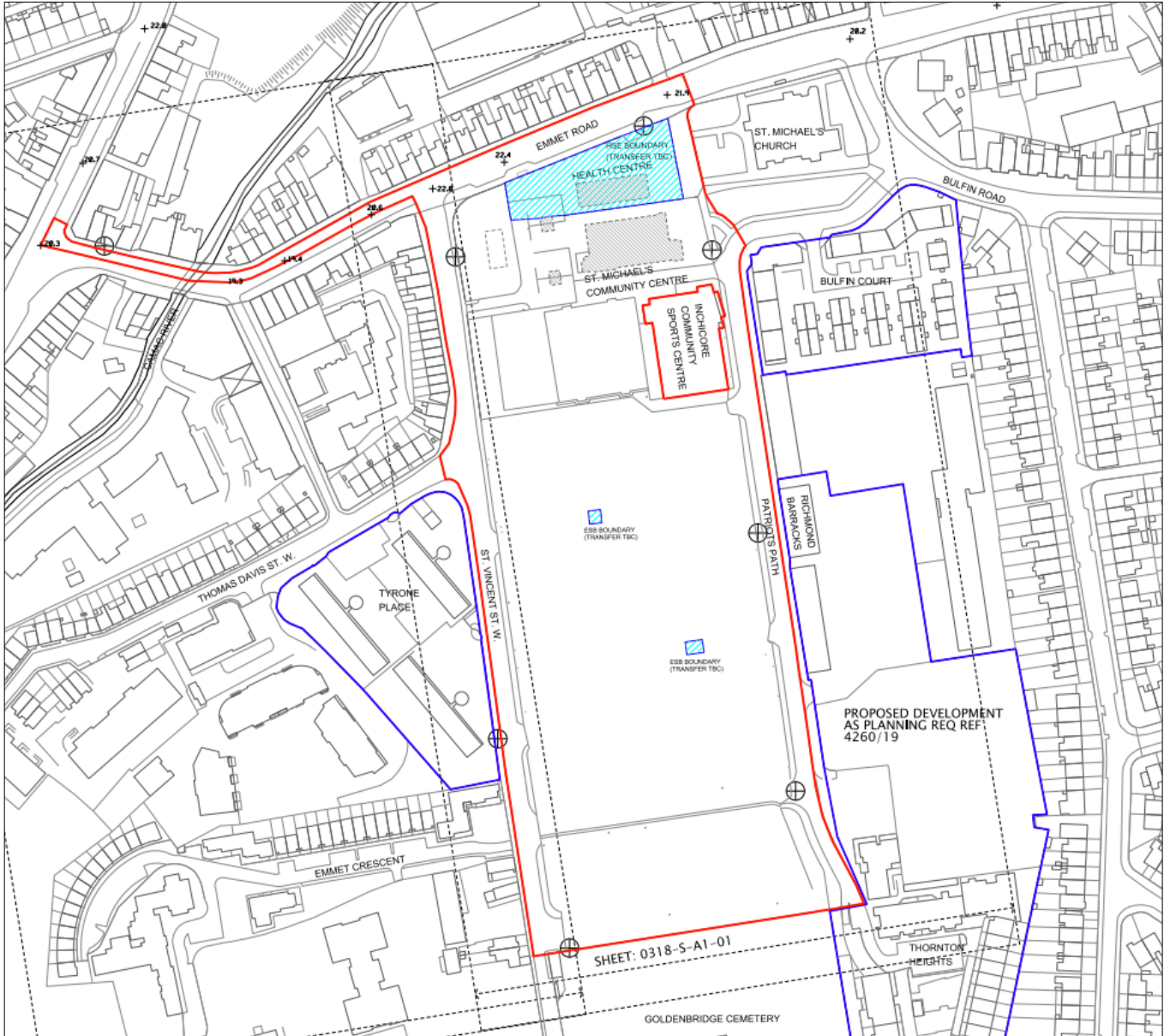


In the Draft DCDP 2022, one of the Guiding Principles for Strategic Development and Regeneration Area (SDRA) 9 'Emmet Road' is *"To encourage development that reinforces the village cores of Inchicore and Kilmainham, connected by Emmet Road, as the central spine of the area"*.

9.3.1.2 St Vincent Street West

The site has 330m frontage to St Vincent Street West (see Figure 9.7 and 9.8). This is a long, straight road that connects Emmet Road (at the site's north west corner, i.e. in the village centre) to the Grand Canal, Davitt Road and the Luas Red Line. Drimnagh Luas stop is located on the south side of the canal, accessed by a pedestrian bridge over the canal at the southern end of St Vincent Street West. Since the construction of the Luas, St Vincent Street West has become a busy pedestrian thoroughfare.

Figure 9.7 – Site Location



The site lies alongside St Vincent Street West for most of the street’s length. The site’s redevelopment will thus be critical in (a) establishing the character of the townscape as experienced along St Vincent Street West, and (b) restoring the street to its historic importance in the urban structure (refer to Figure 9.2). Currently, the character of the street is highly variable (Figure 9.8), owing to the nature of development on the west side of the street (i.e. facing the site), which includes a school, a perpendicular residential street (Emmet Crescent), a council housing development (Tyrone Court) and a terrace of street-front townhouses, before arriving in the village centre at the junction of Emmet Road.

Figure 9.8 – The frontage to St Vincent Street West, with the site to the right



9.3.1.3 St Michael’s Estate/Patriot’s Path

Patriot’s Path runs along the east side of the site for a distance of some 300m (see Figure 9.7), with a pedestrian connection to Emmet Road at the northern end, and to the Grand Canal to the south. The character of the street is very different to that of St Vincent’s Street West due to the remaining Richmond Barracks buildings which front the street opposite the site (Figures 9.9 and 9.10). These are three long, low buildings, the central building of red brick with a distinctive octagonal glazed lantern on the roof, and the flanking buildings of cut stone. The buildings were recently restored and repurposed for community and health services uses. The former parade ground behind (to the east of) the buildings has been developed as an HSE facility.

The Richmond Barracks buildings (and their rich cultural historic associations) are both a townscape opportunity - for lending character, identity and quality to the place – and a sensitivity. The barracks demand a respectful response in the future built form of the site.

Adjacent to the south of Richmond Barracks is a large vacant site and beyond that a recently developed residential scheme, Thornton Heights. This development includes apartment buildings of four to six storeys (stepping up in height towards the canal) and houses, arranged around a central courtyard.

Figure 9.9 – The Richmond Barracks frontage to Patriot’s Path opposite the site



Figure 9.10 – Richmond Barracks and the Thornton Heights development fronting Patriot’s Path

9.3.2 Surrounding Neighbourhoods/ Townscape Character Areas

While the largest number of people potentially affected by the development are in the public realm (i.e., the users of the footpaths and roads), the most sensitive receptors of visual change are the residents of the surrounding neighbourhoods. The site’s receiving environment includes several distinct neighbourhoods with varying degrees of visual exposure to the site, including:

- **Houses on Emmet Road.** There is a row of red brick Victorian houses directly opposite the site on Emmet Road. Although separated from the site by the busy road, the views from these houses will be substantially changed by the site’s redevelopment.
- **Houses fronting St Vincent Street West.** There is a terrace of houses towards the northern end of the street which faces the north western corner of the site across the narrow road. These houses are highly exposed to change on the site.
- **Thomas Davis Street West.** The street is perpendicular to St Vincent Street West so the site features in views east along the street (Figure 9.11). Thomas Davis Street is lined by houses on its north side, and by a number of apartment complexes on the southern side, including modern developments further west (less exposed to the site), and the Tyrone Court towards the east.

Figure 9.11 – The view along Thomas Davis Street towards the site

- **Tyrone Court.** The complex of three five-storey apartment buildings faces the site across St Vincent Street West, although the buildings are set at an angle to the road (Figure 9.12). A large number of the apartments in two blocks fronting the road will be highly exposed to change on the site. This estate is the largest cohort of residential visual receptors of the proposed development. It should be noted that in the Draft DCDP 2022 Tyrone Court is identified as a 'Potential Development Site'. Therefore the redevelopment of the estate is likely in the future.
- **Emmet Crescent.** Emmet Crescent is a cul-de-sac road perpendicular to St Vincent Street West. The site features in views east from the road. The most exposed residential receptors are the occupants of an apartment building at the eastern end of the road, opposite the site (Figure 9.12). Further west along the road (therefore less directly visually exposed) there are terraces of houses along the north side (Figure 9.13), including a crescent of houses arcing around the Sisters of Mercy Convent. On the south side of the road, occupying the large corner plot which also faces the site across St Vincent Street, is Our Lady of Lourdes primary school.
- **Thornton Heights.** Thornton Heights is a mixed density residential scheme, recently developed on the east side of Patriot's Walk, facing the site diagonally across the road. The northernmost apartment building has views over the southern part of the site.

Figure 9.12 – The residential buildings facing the site across St Vincent Street West



Figure 9.13 – The view along Emmet Crescent towards the site



- **Residential estate to the east.** To the east of Richmond Barracks and Thornton Heights is an extensive 20th century housing estate with a distinctive geometrical layout. The nearest houses to the site, on Connolly Avenue, are buffered from the site by Richmond Barracks (including the recently built HSE facilities). However a number of roads in the estate, e.g. Goldenbridge Avenue, Stephens Road and Goldenbridge Terrace (Figure 9.14), are so aligned that they provide framed views towards the site.

Figure 9.14 – The view along Goldenbridge Terrace towards the site



There are two commercial/ mixed use neighbourhoods in proximity to the site, which would be affected by its redevelopment:

- **Inchicore Village Centre.** The village centre extends east along Emmet Road as far as the site (and further east on the north side of the street). Although nominally a ‘village’, Inchicore has the character of a larger urban centre, with two commercial streets (Emmet Road and Tyrconnell Road), several modern high density apartment developments, a football stadium, and extensive surrounding residential suburbs. This urban core is of sufficient scale and diversity to accommodate expansion and change without losing the valued aspects of its character. This has been recognised by the DCDP 2016’s designation of the former St Michael’s Estate, including the site, as an SDRA (and the expansion of the SDRA in the Draft DCDP 2022). It is the policy of the DCDP 2016 and the Draft DCDP 2022 that the ‘village centre’ would be expanded and changed in character by the site’s redevelopment.

Figure 9.15 – The view east along Emmet Road from Inchicore ‘village centre’ towards the site



- **Bulfin Road Centre.** Towards the western end of Bulfin Road, to the east of the site, is a row of houses converted to shops. Although only a small local centre, the wide pavement in front of the shops provides a casual gathering place in the public realm, and there are views towards the site from this space (Figure 9.16).

Figure 9.16 – The view west along Bulfin Road towards the site



9.3.3 Other Sensitive Receptors

In addition to the streets/ public realm and residential neighbourhoods, there are a number of heritage features in the receiving environment which could be affected by changes in their setting. These include:

- **Richmond Barracks (a protected structure).** Refer to Section 9.3.1.3 and Figures 9.9 and 9.10 above.
- **St Michael's Church.** The church, a protected structure, is located to the east of the site, also fronting Emmet Road (Figure 9.17). The site forms part of the church's setting, and features in views of the church from Emmet Road, Patriot's Path and Bulfin Road. Redevelopment of the site has significant potential to affect the context of St Michael's church, and to change the composition and character of views of the church.
- **Goldenbridge Cemetery.** The cemetery lies to the south of the site, between the site and the Grand Canal (see Figure 9.2). It is a 19th century 'garden cemetery' (designed as both a burial place and a park – an early example of Green Infrastructure), featuring numerous mature trees and enclosed by a high stone wall. The mortuary chapel at the centre of the cemetery is a protected structure, as are the gate lodge and the boundary walls. The cemetery's north wall and gate lodge have a direct interface with the site and will thus unavoidably be affected by the site's redevelopment. The interior of the cemetery has less potential to be affected, being buffered from the site by the high boundary walls and the trees.
- **The Grand Canal.** As well as being a valued industrial heritage feature, the canal is an ecological corridor and functions as a greenway, providing recreation space and an off-road pedestrian and cycle route into the city centre (Figure 9.18). The canal and adjacent lands are a Conservation Area (CA). The CA designation broadens to cover the entire Goldenbridge Cemetery and thus extends to the site boundary. The CA designation has implications for development in the surrounding townscape (including the site), although it should be noted that as a continuous cross-city route the canal traverses a wide range of townscape character areas of various quality.
- **Sisters of Mercy Convent.** The convent and attached church, St Vincent's, are located to the west of the site on Emmet Crescent. Both are protected structures. Although removed from the site by 140m, along a street of apartments, houses and a school, the convent chapel and the site are intervisible. Development on the site could have an indirect effect on the protected structures' setting.

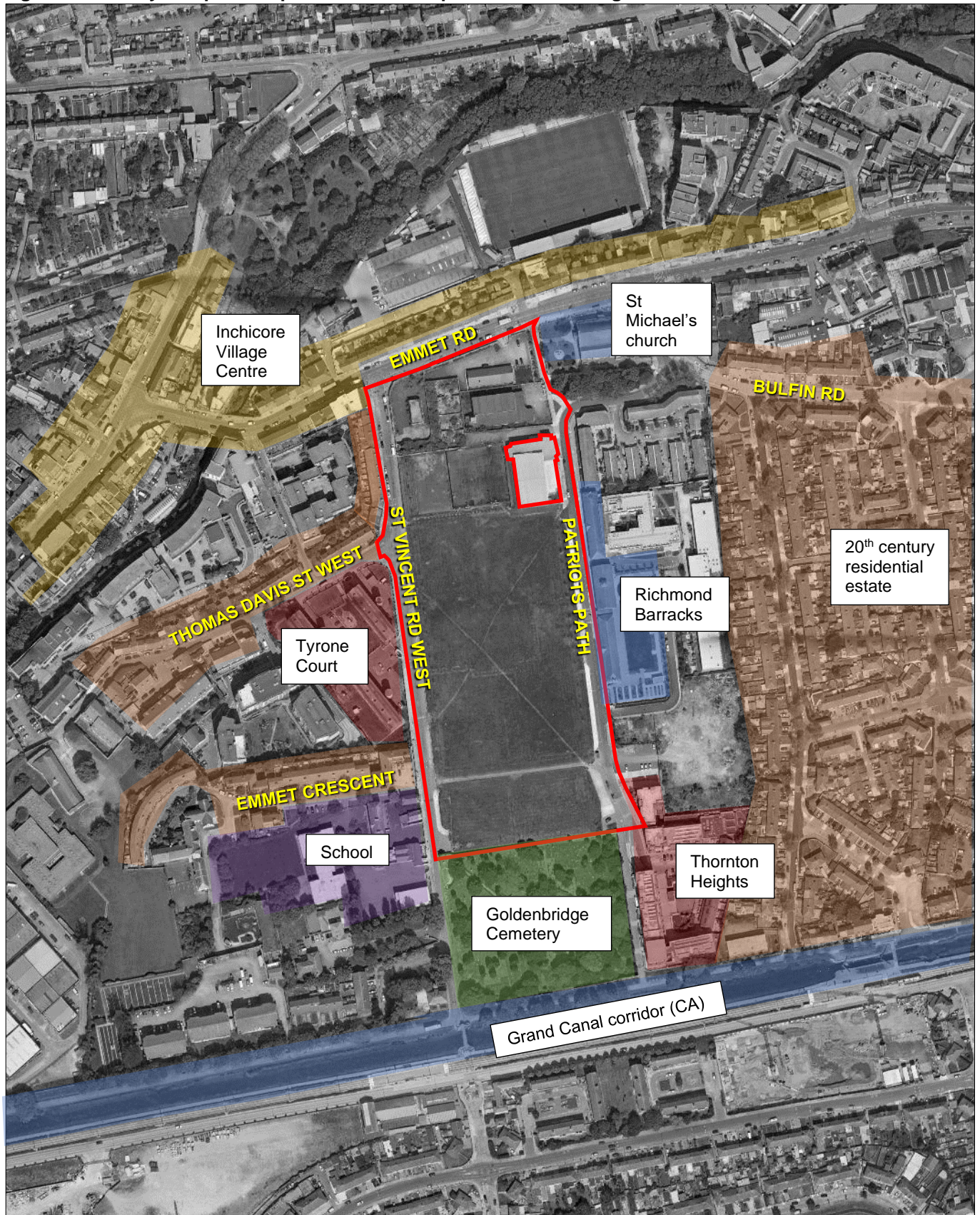
Figure 9.17 – St Michael’s Church alongside the site on Emmet Road



Figure 9.18 – A view from the Grand Canal towards the site, with Goldenbridge Cemetery to the right beyond the canal



Figure 9.19 – Key receptors of potential townscape and visual change



(Red line is indicative, showing the main proposed development area. For precise red line boundary refer to Figure 9.7 above.)

9.3.4 Relevant Planning Policy – Dublin City Development Plan 2016-2022

The DCDP 2016 prescribed the site's redevelopment by designating it a SDRA. This indicates that Dublin City Council (DCC) considers the receiving environment suitable for significant townscape and visual change.

The following policies of the DCDP 2016 are relevant to the assessment of potential townscape and visual impacts.

9.3.4.1 Land Use Zoning

The site is zoned Z14: *“To seek the social, economic and physical development and/or rejuvenation of an area with mixed use of which residential and ‘Z6’ would be the predominant uses”*.

9.3.4.2 SDRA 9 St Michael's Estate

The site is a large part of the area identified as SDRA 9 St Michael's Estate (including adjoining Keogh Barracks/Richmond Barracks).

Development in accordance with the SDRA policy is already well progressed on the eastern portion of the SDRA area, with the completion of the restoration of Richmond Barracks, the construction of the HSE primary care and community nursing facilities, and the development of Thornton Heights.

The most notable 'guiding principles' stated in the DCDP 2016 for SDRA 9 are as follows:

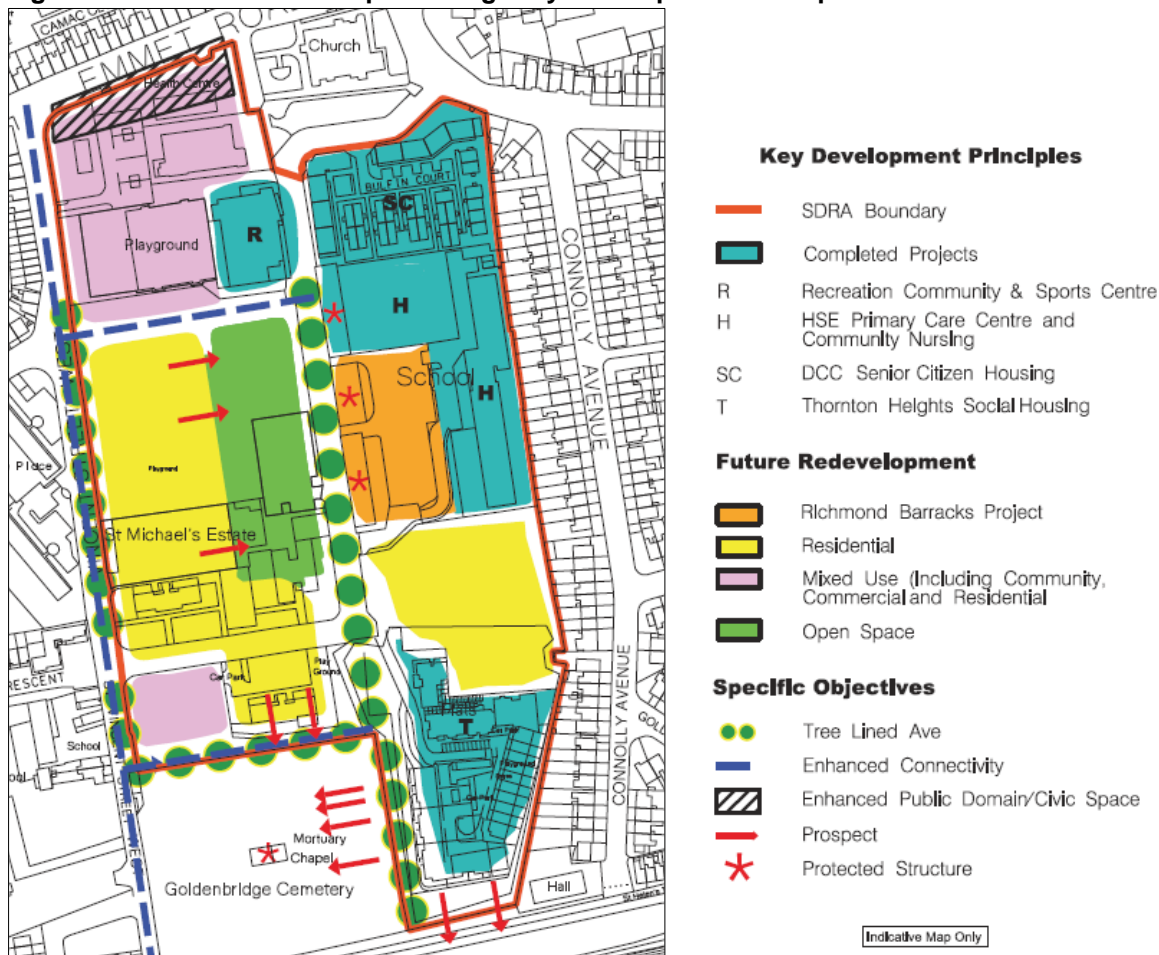
- *“The development of a high-quality, vibrant, mixed-use urban quarter will be promoted; new facilities will be located in accessible locations and will maximise the opportunities to connect with the wider neighbourhood”*
- *The development will complement the regeneration of Inchicore by encouraging a natural extension of the village centre eastwards along Emmet Road; the development will provide strong connections between the site and the functions of the village centre, for which a local environmental improvements plan is proposed*
- *The development of high-quality streetscape onto Emmet Road with accessible civic spaces, active frontages and an appropriate transition in scale, height and character between the village centre and the site will be promoted*
- *Strong permeability will be sought through the site, including pedestrian and cyclist connections, to achieve strong north-to-south connections between Emmet Road and the Luas/Grand Canal corridor and east-to-west connections between St Vincent Street West and Bulfin Road; active streetscapes along these routes will be promoted*
- *Variety in housing tenures and unit types will be sought in order to achieve a balanced and sustainable community*
- *The important heritage features on, and adjoining, the site, shall be respected and highlighted by urban design with particular regard to the tourism, heritage, community and amenity value of assets such as St Michael's Church, Richmond Barracks, Goldenbridge Cemetery and the Grand Canal*
- *Innovative proposals that create a landmark destination within the city for combined facilities of a community, recreational, leisure and sports nature will be promoted; such facilities shall integrate positively with the existing sports facilities on site*
- *The development of high-quality senior citizen housing. This will be located on the site between Thornton Heights and Richmond Barracks.”*

The most notable spatial guidance for the SDRA area (Figure 9.20 below) is as follows:

- The provision of a wide, linear area of 'enhanced public domain/civic space' along Emmet Road.
- The provision of a substantial mixed use area (including community, commercial and residential) in the northern part of the site fronting the linear open space along Emmet Road, and thereby extending Inchicore village centre eastwards across the site as far as Richmond Barracks.

- The provision of a public open space in the eastern part of the site in front of Richmond Barracks.
- The concentration of residential development on the west side of the site (along St Vincent Street West), and in the south east corner of the site (facing Thornton Heights across Patriots Way). This would see the new larger, contemporary building typologies positioned close to the existing larger buildings on the surrounding lands.
- The provision of ‘mixed use (including community, commercial and residential)’ in the south west corner of the site opposite the school and beside the Goldenbridge Cemetery entrance and gate lodge.
- The provision of tree lined avenues along St Vincent Street West, Patriots Way and inside the southern boundary (shared with Goldenbridge Cemetery).
- The design of the buildings so that views from the buildings take advantage of the visual amenity provided by Richmond Barracks (and the new open space), Goldenbridge Cemetery, and the Grand Canal.

Figure 9.20 – DCDP 2016 map showing ‘Key Development Principles’ for SDRA 9 St Michael’s Estate



9.3.4.3 Urban Density

Objective MTO1 states: “To encourage intensification and mixed-use development along existing and planned public transport corridors and at transport nodes where sufficient public transport capacity and accessibility exists to meet the sustainable transport requirements of the development, having regard to conservation policies set out elsewhere in this plan and the need to make best use of urban land.”

Policy 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 (development standards), including the criteria and standards for good neighbourhoods, quality urban design and excellence in architecture. These sustainable densities will include due consideration for the protection of surrounding residents, households and communities”.

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”.*

9.3.4.4 Design Principles, Urban Form and Architecture

Section 16.2.1 of the DCDP states: *“In the appropriate context, imaginative contemporary architecture is encouraged, provided that it respects Dublin’s heritage and local distinctiveness and enriches its city environment. Through its design, use of materials and finishes, development will make a positive contribution to the townscape and urban realm.”*

SC25: *“To promote development which incorporates exemplary standards of high-quality, sustainable and inclusive urban design, urban form and architecture befitting the city’s environment and heritage and its diverse range of locally distinctive neighbourhoods, such that they positively contribute to the city’s built and natural environments. This relates to the design quality of general development across the city, with the aim of achieving excellence in the ordinary, and which includes the creation of new landmarks and public spaces where appropriate.”*

SC26: *“To promote and facilitate innovation in architectural design to produce contemporary buildings which contribute to the city’s acknowledged culture of enterprise and innovation...”*

9.3.4.5 Public Realm

QH10: *“To support the creation of a permeable, connected and well-linked city and discourage gated residential developments as they exclude and divide established communities.”*

SC3: *“To develop a sustainable network of safe, clean, attractive pedestrian routes, lanes and cycleways in order to make the city more coherent and navigable.”*

SC20: *“To promote the development of high quality streets and public spaces which are accessible and inclusive, and which deliver vibrant, attractive, accessible and safe places and meet the needs of the city’s diverse communities.”*

Section 4.5.5: *“A high-quality public realm makes a more attractive place to live, work and visit, and provides for an improved quality of life for all. Such a public realm can have a very positive impact on Dublin’s competitiveness with other city regions internationally, both for tourism and for investment.”*

Policy 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.”*

The above policies are relevant as they promote new development (of buildings and spaces) of high design and finish quality - including innovative contemporary buildings with landmark potential and highly effective public realm - in recognition of the potential benefits of such development to the townscape.

9.3.4.6 Conservation Areas

The site is not covered by any Conservation Area (CA) or Architectural Conservation Area (ACA) designation. However, the Grand Canal corridor including Goldenbridge Cemetery to the south of the site is a CA.

Section 11.1.5.6 of the DCDP states: *“Development outside Conservation Areas can also have an impact on their setting. Where development affects the setting of a Conservation Area, an assessment of its impact on the character and appearance of the area will be required... Any development which adversely affects the setting of a Conservation Area will be refused planning permission and the City Council will encourage change which enhances the setting of Conservation Areas.”*

Policy CHC4: *“Development within or affecting a conservation area must contribute positively to its character and distinctiveness, and take opportunities to protect and enhance the character and appearance of the area and its setting, wherever possible...”*

“Enhancement opportunities may include:

1. Replacement or improvement of any building, feature or element which detracts from the character of the area or its setting
2. Re-instatement of missing architectural detail or other important features
3. Improvement of open spaces and the wider public realm, and re-instatement of historic routes and characteristic plot patterns
4. Contemporary architecture of exceptional design quality, which is in harmony with the Conservation Area
5. The repair and retention of shop- and pub-fronts of architectural interest...”

“Development will not:

1. Harm buildings, spaces, original street patterns or other features which contribute positively to the special interest of the Conservation Area
2. Involve the loss of traditional, historic or important building forms, features, and detailing including roof-scapes, shop-fronts, doors, windows and other decorative detail
3. Introduce design details and materials, such as uPVC, aluminium and inappropriately designed or dimensioned timber windows and doors
4. Harm the setting of a Conservation Area
5. Constitute a visually obtrusive or dominant form.”

While the policy on CAs and ACAs is generally to preserve the existing/historic character, the policy allows for new buildings of contemporary architecture if (a) the site currently detracts from the ACA/CA or its setting, (b) the development takes account of and responds to its sensitive setting, and (c) the building is of exceptional design quality and in harmony with its setting. It is recognised that such buildings can have a positive effect on their historic setting.

9.3.4.7 Building Height

Section 16.7.2 of the Development Plan sets out 3 no. height category limits for the city, Low -rise, Mid- rise and High Rise. The site is located in the outer city (as per Map K of the City Plan), and within a ‘Rail Hub19’ area, being within 200m-500m of the Drimnagh Luas stop (to the south of the subject lands. Heights of up to 24m are allowable in this category (subject to other design standards). The proposed development includes a range of heights from 3 storeys to 7 storeys which is below the 24m height limit.

9.3.5 Relevant Planning Policy – Draft Dublin City Development Plan 2022-2028

Since – due to the timing of the planning application - the proposed development will likely be assessed against the Dublin City Development Plan 2022-2028 (currently in draft form), the key policies of the Draft DCDP 2022 are identified below, including the policy on SDRA 9 Emmet Road.

9.3.5.1 Approach to the Inner Suburbs and Outer City as Part of the Metropolitan Area

Inchicore is identified in Chapter 7 of the Draft DCDP 2017 as an ‘Urban Village’. In chapter 4 it is stated: “Over the next plan period, the strategic approach is also to strengthen the hierarchy of urban villages in the inner suburbs and outer city and consolidate and develop them as key focal points for the communities that they serve. The urban centres can provide opportunities for good urban placemaking, are centres for local services and form a basis for sustainable city living.”

9.3.5.2 Urban Density

The Draft DCDP 2022 states: “*The NPF recognises that there is a need to increase densities on underutilised lands within core urban areas in order to promote consolidation and compact growth, prevent further sprawl and address the challenges of climate change...*”

“The RSES and Dublin MASP also promotes greater densification and more intensive forms of development particularly on infill, brownfield and underutilised lands along key strategic public transport corridors...”

- ¹⁹ Rail hubs are within 500 m of existing and proposed Luas, mainline, DART, DART Underground and Metro stations.

“It is acknowledged that good quality, higher density developments can make a positive contribution to the evolving urban form and structure of the city and can help to achieve sustainable land use and movement patterns...”

“Increasing density can however, bring challenges in terms of ensuring appropriate levels of amenity for existing and future residents and integrating higher density schemes successfully with the existing built fabric.”

“The objective is to provide opportunities for increased density in a sustainable manner whilst ensuring the highest standards of design as well as the protection of existing amenities and the natural and historical assets of the city. There will be continued consolidation of the city to optimise the efficient use of urban land. Higher densities will be promoted in the city centre, within KUVs, certain SDRAs and within the catchment of high capacity public transport.”

Policy SC 11 on Compact Growth states:

“In alignment with the Metropolitan Area Strategic Plan, to promote compact growth and sustainable densities through the consolidation and intensification of infill and brownfield lands, particularly on public transport corridors, which will:

- enhance the urban form and spatial structure of the city;*
- be appropriate to their context and respect the established character of the area;*
- include due consideration of the protection of surrounding communities and provide for enhanced amenities for existing and future residents;*
- be supported by a full range of social and community infrastructure such as schools, shops and recreational areas;*
- and have regard to the criteria set out in Chapter 15: Development Standards, including the criteria and standards for good neighbourhoods, quality urban design and excellence in architecture.”*

The proposed development is intended to expand, consolidate and strengthen the Inchicore urban village core by infilling an area of underutilised land, which is served by strategic public transport corridors. The proposal seeks to use higher density building typologies, with considered variations in height, to enhance the urban form and spatial structure of the area (e.g. by the built frontage to Emmet Road, St Vincent Street West and Patriot’s Path).

9.3.5.3 Public Realm and Green Infrastructure

Policy CCUV 38 on High Quality Streets and Spaces states:

“To promote the development of high-quality streets and public spaces which are accessible and inclusive in accordance with the principles of universal design, and which deliver vibrant, attractive, accessible and safe places and meet the needs of the city’s diverse communities regardless of age, ability, disability or gender.”

Policy CCUV 39 on Permeable, Legible and Connected Public Realm states:

“To deliver a permeable, legible and connected public realm that contributes to the delivery of other key objectives of this development plan namely active travel and sustainable movement, quality urban design, healthy placemaking and green infrastructure.”

Policy CCUV 43 on New Development states:

“That development proposals should deliver a high quality public realm which is well designed, clutter-free, with use of high quality and durable materials and green infrastructure. New development should create linkages and connections and improve accessibility.”

Policy SC 13 on Green Infrastructure states:

“To recognise and promote Green Infrastructure and landscape as a key mechanism to address climate change and as an integral part of the form and structure of the city, including streets and public spaces”.

The proposal also seeks to introduce new public realm and Green Infrastructure, in the form of three public open spaces, new streets across the site, and improved/greened streetscapes along the site frontage, to enhance the urban structure and amenities and improve the site’s delivery of ecosystem services.

9.3.5.4 SDR4 9 Emmet Road – Guiding Principles

The most notable/relevant ‘guiding principles’ stated in the Draft DCDP 2022 for SDR4 9 (from the perspective of this townscape and visual impact assessment) are as follows:

Urban Structure

- *“To encourage development that reinforces the village cores of Inchicore and Kilmainham, connected by Emmet Road, as the central spine of the area.*
- *To seek to provide interventions that contribute a finer grain to the urban structure of the wider area, especially on former industrial and institutional lands.*
- *To recognise and enhance the role that cultural and historic buildings play in the identity and legibility of the wider area.*

Land Use & Activity

- *“To deliver a new civic and community hub as part of the redevelopment of the Emmet Road Regeneration Site.*
- *To facilitate the reconfiguration/consolidation of educational uses in the Emmet Crescent area.*
- *To capitalise on the presence of Richmond Barracks and Goldenbridge Cemetery within the Inchicore area and to facilitate the creation of linkages to other nearby historic and cultural uses.*

Height & Design

- *To support heights of 6-8 storeys for new developments in the SDR4 area where conservation and design considerations permit. Opportunities for locally higher buildings above this height are identified in the accompanying Guiding Principles Map.*
- *To ensure that new buildings respond to the scale and grain of the prevailing character of the particular street.*
- *To create a civic plaza at the Emmet Road end of the redeveloped Emmet Road Regeneration Site.*
- *New apartment buildings to generally have own-door access for all dwellings at ground floor level to contribute to increased vitality and activation of the area.*

Green Infrastructure

- *To better integrate the Grand Canal with the wider Kilmainham-Inchicore area.*
- *To create a linked network of greening corridors including walkways, biodiversity corridors, cycleways and parks, as identified in the Guiding Principles Map. These should be attractive, welcoming and accessible, feed into a wider network and connect up to the local schools in the area.*
- *To ensure that the public open space provision of development sites be sited at locations that are visible, accessible and inviting to the wider public.*

Movement

- *To facilitate the delivery of the permeability interventions identified in the Guiding Principles Map, which seek to improve accessibility throughout the area.*
- *To improve connectivity north-south across the Grand Canal/Davitt Road and east-west between Goldenbridge Industrial Estate and the Emmet Road Regeneration Site.*
- *To encourage development that enhances the vitality of the emerging network of walking and cycling infrastructure.”*

The specific guidance relating to the application site is as follows, and as illustrated on the Guiding Principles Map (Figure 9.21 below):

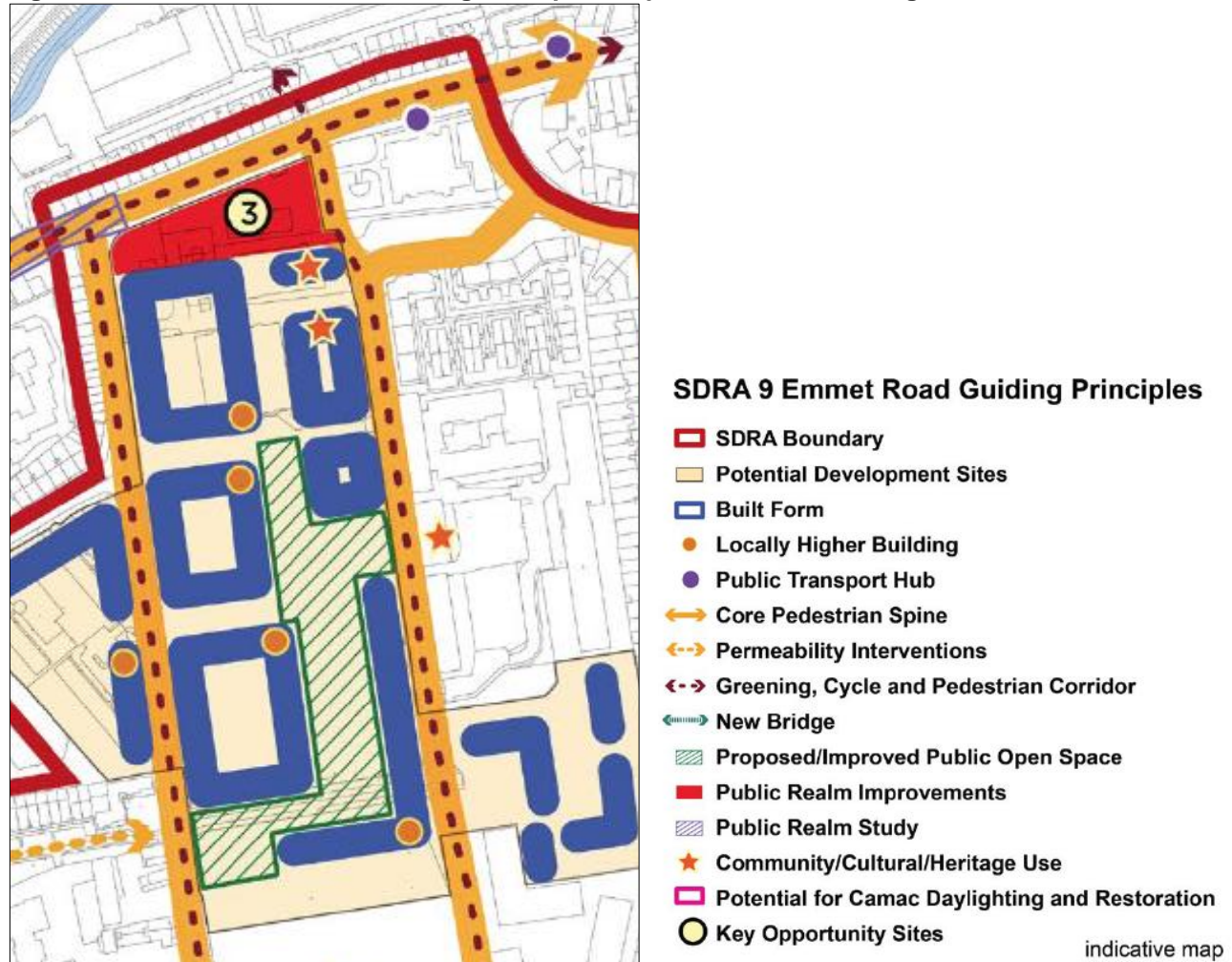
“This site is located at the heart of the SDR4 area. It is proposed to be redeveloped as a mixed use scheme which, as well as being Dublin City Council’s first cost rental residential development, will accommodate a mix of community uses, including a new community centre and library...”

“Commercial units, including a supermarket should be located at the northern end of the site, fronting onto a civic plaza along Emmet Road...”

“The site’s redevelopment will serve to tie together the wider SDRA area...”

“In relation to heights, the Emmet Road site is considered capable of delivering a new baseline height of 8 storeys with locally higher buildings in specified locations as detailed in the Guiding Principles Map, Figure 13.9, subject to detailed design and to compliance with Appendix 3 of the development plan...”

Figure 9.21 – Draft DCDP 2022 Guiding Principles Map for Emmet Road Regeneration Site



9.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development is described in detail in Chapter 2 of the EIAR, and in the drawings and architectural and landscape design statements submitted with the planning application. The development will comprise 578 no. apartments, consisting of 110 no. studio apartments, 172 no. 1 bedroom apartments, 250 no. 2 bedroom apartments (including 10 no. duplex apartments) and 46 no. 3 bedroom apartments (all apartments to have balconies or terraces), Library/Community Hub, Creche, Supermarket, 5 no. units (retail/café/restaurant/class 2 financial services floorspace) & 2 no. Café/restaurant units), a public plaza fronting onto Emmet Road and the installation of a new watermain c 200m in length along Emmet Road to the junction with Tyrconnell Road/Grattan Crescent. The proposal includes works to a protected structure (8705 - Richmond/Keogh Barracks, relating to works to rubble stone boundary wall). Further description relevant to this assessment is provided in Section 9.5.2.2 ‘Magnitude of Townscape Change’ below.

The related Part 8 demolition of the structures in the northern part of the site (permitted under 2221/21) also form part of the characteristics of the development for the purposes of the EIAR.

9.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

9.5.1 Construction Phase

The proposed development is expected to be constructed over a 36-48 month period. The construction process would entail the following:

- Set up site perimeter hoarding;
- Demolition, Excavation, and site preparation;
- Site services installations;
- Construction of new buildings frames and envelopes;
- Interior fit-out of buildings;
- Exterior streetscape, hard and soft landscaping and site boundary works.

During construction the site and immediate environs would be heavily disturbed by the above activities and the incremental growth of the buildings on site. Construction is an inherently unsightly process and there is limited potential for mitigation of the negative townscape and visual effects – apart from site hoarding to screen ground level activity, and best practice site management.

The magnitude of change to the townscape and views would be high in the immediate environs of the site (the adjacent streets/public realm and properties/ developments adjoining or facing the site across the streets). The magnitude of change would reduce with distance from the site.

Some of the affected townscape and visual receptors, e.g. the residential properties facing the site, the Richmond Barracks buildings and St Michael's Church, are of high sensitivity to townscape/visual change.

Measuring the magnitude of change against the sensitivity of the receptors, the townscape and visual effects during construction would be of moderate significance and negative in the immediate environs of the site, reducing in significance with distance from the site. This classification of the effects takes into account (a) that the construction process is temporary to short term, and (b) construction is not unusual in the urban area; it is a necessary and expected part of the urban environment.

9.5.2 Operation Phase – Townscape Effects

9.5.2.1 Townscape Sensitivity

Taking account of the existing townscape character (see Section 9.3) and relevant policy, the sensitivity of the receiving environment to townscape change can be classified medium (definition: 'Areas where the townscape has certain valued elements, features or characteristics but where the character is mixed or not particularly strong, or has evidence of alteration, degradation or erosion of elements and characteristics. The townscape character is such that there is some capacity for change. These areas may be recognised in policy at local or county level and the principle management objective may be to consolidate townscape character or facilitate appropriate, necessary change').

Key considerations in the classification of townscape sensitivity include the following:

- The site is temporarily in a vacant/unused condition, the St Michael's estate (a complex of apartment buildings) having been demolished to facilitate the site's regeneration. The site is zoned Z14 and designated a Strategic Development and Regeneration Area in the DCDP 2016. The zoning and SDRA designation are retained in the Draft DCDP 2022.
- In its current condition the site is a significant detractor from the receiving environment's townscape character and visual amenity. It lacks urban grain, streetscape and open space enclosure, an appropriate mix of uses for the urban location, buildings of architectural value, definition of public, communal and private space, and green infrastructure. In its current condition the site represents an unsustainable use of urban land and resources/ services (e.g. public transport). The receiving environment could benefit from the site's redevelopment.
- There are some sensitivities in the area, notably the residential properties facing the site across the surrounding streets, the Richmond Barracks buildings (protected structures), St Michael's Church (protected structure), Goldenbridge Cemetery and the Grand Canal (both covered by Conservation Area designation).

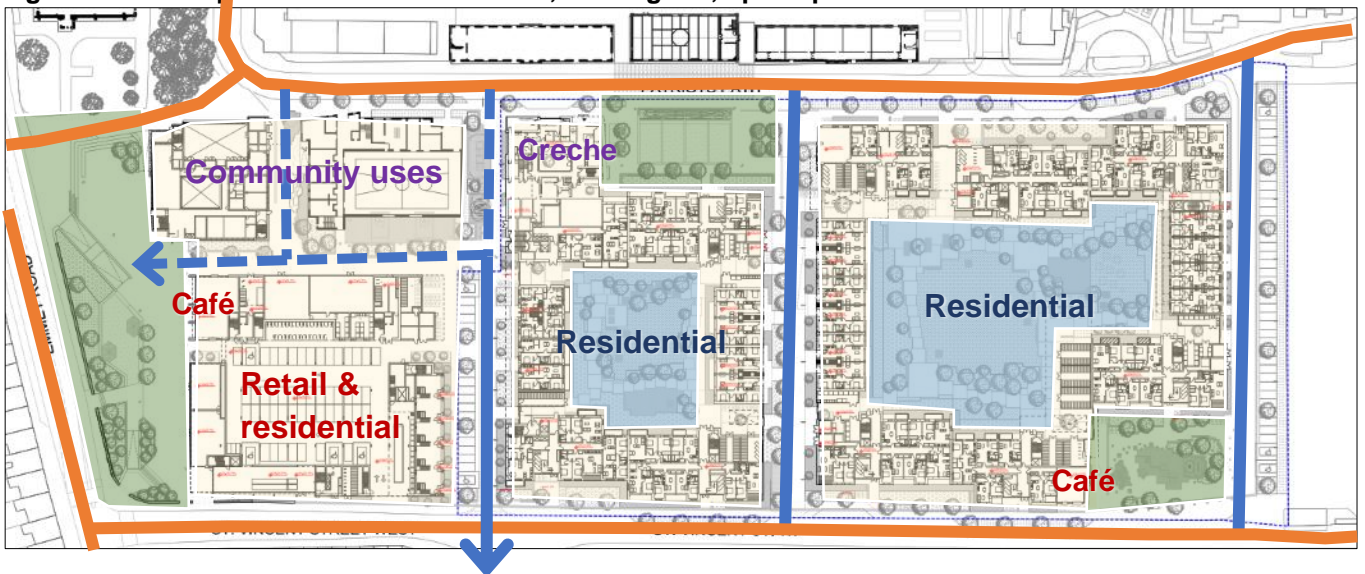
While sensitive to inappropriate change, these townscape assets could also benefit from improvement to their contexts.

9.5.2.2 Magnitude of Townscape Change

The key changes to the main elements/determinants of townscape character can be summarised as follows:

- **Land use mix:** The proposed development comprises a mix of uses including retail, café, community and residential elements, as well as public open space.
 - The **retail units** include a neighbourhood shop/supermarket and four smaller retail units. These are located in a block in the northern part of the site fronting the new linear public open space alongside Emmet Road. The retail frontage wraps around the sides of the building so that there is also active frontage to a stretch of St Vincent’s Road West, and to a new pedestrian street entering the site perpendicular to Emmet Road between the retail/mixed use element and the proposed Community Hub and existing sports centre.
 - A new **community hub and library** is proposed in the north east corner of the site, replacing the existing community building, adjacent to St Michael’s Church.
 - A **creche** is proposed fronting Patriot’s Path beside a new plaza space opposite Richmond Barracks.

Figure 9.22 – Proposed distribution of uses, urban grain, open space and routes of movement



The location/arrangement of the retail and community elements of the development would (a) expand Inchicore village centre along Emmet Road and across the northern part of the site as far as Richmond Barracks, and (b) activate the new public realm (Emmet Place and internal streets) co-located with these uses. This is in accordance with the DCDP 2016’s Key development Principles for SDRA 9 (see Section 9.3.4.2 and Figure 9.20 above).

- The **residential element** of the proposal is dispersed across the site, including above the retail centre and in two perimeter blocks of apartments occupying southern body of the site. There are 578 no. dwellings in total at a density of 155 units per hectare. The proposed density reflects the favourable location of the site with regard to Inchicore village centre, its access to public transport (Luas and bus services), the site’s previous use for high density (albeit low site coverage) residential development and the relative lack of constraints to buildings of scale on the site.
- **Urban grain and movement patterns:** The proposed development would establish a new urban grain across the site, comprised of four blocks defined/separated by vehicular and/or pedestrian streets. Three of these are aligned east-west, creating connections across the site between St Vincent Street West and Patriot’s Path. One is aligned north-south, creating a connection between the site and Emmet Road (with a spur connecting to Patriot’s Path). The orthogonal grain is determined largely by the rectangular chape of the site, which derives from Richmond Barracks of which the site was formerly a part. The grain and the alignment of the streets is also influenced by the specific requirement of the DCDP 2016 (and the Draft DCDP

2022) for east-west connections across the site. It caters for a wide range of potential desire lines, with links to all the existing surrounding streets.

- **Plot and building typologies, scale and architecture:** The proposed development comprises four building types (i.e. mixed retail and residential, the community hub/library, the creche and the residential buildings), each of distinct architectural character:
 - The **mixed use building** has a vertical split of uses, with retail and a café on the ground floor and first floor, and three/four levels of residential use above the retail. The retail frontage wraps around three sides of the building (north, west and east), to activate the public realm on all three sides. The retail base and the residential levels above are clearly differentiated in the façade treatment. The retail levels are characterised by large windows in an anodized aluminium curtain wall, and the residential façade is of light coloured brick with a rhythmic grid of fenestration. The balconies are recessed to give the building a clean profile. At the north west corner, where the site interfaces with the existing village centre there is some articulation of the form to mark the arrival point from the village centre (Figure 9.22).
 - The **Community Hub and Library** has a distinctly civic architectural character (Figure 9.23) that clearly sets it apart from the other proposed buildings. It is four storeys with a recessed ground floor so that the upper volume overhangs the public realm. The façade is predominantly glazed, with a very light-weight, patterned frame clad in stone. The design of the building, and its prominent position – projecting slightly into Emmet Place (see below), close to St Michael’s Church – would combine to create a new civic landmark in the expanded village centre.
 - The **creche**, a detached, two storey building opposite the Richmond Barracks buildings, is similarly of contemporary, civic architectural character (Figure 9.24). It has an asymmetric pattern of large windows in a façade also featuring large expanses of wall. The architecture is visibly in dialogue with the neighbouring existing sports centre, and clearly distinct from the residential buildings.

Figure 9.23 – The frontage of the proposed mixed use building to Emmet Road and St Vincent Street West



Figure 9.24 – The combined frontage of the community hub/library and the mixed use building to Emmet Road, showing the civic character of the community building



- The **residential buildings** range from five to seven storeys in height, with variations responding to the immediate context (e.g. an open space or junction of streets requiring emphasis through height, or a low existing building requiring the avoidance of dominance). The perimeter block typology means that the buildings have long facades addressing the external and internal streets. To avoid monotony the buildings are divided into distinct volumes, with the volumes offset from each other, articulating the built form. There are also variations in façade treatment and materials between the different volumes, again for the avoidance of monotony and to generate local identity and legibility. The predominant cladding materials of the residential buildings is brick, and the colours include buff, red and grey.

Figure 9.25 – The proposed creche building opposite Richmond Barracks



(against a backdrop of the residential buildings, with the existing sports centre to the right)

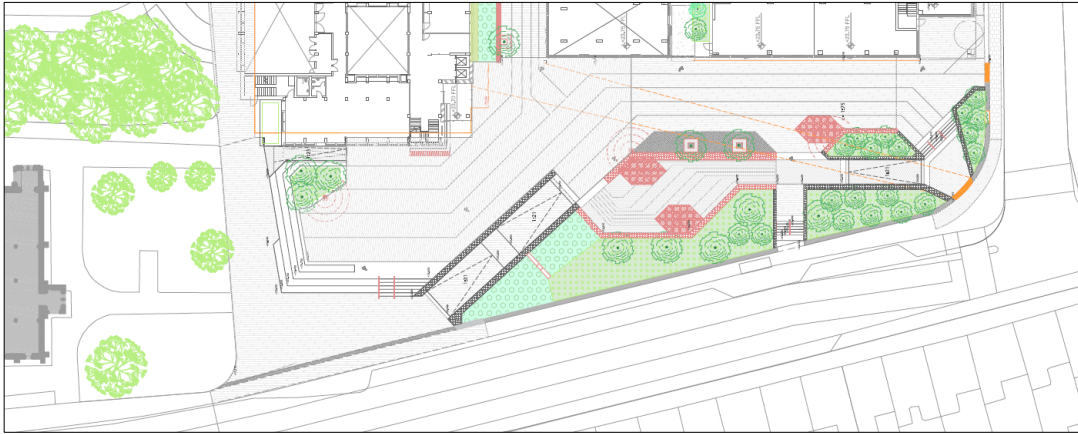
Figure 9.26 – The residential buildings fronting St Vincent Street West.

The seven storey building in the foreground marks the proposed new 'Goldenbridge Place' outside the cemetery entrance (to the right)

- **Public realm, communal open space and green infrastructure:** The proposed development includes three new public open spaces, communal open spaces, internal streetscapes and external streetscape improvements.
 - A large plaza space, '**Emmet Place**²⁰' (Figure 9.27), is proposed in the northern part of the site, alongside Emmet Road and the garden of St Michael's Church. This space incorporates a soft-surfaced, planted garden area beside the road, stairs, ramps and terraces (forming seating areas) to accommodate the change in level between the road and the site, a small play area and extensive hard-surfaced plaza spaces. These spaces are fronted by the proposed retail uses, a café and the community hub/library, generating activity and providing passive surveillance. The size of the overall space is generous, allowing for outdoor seating, play and gathering/performance. It also includes a significant area of soft surface and planting for surface water management, habitat provision and greening. The space is positioned and shaped so as to 'borrow' the neighbouring St Michael's Church building and garden – to add scale, maturity and character to the space, to the benefit of both the church and the new public space.

²⁰ Names of open space areas for illustration and will be determined as part of consultation in due course.

Figure 9.27 – Proposed Emmet Place



- Another plaza space, ‘**Richmond Place**’ (Figure 9.28), is proposed inside the east boundary, opposite the central/ principal Richmond Barracks building across Patriot’s Path. The rectangular space is formed by a setback of the residential building C1/C2 from Patriot’s Path and the forward projection of the creche building. Richmond Place is thus situated on Patriot’s Path, adjacent to the creche and the Culture Connects programme in Richmond Barracks, and the space would be activated by these community uses. It is a plaza-type space comprised of granite paving surrounding a central square of self-binding gravel, enclosed by rows of trees. There is also a small linear rain garden parallel to the road, for additional greening and ecosystem services.

Figure 9.28 & 9.29 – Proposed Richmond Place and Goldenbridge Place



- A third public open space, ‘**Goldenbridge Place**’ (Figure 9.29), is proposed in the south west corner of the site, adjacent to Goldenbridge Cemetery, at the arrival point (to the site) of St Vincent Street West from the Grand Canal and the Luas stop. The space is formed/enclosed on one side by the cemetery and on two sides by the proposed residential buildings A5 and A5. There are community uses (school and creche) diagonally across St Vincent Street West from the space, and the design reflects this context. The space is largely dedicated to a central play area (framed by trees) and the design is less formal (than the proposed Richmond Place for example). The positioning of Goldenbridge Place allows it to ‘borrow’ space and greenery from the adjacent cemetery, giving it a feeling of scale and maturity – while also respecting a small gate lodge in the corner of the cemetery. A café is proposed in the ground floor of A6, fronting the space, for activation and passive surveillance of the play area.
- The two perimeter blocks of apartments both enclose large internal courtyards, providing **communal open space** for the residents. Each of the generously scaled courtyards has a central green (for play and passive recreation) surrounded by a framework of trees, seating areas, paths catering for all desire lines, and planting in front of the buildings for privacy of the ground floor apartments.
- The surfacing of **the internal streets** varies depending on whether they carry vehicular traffic or cycle and pedestrian traffic only. The streets carrying vehicular traffic would be surfaced in exposed aggregate

in-situ concrete. This would visibly extend the road network through the site, emphasising the new urban grain and contributing to its integration with the surrounding townscape. For differentiation the pedestrian streets would be surfaced in silver/beige granite setts. All of the streets feature avenues of trees in roadside beds or positioned between parking spaces (to break up expanses of parking). Where the streets pass along residential buildings, strips of privacy planting are proposed for the ground floor apartments.

- Along the site interface with **St Vincent Street West and Patriot's Path** lines of street trees are proposed for additional greening of the townscape. The proposed landscape masterplan shows that overall the development would result in a significant increase in tree cover in the townscape, in the public realm and the communal open spaces. It is also proposed that a substantial proportion of the roof space would be green roofed to provide additional ecosystem services.
- **Perceptual factors:** The drawings, CGIs and photomontages show the proposed development – its layout, buildings and public realm - to be of high design and material quality and appreciably responsive to the context including the cultural heritage assets/sensitivities Richmond Barracks, St Michael's Church and Goldenbridge Cemetery. For example each of the surrounding streets, Emmet Road, St Vincent Street West and Patriot's Path, would benefit from (a) the addition of a new public open space strategically positioned beside the street's main heritage asset and/or an existing open space, (b) improved definition/built enclosure by buildings of design and material quality and (c) the addition of street trees. The arrangement of uses across the site, specifically the retail and community uses, would have the very significant effect of expanding and strengthening Inchicore village centre along Emmet Road, as envisaged by the DCDP 2016 (and the Draft DCDP 2022). Importantly, the mix of uses would be visibly reflected in the architecture, which varies across the site, from the town centre-type mixed use building to the community hub/library of distinctly civic character, and the residential blocks. A key outcome of the development would be the heightened level of activity, particularly pedestrian traffic, in the townscape, enlivening an area that has been 'dead space' since the demolition of St Michael's estate. Overall, the development would significantly strengthen and enhance the urban character of the townscape, and elevate its quality, benefitting the site's immediate environs and the wider Inchicore area.

Overall, the proposed development would result in a high magnitude of townscape change (definition: '*Change that is moderate to large in extent, resulting in major alteration to key elements, features or characteristics of the townscape, and/or introduction of large elements considered uncharacteristic in the context. Such development results in change to the character of the townscape*').

9.5.2.3 Significance of Townscape Effects

Measuring the magnitude of townscape change (high – see 9.5.2) against the sensitivity of the receiving environment (medium – see 9.5.1), the potential townscape effects can be classified 'significant'.

As outlined in Section 9.5.2 above, the proposed development would have positive effects on all the main elements of the townscape/determinants of townscape character, including (a) the land use mix, (b) the urban grain and movement patterns, (c) the mix of plot and building typologies and architecture, (d) the network of public and communal open spaces and green infrastructure, and (e) the overall perception of quality and liveliness of the townscape.

In summary, the townscape effects of the proposed development in the operational phase are predicted to be 'significant positive'. These effects would be long term to permanent.

9.5.3 Operational Phase – Visual Effects

29 no. representative viewpoints (see Figure 9.30 overleaf) were selected for detailed visual effects assessment informed by verified photomontages.

The viewpoints were selected to represent the key elements, character areas and groups of visual receptors in the receiving environment, as identified in Section 9.3.1 – 9.3.3 above. The selection also sought to ensure that all elements of the proposal are illustrated in the photomontages, and that views from a wide range of angles and distances are provided.

Figure 9.30 – Viewpoints for visual effects assessment



The assessment of the views below should be read in conjunction with the verified photomontages provided under separate cover.

For the methodology and the criteria and terms used in the assessment, refer to Section 9.2.3.

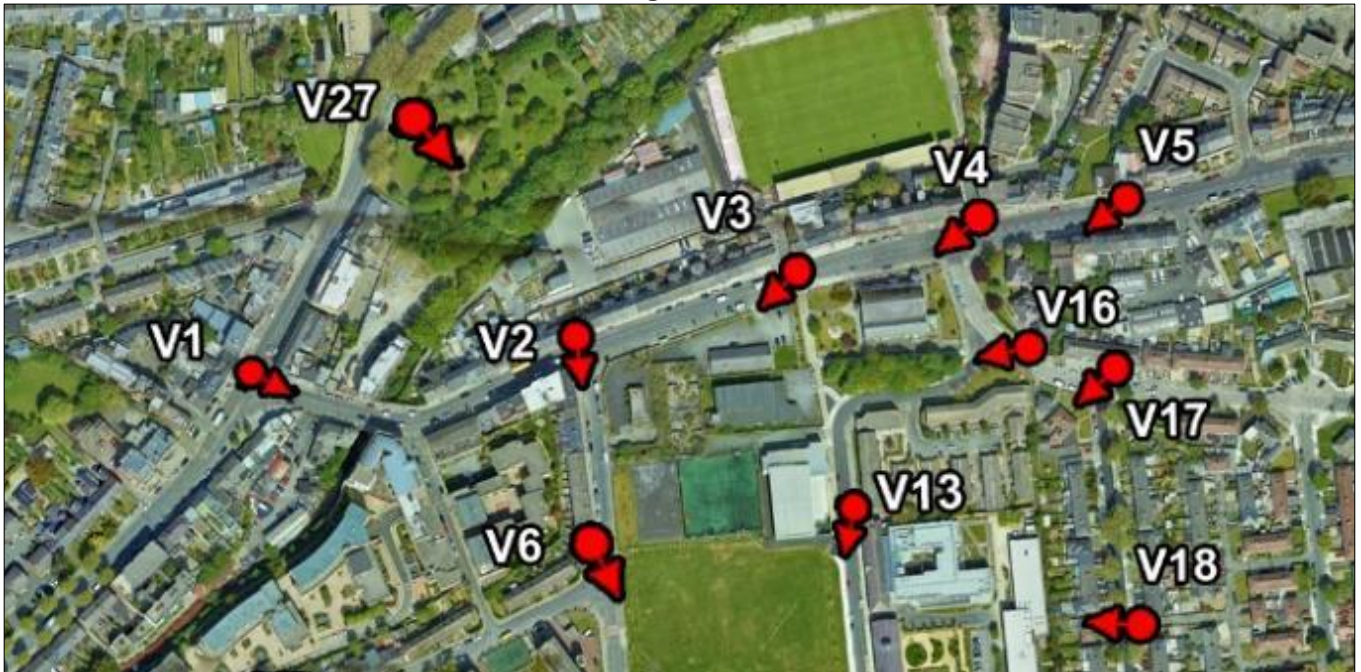
9.5.3.1 Viewpoint 1 – Junction of Emmet Road and Tyrconnell Road, Inchicore Village Centre

Baseline View: The junction is surrounded by small 19th and 20th century buildings forming an underwhelming urban/village centre. In the middle distance along Emmet Road a modern mixed use building (retail at street level with four storeys of residential above) can be seen and this has initiated a change in townscape character – modernising and urbanising the building stock, and extending the centre eastwards along Emmet Road. Another apartment building can be seen in the distance protruding above the streetfront shops. Unfortunately only its parapet is visible, so it can't be identified and it makes no positive contribution to the composition. There is considerable capacity for change/improvement to the view, and no particular sensitivities. Viewpoint sensitivity: Low-Medium.

Proposed View: The mixed use building and Block C4 would be visible above the distant roofline, framed by the foreground buildings. The new internal street separating the buildings is fortuitously positioned in the view. This adds articulation to the new built form, and there is a discernible change in architecture across the street/gap. The buildings are tall enough – and therefore protrude sufficiently - that they would be identifiable from this position, but are not so tall that they appear over-scaled in the context. Magnitude of change: Low-Medium.

Significance and Quality of Visual Effects: Moderate positive. The development would contribute positively to the ongoing change in character - and spatial extent - of Inchicore village centre, by extending the contemporary centre eastwards along Emmet Road. Legibility would thus be improved. Additionally, the introduction of buildings of appreciable quality to the townscape would elevate the quality of the building stock in view, improving visual amenity overall.

Figure 9.31 – Viewpoints focussed on the northern part of the site where the proposed development interfaces with Emmet Road and the Inchicore village centre/urban core



9.5.3.2 Viewpoint 2 – Junction of Emmet Road and St Vincent Street West

Baseline View: This point along Emmet Road currently marks the outer/eastern extent of the village centre. The mixed use, mixed era village centre can be seen to the right of St Vincent Street West, and to the left is the vacant site bounded by a high stone wall. Both Emmet Road and St Vincent Street West, and their junction, lack built enclosure/definition. There is a tangible weakening of the urban structure at this point due to the site’s disuse, and due to the site’s scale this is important. (It should be recalled that St Vincent Street West was originally the ‘main street’ in Inchicore, when it was the interface between Richmond Barracks and the village, but its status was downgraded through the 20th century.) There is considerable capacity for change/ improvement to the view, and no particular sensitivities. Viewpoint sensitivity: Low-Medium.

Proposed View: The mixed use building would be prominent in the corner between St Vincent Street West and Emmet Road, although set well back from Emmet Road behind the new Emmet Place open space, featuring a strip pf planting including trees alongside the road and a plaza in front of the building. The retail uses at ground and first floor and the residential use above are clearly distinguished in the façade treatment of the building, giving it a distinctly ‘town centre’ character. The built form is pleasingly articulated by a setback at the corner, and a gap in the building (to the left) avoids any sense of excessive massing. An important aspect of the proposal is the strong built enclosure/ definition of St Vincent Street West, which elevates its status in the urban structure. Magnitude of change: High.

Significance and Quality of Visual Effects: Very significant positive. The development would (a) expand Inchicore village centre eastwards along Emmet Road, cementing its role as the main street; (b) introduce a new public open space and greenery to the main street; (c) introduce buildings of design and material quality to the townscape, giving built enclosure/definition to the streets and open space, strengthening the urban structure and improving legibility; (d) generate activity, enlivening the scene. The range and importance of the impacts are such that the overall effect on this view can be classified very significant positive.

9.5.3.3 Viewpoint 3 – Emmet Road

Baseline View: To the right is a row of houses fronting the main street (as it enters the urban/village centre), mostly converted into small shops. To the left is the small community centre building, set back from the road behind off-street parking. The sports centre can be seen behind the community building. In the middle distance a pop-up element in the building beyond the St Vincent Street West junction marks the junction as a place, but there is little else in the composition that contributes to the urban structure or place-making. Overall the townscape lacks cohesion and buildings or other features of note/value. There is considerable capacity for change/ improvement to the view, and no particular sensitivities. Viewpoint sensitivity: Low-Medium.

Proposed View: The community hub/library building would be a prominent addition to the view, along with the mixed use building, both set back behind the large new Emmet Place which features a strip of planting including trees along the road (which softens the built frontage). The two buildings are of different character, the mixed use building a typical contemporary town centre typology, and the community/library building a civic landmark. Set back behind the wide open space and street, there is no sense of excessive scale/enclosure or an uncomfortable juxtaposition with the existing buildings across the road; together they form a pleasingly diverse composition with a strong urban structure. Magnitude of change: High.

Significance and Quality of Visual Effects: Very significant positive. The development would (a) expand Inchicore village centre eastwards along Emmet Road, cementing its role as the main street; (b) introduce a new public open space and greenery to the main street; (c) introduce buildings of strong identity and design and material quality to the townscape, strengthening the urban structure and character, and improving legibility; (d) generate activity, enlivening the scene. The range and importance of the impacts are such that the overall effect can be classified very significant positive.

9.5.3.4 Viewpoint 4 – Emmet Road View of St Michael’s Church

Baseline Views: The view is taken from Emmet Road approaching the site, with St Michael’s Church (protected structure) prominent in the foreground. Of note in the view is the width of the street, which gives indication of the urban location, but this is not reflected in the surrounding built form - apart from the church. As a protected structure the church is sensitive to inappropriate change in its context, but its position beside a broad thoroughfare, at the entrance to an urban/village core, creates capacity to accommodate change. Viewpoint sensitivity: Medium.

Proposed View: The community hub/library building would be visible above the roofline of the church - the extent of its protrusion (at this point along the road) sufficient that it would be identifiable. Importantly, the shape and façade design of the new building are such that the church would be clearly legible against the new backdrop. The mixed use building would be visible protruding to the side of the church, partly screened by the trees in the church garden. St Michael’s itself is a large building and Emmet Road is a wide street entering an established urban village centre. In this context the new buildings would not appear inappropriately located or over-scaled. Magnitude of change: Medium.

Significance and Quality of Visual Effects: Moderate positive. The development’s main effects would be to (a) urbanise and modernise the townscape, extending the village centre out along Emmet Road as far as St Michael’s Church, (b) thereby strengthen the urban structure, and (c) create a gateway to Inchicore comprised of two landmark institutional buildings, the church and the community hub/library. The church would remain prominent and legible, and would benefit from the general environmental improvement of its context.

9.5.3.5 Viewpoint 5 – Emmet Road Approaching Inchicore from the East

Baseline Views: The view is taken from further east along Emmet Road. The terraced red brick buildings give the street an urban character. St Michael’s Church is visible in the middle distance, and in the distance a modern apartment building which marks the St Vincent Street West junction. Viewpoint sensitivity: Medium.

Proposed View: The community/library building would protrude marginally above the roofline of the church, although screened/filtered by a foreground tree. Magnitude of change: Negligible.

Significance and Quality of Visual Effects: Not significant neutral. The viewpoint serves to illustrate the eastward extent of the proposal’s effects on townscape character and visual amenity. There would be no significant effect at this point along Emmet Road.

9.5.3.6 Viewpoint 6 – St Vincent Street West at the Junction with Thomas Davis Street West

Baseline View: The Tyrone Place apartments are to the right, positioned at an angle to the street, beside the junction. To the left is the vacant site, with the remaining, restored Richmond Barracks buildings visible beyond the broad green field (the site). In the distance to the south are the Thornton Heights apartment buildings and the mature trees in the Goldenbridge Cemetery, between the site and the Grand Canal. The open space of the site could be considered to lend visual amenity to the view. However, in its disused condition it weakens the urban structure and character – in addition to being an unsustainable use of the land. St Vincent Street West was originally the ‘main street’ in Inchicore when it lay at the interface between Richmond Barracks and the village. At that time it was lined on both

sides by continuous built frontage (refer to Figure 9.2) and would have had an urban character. Its status in the urban structure was downgraded through the 20th century, and now it barely reads as a street due to the absence of built frontage on the east side. However, it is an important pedestrian thoroughfare, linking Inchicore to the Luas. There is considerable capacity for change/ improvement to the view. Viewpoint sensitivity: Low-Medium.

Proposed View: The corner of the mixed use building is in the foreground to the left, with a new street entering/ crossing the site on the alignment of Thomas Davis Street (i.e. integrating the existing and new urban grain). The residential buildings B4, B5, A6 and A7 are arranged along the street, creating an entirely new urban streetscape, framing the view south towards the Grand Canal (and the Luas stop). There are minor steps forward or back in the building line, variations in height, and variations in façade treatment to differentiate the blocks and add diversity to the street elevation. The streetscape would be improved by street trees and animated by the heightened level of pedestrian and other traffic, including movement east-west across the site. Magnitude of change: High.

Significance and Quality of Visual Effects: Significant positive. The development would introduce a cluster of new buildings of design and material quality to the townscape, the new neighbourhood filling a conspicuous gap in the urban structure, integrating with the existing urban grain, giving built enclosure/definition to St Vincent Street West and restoring the street as a key element of the Inchicore townscape.

9.5.3.7 Viewpoint 7 –St Vincent Street West Outside the Tyrone Place Apartments

Baseline View: The view is taken from the footpath outside the Tyrone Place apartments. Across the road is the vacant site, with the restored Richmond Barracks buildings visible beyond the wide green space. The open space of the site could be considered to lend visual amenity to the view. However, in its disused condition it weakens the urban structure and gives the townscape a somewhat desolate character. St Vincent Street West was once the main street in Inchicore, when it lay at the interface between Richmond Barracks and the village. At that time it was lined on both sides by continuous built frontage (refer to Figure 9.2) and would have had an urban character. Its role/status was downgraded through the 20th century, and now it barely reads as a street due to the absence of built frontage on the east side. However, it is an important pedestrian thoroughfare, linking Inchicore to the Luas. There is capacity for change/ improvement to the view. Viewpoint sensitivity: Low-Medium.

Proposed View: Blocks B4 and A7 are prominent across the road, framing the entrance to a new pedestrian street that crosses the site, linking St Vincent Street West to Patriot's Path. Further along the St Vincent's Street towards the village centre and Emmet Road, the mixed use building can be seen. Together the buildings form a strong built frontage to St Vincent Street West, restoring its former urban character. There are steps forward and back in the building line, variations in height, and variations in façade treatment to differentiate the blocks and add visual interest to the street elevation. (This angle of view shows a glimpse of the 2-3 storey 'mews dwellings' on the new street across the site, adding further diversity.) The streetscape is enhanced by ornamental planting and street trees, and animated by the heightened level of pedestrian and other traffic. Magnitude of change: High.

Significance and Quality of Visual Effects: Significant positive. The development would fill a conspicuous gap in the urban structure with buildings of high design and material quality, defining a new urban grain and enclosing attractive, busy streetscapes – including that of St Vincent Street West, which would be restored to a street of status in the townscape.

9.5.3.8 Viewpoint 8 – Tyrone Place Apartments

Baseline View: The view is taken from the courtyard parking area between two Tyrone Place buildings positioned at an angle to St Vincent Street West. Across the road is the vacant site and beyond the wide green space are the Richmond Barracks buildings, with the Thornton Heights apartments to the right. The open space of the site could be considered to lend visual amenity to the view. However, in its disused condition it weakens the urban structure and gives the townscape a somewhat desolate character. There is capacity for change/ improvement to the view. Viewpoint sensitivity: Low-Medium.

Proposed View: Blocks B4 and A7 are prominent across the road, framing the entrance to a new pedestrian street that crosses the site, linking St Vincent Street West to Patriot's Path. (The street frames a view of the Richmond Barracks building at the far side of the site.) Block B4 is five storeys and Block A7, opposite the Tyrone Place courtyard, is seven storeys. The view shows that this height can be accommodated without excessive enclosure. Together the buildings form a strong built frontage to St Vincent Street West, restoring its former urban character. The new pedestrian street traversing the site contributes another important element to the urban structure. Along this

street there are variations in building typology/height, which add visual interest to the composition of built form. Magnitude of change: High.

Significance and Quality of Visual Effects: Significant positive. The development would (a) fill a conspicuous gap in the urban structure with buildings of high design and material quality, (b) restore St Vincent Street West to its former urban character and (c) introduce a new pedestrian street to the townscape (framing a view of Richmond Barracks across the site). In the context these changes would constitute a gain in townscape character and visual amenity.

9.5.3.9 Viewpoint 9 – Thomas Davis Street West

Baseline View: Similar to St Vincent Street, Thomas Davis Street was historically a more important element of Inchicore's urban structure, linking the riverside village and industry to Richmond Barracks. The street is now lined by buildings of diverse era, typology, scale and architecture. To the left is a 19th century terrace of artisans' cottages beside a 20th century terrace of two storey, red brick houses. To the right is a modern apartment building, which rises to seven storeys, beside the five storey Tyrone Place apartments. The diversity creates capacity to accommodate change. The notable absence of built form on the site contributes to a weakening of the urban character towards the end of the street (where Thomas Davis Street meets St Vincent Street West opposite the site). This also affects the legibility of the townscape. Viewpoint sensitivity: Low-Medium.

Proposed View: Blocks B5 and C (the mixed use building) are prominent additions at the end of the street, facing St Vincent Street West and framing a new street that crosses the site at a slight angle to Thomas Davis Street. There is a tangible gradation in the height/intensity of development along Thomas Davis Street towards the development, which by its typology, scale and quality denotes the site's status as part of the village centre/urban core. Magnitude of change: Medium.

Significance and Quality of Visual Effects: Moderate positive. The development would (a) fill a conspicuous gap in the urban structure with buildings of design and material quality (and variety, adding visual interest to the composition); (b) introduce a new street to the townscape; (c) mark the upgraded junction of Thomas Davis Street and St Vincent Street West with the new built form. In the context these changes would constitute a gain in townscape character and visual amenity.

9.5.3.10 Viewpoint 10 – Emmet Crescent

Baseline View: Emmet Crescent ends in a cul-de-sac behind/to the west of St Vincent's Convent church, which is a protected structure. This view is taken from the street in front of the church. To the right is a school and to the left a row of two storey red brick houses, with a four storey apartment block ahead at the junction with St Vincent Street West. Overall, the environmental quality of Emmet Crescent is poor. This is due in part to the street's disconnection from the wider townscape due to a somewhat disjointed urban grain (see Figure 9.31b). For an urban street it feels isolated. (The excerpt from the DCDP zoning map below shows a weakness of urban grain/structure locally.) Viewpoint sensitivity: Low-Medium.

Proposed View: Blocks A5 and A6 are prominent additions to the view, with the taller Block A5 (seven storeys) set back from St Vincent Street behind the new Goldenbridge Place (a plaza containing a playground, fronted by a café at the corner of Block A6). The plaza and café are positioned on the alignment of Emmet Crescent in order to tie the new open space and uses on the site into the existing townscape. The varying setback and height of the buildings, and design measures such as recessed balconies, add articulation to the built form. A small part of Block A7 is visible to the left above the roofline of the houses. This reinforces the built frontage to St Vincent Street West. Magnitude of change: Medium.

Significance and Quality of Visual Effects: Moderate positive. The development would (a) fill a conspicuous gap in the urban structure with buildings of appreciable design and material quality; (b) introduce a new public open space to the townscape, positioned on the axis of Emmet Crescent so that it is visible along the street; (c) introduce an active use (the café) at the junction of Emmet Crescent and St Vincent Street West, and fronting the plaza, activating the public realm. Overall, the area would benefit from a strengthening of the urban structure and a gain in environmental quality.

Figure 9.32 – a & b – Viewpoints from the area of mixed character and quality to the west of the site, where the site interfaces with St Vincent Street West



Figure 9.33 – c – A view west from the site along Emmet Crescent towards St Vincent’s Convent church, also showing the poor quality of the built frontage to St Vincent Street West opposite the site



9.5.3.11 Viewpoint 11 – St Vincent Street West at South West Corner of Site

Baseline View: This is an important view for a number of reasons: (1) it is the arrival point in Inchicore from the Grand Canal greenway and the Drimnagh Luas stop; (2) it shows the site interface with the neighbouring Goldenbridge Cemetery (a protected structure and ACA); (3) it shows the entire site frontage to St Vincent Street West. To the left of the road (out of view) are a school and a range of residential developments of limited environmental/visual quality, including apartment blocks up to five storeys (Tyrone Place). To the right is the vast open area of the site, covered in grass, with all former buildings and infrastructure removed. Beyond the site are the Thornton Heights apartments to the right, the Richmond Barracks buildings and the Inchicore Community Sports Centre. The open space of the site could be considered to lend visual amenity to the area. However, in the context, the large unused area weakens the urban structure and gives the townscape a desolate character. St Vincent Street West was once the main street in Inchicore and was lined on both sides by continuous built frontage (refer to Figure 9.2). Its role/status was downgraded through the 20th century and now it barely reads as a street. However, it is an important pedestrian thoroughfare, linking Inchicore to the Luas. There is considerable capacity for change/improvement to the view. Viewpoint sensitivity: Low-Medium.

Proposed View: In the foreground to the right is a wide corridor of space between Goldenbridge Cemetery and Block C, formed by a new tree-lined street crossing the site (with blocks of parking separated by trees) and a strip of low planting against the wall. This street provides a connection between St Vincent Street West and Patriot's Path, as required by the DCDP policy for SDRA 9 (see Figure 9.20 above). Blocks A5 and A6 together form/enclose a new public plaza (Goldenbridge Place) off St Vincent Street. The space contains a playground and a number of trees and ornamental planting areas. A café is visible at the corner of Block A6, fronting the plaza. The setback of the taller Block A5 from St Vincent Street West avoids excessive enclosure of the street. The buildings to the north fronting the street are all five storeys, and this built frontage restores its former urban character. The height strategy (five storey blocks at the street-front, with seven storey blocks set back and/or marking 'places' in the townscape) is well illustrated in this view, in which the composition of built form appears rational and pleasing. This is complemented by the well articulated building facades. The streetscape is enhanced by ornamental planting and street trees, and will be animated by the heightened level of pedestrian and other traffic. Magnitude of change: High.

Significance and Quality of Visual Effects: Significant positive. The development would fill a large gap in the townscape, introducing buildings, streetscapes and public open space all of high design and material quality. The urban structure and townscape character would be strengthened. Overall, the composition of built form, architecture, urban grain and open space in this view is pleasing, and appreciably responsive to the context.

9.5.3.12 Viewpoint 11b – St Vincent Street Approaching Goldenbridge Cemetery Caretaker's House

Baseline View: This view is from a position a short distance to the south of View 11, on St Vincent Street West outside Goldenbridge Cemetery. The viewpoint was selected to assess the effects on the caretaker's house (a protected structure) at the north west corner of the cemetery, beside the cemetery entrance. The protected structure is located in an environment of mixed character and quality, being attached to/part of the CA-designated 'garden cemetery' on the one hand but also part of the St Vincent Street West townscape corridor. This latter context is in a transitional condition pending the site's regeneration. While it is a sensitive feature of the townscape, there is some capacity for change/improvement to the protected structure's context. Viewpoint sensitivity: Medium.

Proposed View: The new public open space (Goldenbridge Place) is visible in the near corner of the site (separated from the caretaker's house and the cemetery entrance by a new road entering/crossing the site). The five storey Block A6 stands beyond the plaza, forming one side of the space and also part of a new street elevation to St Vincent Street West. There is a café at the near corner of Block A6, addressing both the plaza and the street. The row of new 5-7 storey buildings combines with the existing buildings on the west side to enclose the street and restore its former urban character. The visible elevation of Block A6 is attractive, benefitting from the generous balconies in the south façade. These also ensure passive surveillance of the adjacent public space. Magnitude of change: Medium-High.

Significance and Quality of Visual Effects: Significant positive. The development would fill a gap in the townscape, introducing buildings and public open space of high design and material quality, and improving the streetscape of St Vincent Street West. The composition of built form, architecture and spaces is pleasing, and responsive to the context. There would be no negative effect on the protected structure, only an improvement in the character and quality of its townscape context.

9.5.3.13 Viewpoint 12 – Drimnagh Luas Stop South of the Grand Canal

Baseline View: The view is taken from the footpath beside the Luas stop. The bridge over the canal is prominent in the foreground. This is positioned at the southern end of St Vincent Street West and connects Inchicore to the Luas line. Behind the bridge the trees and boundary wall of Goldenbridge Cemetery can be seen to the right of St Vincent Street. To the left, facing the canal, is a handsome former presbytery from the late 19th century. The combination of the canal, bridge, cemetery, trees and the historic building form an attractive foreground composition, fitting of the CA designation. In the middle distance, the cemetery caretaker's house (see Viewpoint 12) is visible, marking the south west corner of the site. Viewpoint sensitivity: Medium-High.

Proposed View: The row of new 5-7 storey buildings can be seen in the distance along the east side of St Vincent Street West. The buildings form a backdrop to the cemetery caretaker's cottage but due to the contrast in typologies and architecture the small historic building remains legible. Magnitude of change: Low.

Significance and Quality of Visual Effects: Slight positive. The new elevation to St Vincent Street West would have the effect of (a) defining the street as a linear space and complementing the bridge to strengthen the connection between Inchicore and the canal/Luas corridor, and (b) identifying the urban core of Inchicore in the view from the

Luas stop. There would be no negative effect on the CA, only an improvement in legibility and the addition of some visual interest.

9.5.3.14 Viewpoint 13 – Patriot’s Path – View from the North

Baseline View: This view is from the northern end of Patriot’s Path, adjacent to the Inchicore Community Sports Centre. Patriot’s Path provides another connection (in addition to St Vincent Street West, which runs parallel on the other side of the site) between Emmet Road and the Grand Canal. The sports centre is in the foreground to the right of the street and to the left is one of the restored Richmond Barracks buildings (a protected structure). Both buildings are relatively low. The vacant site occupies the middle ground of the view and in the distance are the trees of Goldenbridge Cemetery, with a cluster of buildings (apartments, school, creche and the cemetery caretaker’s house) to the right. As in the other views from the site’s immediate environs, the site in its disused, grass-covered condition may be considered to lend visual amenity to the view, but it also weakens the urban structure and townscape character. There is capacity for change. Viewpoint sensitivity: Medium.

Proposed View: Fronting the street beside the sports centre is the new creche, which is attached to the residential block B1 behind it, but is distinct in form, scale and architecture. The creche is a long, low building, with a horizontal emphasis in its design. There is a visible dialogue in the architecture between the creche and the sports centre. At the near corner of the creche is a volume clad in stone, which references the barracks building across the street. In the middle distance beyond the creche is a plaza space on the street, with the seven storey block B2 set back behind this space. Further along are Blocks A1-3, completing the street elevation. The new buildings combine with the Richmond Barracks buildings to enclose the street, generating an urban character. The variations in building line and height, the highly articulated facades, and design references to the neighbouring buildings create visual interest. The streetscape is further enhanced by ornamental planting and street trees, and will be animated by the heightened level of pedestrian and other traffic. Magnitude of change: Medium-High.

Significance and Quality of Visual Effects: Significant positive. The development would fill a gap in the townscape, introducing buildings and public open space of high design and material quality, and improving the streetscape of Patriot’s Path. The composition of built form, architecture and spaces is pleasing, and responsive to the context. There would be no negative effect on the protected structure, only an improvement in the character and quality of its townscape context.

9.5.3.15 Viewpoint 14 – Patriot’s Path Alongside Richmond Barracks

Baseline View: The Richmond Barracks buildings (all protected structures) are to the right of the street – all long, low buildings of cut stone or brick, giving Patriot’s Path an historic character. To the left across the road is the vacant site and on the far side of the wide green space are the sports centre and various residential buildings fronting St Vincent Street West. The open space of the site could be considered to lend visual amenity to the view. However, in its disused condition it weakens the urban structure, and there is capacity for change. Viewpoint sensitivity: Medium.

Proposed View: The new plaza space (‘Richmond Place’) is located opposite the central Richmond Barracks building, with the seven storey Block B2 set back behind the space. The creche building projects forward from Block B1 to form another side of the space. Although there is a strong contrast in building typology and scale between the barracks buildings and the contemporary apartment blocks, the wide spatial buffer formed by the plaza and Patriot’s Path ensures that the juxtaposition is not too pronounced. The many trees in the plaza contribute to this, as will the increased activity in the street and in the plaza during operation. The creche, and in the distance the Library building, contribute further to the architectural diversity. Magnitude of change: Medium-High.

Significance and Quality of Visual Effects: Significant positive. The development would fill a gap in the townscape, introducing buildings and public open space of high design and material quality, and improving the streetscape of Patriot’s Path. The composition of diverse built form and architecture, open space and streetscape is pleasing and visually interesting. There would be no negative effect on the protected structures.

9.5.3.16 Viewpoint 15 – Thornton Heights

Baseline View: The viewpoint represents the contemporary, mixed density Thornton Heights development, which was built on a part of the St Michael’s estate in the first phase of regeneration. One of the apartment blocks is in the foreground to the right and to the left (across a footpath leading to the Grand Canal greenway) is Goldenbridge Cemetery. The site occupies the middle ground and surrounding the vast grass-covered space are a range of buildings, among them the Richmond Barracks buildings, the Tyrone Place apartments and the community sports centre. Viewpoint sensitivity: Medium.

Proposed View: Blocks A1, A2 and A3 are prominent fronting Patriot's Path. The seven storey Block A2 is set back from the street behind a landscaped strip, and the five storey blocks, A1 and A3 to either side, step forward. Due to the combination of steps in the building line and roofline, the overall massing is reduced and there is no sense of excessive enclosure of Patriot's Path. The recessed balconies and variations in material add further articulation to the built form. The building is five storeys facing the cemetery, and is separated from the cemetery by a new street crossing the site, connecting Patriot's Path to St Vincent Street West. This avoids 'crowding' or excessive built enclosure of the historic cemetery (which is covered by CA designation). Magnitude of change: Medium.

Significance and Quality of Visual Effects: Moderate neutral. The development would fill a gap in the townscape, introducing buildings of high design and material quality, defining/enclosing the street and thereby strengthening the urban structure. The streetscape of Patriot's Path would also be enhanced. The development would cause no harm to Goldenbridge cemetery, but would 'borrow' its visual amenity for the occupants of the new building, thereby elevating its value as a green infrastructure asset.

9.5.3.17 Viewpoint 16 – Bulfin Road near St Michael's Church

Baseline View: This viewpoint was selected to assess (a) the effects on Bulfin Road, which gives access to St Michael's Estate/Patriot's Path, and (b) any effects on St Michael's church (protected structure) in views from the east. The large, low form of the church is to the right and to the left behind a row of trees is a two storey red brick terrace, part of the Bulfin Court estate. The trees on a central island hide the existing site buildings from view. The church is a sensitive feature but the setting lacks features or characteristics of value apart from the trees. There is some capacity for change. Viewpoint sensitivity: Medium.

Proposed View: The community hub and library building protrudes to the right of the belt of trees beyond the church, the upper floors projecting forward towards Emmet Road over a recessed base. At a distance of 100m its contemporary architecture is appreciable. It is beneficial that the building does not extend to form a backdrop to the church. A residential building, of clearly different architecture, can be seen on the other side of the trees. Magnitude of change: Low.

Significance and Quality of Visual Effects: Slight positive. The development would have the effect of expanding Inchicore village centre eastwards, and strengthening its character as a mixed use urban core. The two buildings would cause no harm to the protected structure, and would add elements of contemporary architecture to its context, improving the overall quality, visual interest and legibility of the townscape.

9.5.3.18 Viewpoint 17 – Bulfin Road Local Centre

Baseline View: This viewpoint was selected to assess the effects on the residential neighbourhood to the east of the site along Bulfin Road, including a small local centre where a row of houses have been converted into shops and cafes. The view is taken from the pavement in front of the shops, which are to the right in the view. To the left across the junction with Connolly Avenue are the mid-20th century two storey houses that characterise the low density residential area to the east of the site. The top of the Richmond Barracks lantern can just be discerned above the low roofline, and the St Michael's church tower is visible to the right. The combination of the houses, shops, trees and the distant church creates an attractive inner suburban scene. Viewpoint sensitivity: Medium.

Proposed View: A number of the buildings protrude marginally above low points the foreground roofline. No sensitive element or aspect of the view is affected. The main effect of the change is to indicate the presence of a higher density urban area nearby to the west. Magnitude of change: Low.

Significance and Quality of Visual Effects: Slight neutral. The extent of the buildings' protrusion in the view is not sufficient to materially affect the townscape character, visual interest or legibility. Nor would any negative effects result from the change.

Figure 9.34 – Viewpoints from east of the site, showing the interface with Patriot’s Path and Richmond Barracks, and the effects on the extensive 20th century residential area to the east



9.5.3.19 Viewpoint 18 – Connolly Avenue

Baseline View: Connolly Avenue is the nearest road to the east of the site. It forms part of the extensive 20th century residential neighbourhood that lies between Inchicore and Kilmainham, south of Emmet Road. The area has a strong townscape character owing to the uniformity of development type (two storey houses). The large number of mature trees on the streets and in the gardens contributes to a relatively high level of visual amenity. The houses on the west side of Connolly Avenue present their rear facades towards the site, and are separated from it by the Richmond Barracks complex, which includes two modern, large-footprint HSE buildings of up to three storeys. These buildings lie directly behind the Connolly Avenue houses. Viewpoint sensitivity: Medium-High.

Proposed View: Due to the separation distance and the visual enclosure generated by the houses, the development would not be visible from Connolly Avenue. Magnitude of change: None.

Significance and Quality of Visual Effects: No effect.

9.5.3.20 Viewpoint 19 – Goldenbridge Terrace, off Connolly Avenue

Baseline View: This view is taken from a position a short distance east of Connolly Avenue along Goldenbridge Terrace. Goldenbridge Terrace is so aligned that it frames a view towards the site, with the houses of Connolly Avenue closing the vista. The long, three storey HSE building behind the Connolly Avenue houses can be seen through a gap between the houses. Viewpoint sensitivity: Medium-High.

Proposed View: The development would not be visible. Magnitude of change: None.

Significance and Quality of Visual Effects: No effect.

9.5.3.21 Viewpoint 20 – Goldenbridge Avenue

Baseline View: Goldenbridge Avenue is aligned east-west, so that it frames a view towards the site. It is further east towards the centre of the low density residential area, and the added perspective increases the prospect of the development's visibility. This is illustrated by the fact that one of the Thornton Heights buildings can be seen above the roofline of the houses at the end of the street. Viewpoint sensitivity: Medium-High.

Proposed View: From this distance the Block A buildings protrude above the roofline of the Connolly Avenue houses at the end of the street. (It should be noted that the proposed building lie c.120m to the rear of the Connolly Avenue houses.) Their presence, in combination with the Thornton Heights building, changes the character of the area to the west, shifting it towards a more urban condition. Magnitude of change: Low.

Significance and Quality of Visual Effects: Slight neutral. The change in character of a separate, neighbouring area is not inappropriate in this central location in the city, and it does not reduce the amenities of the low density area to the east of the site.

It should be noted that the permitted development (Reg. Ref. 4260/19) on Site 1b St Michael's Estate, will also be visible behind the Connolly Avenue houses when constructed. That development comprises buildings up to four storeys tall, and they will be directly in front of the proposed buildings in this view, to the right of the Thornton Heights building (and approximately the same height as the Thornton Heights building).

Such changes in views are increasingly common in the central suburbs of Dublin, where compact growth policy is causing high density building typologies to be inserted into or alongside traditionally low density/low rise areas. The photograph below (Figure 9.35) is taken from Connolly Avenue, looking south towards a new development across the Grand Canal on Davitt Road, at the Goldenbridge Luas stop.

Figure 9.35 – A view from Connolly Avenue showing a new apartment development on the south side of the Grand Canal beside Goldenbridge Luas stop



9.5.3.22 Viewpoint 21 – Grand Canal Greenway Near 1st Lock/Suir Road

Baseline View: This view is taken from the Grand Canal greenway beside the 1st Lock. (Viewpoints 21-24 are all included to assess the effects on the Grand Canal CA.) The Canal is raised several meters above the surrounding lands along this stretch. This elevation affords a view over the low density residential area towards the site and Inchicore to the north west. The Luas line can be seen beside the canal to the left. The combination of the greenway and the Luas are driving the redevelopment of former industrial lands along the canal for high density residential use. This emerging townscape, in which areas of different character exist side-by-side, is shown in Figure 9.35 below. The canal corridor is a CA, but there is capacity for change in the surrounding, evolving urban area. Viewpoint sensitivity: Medium.

Figure 9.36 – A view along the Grand Canal (from a similar position to Viewpoint 21) showing the diversity of character in the evolving townscape



Proposed View: The development is visible in the distance above the roofscape of the low density suburb in the intervening area. From this angle the spatial extent of the site is revealed, and it is large enough to create its own area of townscape character. Although there is a common design theme, the variations in height and façade treatments/materials, and the articulated facades, reduce the perception of massing and avoid any perception of excessive density. Magnitude of change: Low-Medium.

Significance and Quality of Visual Effects: Slight neutral. In the panoramic view of a diverse urban area, the development is a relatively small but still important intervention. It establishes a new, identifiable character area, very different to the low density area in the foreground. Such diversity of character is not inappropriate in this location close to the centre of the metropolitan area; it adds character, visual interest and legibility to the townscape. No existing valued feature, characteristic or character area in the view is compromised by the change.

9.5.3.23 Viewpoint 22 – Grand Canal Greenway Near Goldenbridge Luas Stop

Baseline View: This view is taken from the Grand Canal greenway closer to the site, near the Goldenbridge Luas stop. This is an area of mixed and rapidly evolving townscape character. On the south side of the canal – behind the viewer – one large high density development has recently been completed (Figure 9.35) and another has been permitted on former industrial plots. The canal corridor is a CA, but in this evolving townscape there is considerable capacity for further change. Viewpoint sensitivity: Medium.

Proposed View: A number of the buildings are visible in the distance beyond the low density suburb to the east of the site/Inchicore. Magnitude of change: Low.

Significance and Quality of Visual Effects: Slight neutral. The development fits comfortably into the evolving townscape and no existing valued feature, characteristic or character area in the view is compromised by the change.

9.5.3.24 Viewpoint 23 – Davitt Road to South West of the Site

Baseline View: Similar to View 21, this viewpoint was selected to test the visibility from the Grand Canal corridor (a designated CA) from a distance, to establish whether the perspective and lack of built enclosure in the foreground would allow the development to be seen. Viewpoint sensitivity: Medium.

Proposed View: A combination of topography, trees and existing development in the intervening townscape causes the development to be hidden from view. Magnitude of change: None.

Significance and Quality of Visual Effects: No effect.

Figure 9.37 – The viewpoints to the south of the site including Nos. 12 and 21-24 which represent the Grand Canal CA



9.5.3.25 Viewpoint 24 – Goldenbridge Cemetery

Baseline View: The CA designation along the Grand Canal corridor broadens to cover Goldenbridge Cemetery, and several structures in the cemetery are protected structures. Goldenbridge is a ‘garden cemetery’, designed (in the early 19th century) not only as a burial place but also as a park. It contains a large number of mature trees and these combine with the high boundary walls and railings (originally for the purpose of preventing body snatching) to generate a high degree of visual enclosure. The cemetery is a distinct pocket of landscape character - of significant heritage value and visual amenity, but it is also characterised by enclosure/separation from its surroundings. It can thus withstand change in its context without being devalued – as it has in the past with the construction, operation and demolition of St Michael’s estate, and more recently the development of Thornton Heights, which overlooks the cemetery from the east. View 24 is taken from a position in the centre of the cemetery behind the mortuary chapel. Viewpoint sensitivity: Medium-High.

Figure 9.38 – A view along the footpath between Goldenbridge Cemetery and Thornton Heights



Proposed View: Blocks A3, A4 (both five storeys) and A5 (seven storeys) are visible through the cemetery trees. The separation of the buildings from the boundary by a new tree-lined road across the site, in combination with the trees and favourable local topography (the cemetery level is higher than the site), prevents the buildings from causing excessive enclosure. Their presence is also reduced by their highly articulated facades. It is notable that each building's façade treatment is different. Magnitude of change: Low-Medium.

Significance and Quality of Visual Effects: Moderate neutral. The cemetery is characterised by its enclosure/separation from the surrounding townscape. It generates its own parklike character and amenities. The visibility of the development would not reduce the landscape and visual amenities of the cemetery. This is ensured by the embedded mitigation of (a) maintaining a corridor of space (the tree-lined street) between the buildings and the cemetery wall, (b) limiting the height of Blocks A3 and A4 to five storeys (the same height as the Thornton Heights buildings, which are closer to the cemetery), and (c) the high design and material quality of the buildings.

In the context, the cemetery is a valuable pocket of high amenity landscape/green infrastructure. Throughout its history it has withstood change in its surroundings, maintaining its own character and amenities. Considered conversely, its presence heightens the value of the adjacent lands – including the site – as urban land use assets, particularly residential development sites. This is because those sites can 'borrow' the amenities of the cemetery for the residents. The proposed development does this, i.e. realises the amenity value of the cemetery (for Blocks A3, A4, A5 and the new plaza 'Goldenbridge Place', without encroaching too closely on its space and causing undue built enclosure.

9.5.3.26 Viewpoint 25 – Benmadigan Road South of the Grand Canal

Baseline View: Benmadigan Road encircles a large open space in Drimnagh to the south of the Grand Canal, directly to the south of the site. The open space affords an unobstructed view towards the site - allowing for the southern extent of the proposal's visual effects to be determined. There is an emerging strip of high density development on the south side of the canal and one of the new apartment buildings is visible to the right. One of the Thornton Heights buildings can also be seen through a gap between the foreground houses. Viewpoint sensitivity: Medium.

Proposed View: The development would not protrude above the foreground houses. Magnitude of change: None.

Significance and Quality of Visual Effects: No effect neutral.

9.5.3.27 Viewpoint 26 – Mary Immaculate Church, Tyrconnell Road

Baseline View: The Oblate Church of Mary Immaculate, on Tyrconnell Road 500m to the west of the site, is a protected structure. This is also one location at which a gap between buildings on the east side of the road affords a view towards the site from Tyrconnell Road - allowing for the proposal's effects on the road (an important route of entry into Dublin) to be assessed. Across the road is the entrance to an industrial zone, which limits the existing visual amenity and contributes to a high capacity for change. Viewpoint sensitivity: Low.

Proposed View: The development would be hidden by the buildings and trees in the intervening landscape. Magnitude of change: None.

Significance and Quality of Visual Effects: Imperceptible neutral.

9.5.3.28 Viewpoint 27 – Grattan Crescent Park

Baseline View: Grattan Crescent Park is one of the main public open spaces serving Inchicore. The riverside park includes a central playground, allotment gardens and a framework of trees including a belt of mature trees along the Cammock River. The vegetation restricts visibility of the surrounding townscape, but in places buildings - including existing modern apartment buildings - are visible between the trees. Viewpoint sensitivity: Medium.

Proposed View: In summer the development would be entirely screened by the trees. In winter the buildings would be discernible although heavily filtered by the bare tree canopies. Magnitude of change: Negligible.

Significance and Quality of Visual Effects: Not significant neutral. There would be no significant change to the character of the townscape or the visual amenity experienced in the park.

9.5.3.29 Viewpoint 28 – Inchicore Road and Grattan Crescent

Baseline View: A gap in the terraced houses where Inchicore Road meets Grattan Crescent affords a view south towards the site. The trees along the Cammock River can be seen in the middle distance, and Emmet Road and the site are in the distance beyond the trees. Viewpoint sensitivity: Medium.

Proposed View: The development would be hidden by the buildings and trees in the intervening landscape. Magnitude of change: None.

Significance and Quality of Visual Effects: Imperceptible neutral.

9.5.4 Potential Cumulative Impacts

There have been several late 20th and early 21st century high density residential and mixed use developments around the core of Inchicore, e.g. the Tramyard, Berry's Close and Ellen Hall developments, which have initiated a shift in character towards an urban condition in the village centre.

Permission has been granted for another such development (Reg. Ref. 2453/19, amending Reg. Ref. 3635/16) on a site north of Emmet Road to the west of the subject site, alongside the Cammock River. The permission is for a six storey apartment building. This site is 120m+ to the west of the subject site, in the existing village centre. Due to the curved alignment of the street, the topography, and existing development in the intervening townscape, there is limited potential for the two developments to be seen together – and therefore to have cumulative visual effects. There is some potential for the subject proposal to interact with this permitted development and reinforce the ongoing shift in townscape character of Inchicore. This change is not inappropriate; the eastward expansion of the village centre along Emmet Road is an objective for SDRA 9 in the DCDP 2016 and the Draft DCDP 2022.

Permission has been granted for a four storey older persons' housing scheme (Reg. Ref. 4260/19 on Site 1b St Michael's Estate) on a site directly to the east of the subject site across Patriot's Path, between Richmond Barracks and Thornton Heights. That development, like Thornton Heights and the proposed development, would occupy an area left vacant by the demolition of St Michael's Estate, filling a gap in the townscape. Due to the permitted development being somewhat removed from the wider public realm (other than from Patriot's Path) and of relatively small scale, there is no potential for a significant accumulation of townscape and visual effects in combination with the proposed development. Among the viewpoints assessed in Section 9.5.3 above, this development is only likely to be visible in Views 20 and 21. Due to its modest height it would not be prominent in either view, and its only effect would be to soften the presence of the proposed development, which would rise behind it in these views.

An application has been made for development of a small apartment building (four storeys) to form part of an existing cluster of three apartment buildings on Emmet Court, to the south west of the site facing the Grand Canal. Due to the separation distance from the subject site, and the proposed building forming part of an existing cluster of similar buildings, there is no potential for cumulative townscape and visual effects in combination with the subject proposal.

In addition to the ongoing consolidation and densification of Inchicore village centre, there is a pattern of increasing density of residential development in the wider area, facilitated by a combination of the Luas line (stops at Blackhorse, Drimnagh and Goldenbridge) and the existence of former industrial sites. Most notably, there is an emerging strip of apartment developments along Davitt Road to the south of the Grand Canal. A permission for the former Dulux factory site (ABP-303435-19) to the south west of the subject site across the Grand Canal, will contribute further to this townscape change.

The National Transport Authority has lodged an application (KA29N.314091) for the Liffey Valley to City Centre Core Bus Corridor Scheme. The decision is due in January 2023. The project would involve upgrade works to Emmet Road as part of the overall improvement of the bus connection between the city centre and Inchicore (and on to Liffey Valley). This would result in the site having immediate access (minutes' walk from all parts of the site) to a core bus corridor, a Luas line and a greenway (along the Grand Canal) for access to the city, in addition to the site forming part of the expanded urban core of Inchicore (for local retail, services, etc.).

9.5.5 'Do Nothing' Impact

In the do nothing scenario the site would remain as a large, unused area of land adjacent to Inchicore village centre, fronting the main street Emmet Road. While of some visual amenity value (to residents overlooking the site) in its

vacant, grass-covered condition, the site detracts from the receiving environment's townscape character. It is a gap which weakens the urban structure. It lacks urban grain, streetscape and open space enclosure, an appropriate mix of uses for the urban location, buildings of architectural value, definition of public, communal and private space, and green infrastructure (particularly trees).

The site is a large part of the area identified as SDRA 9 in the DCDP 2016 and Draft DCDP 2022. In the do nothing scenario the development and regeneration objectives for the site, and therefore for a key element/area of the planned townscape of Inchicore, would not be realised.

9.6 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

9.6.1 Construction Phase

No measures are recommended for townscape and visual impact mitigation other than standard best practice construction site management.

9.6.2 Operational Phase

The potential townscape and visual effects of the proposal in the operational phase have been classified as positive or neutral. No negative effects have been identified. Therefore no mitigation measures are required for townscape and visual effects.

9.6.3 'Worst-case' Scenario

The worst case scenario is not relevant to the proposed development.

9.7 PREDICTED IMPACTS (RESIDUAL IMPACTS)

Since no mitigation measures have been recommended, the predicted impacts are the same as the potential impacts identified in Section 9.5 above. These effects are summarised below.

9.7.1 Construction Phase - Townscape Effects

During construction the magnitude of townscape and visual change to the site's immediate receiving environment (the adjacent streets/public realm and properties/developments adjoining or facing the site across the streets) would be high. The magnitude of change would reduce with distance from the site. Construction is an inherently unsightly process and there is limited potential for mitigation of negative townscape and visual effects, apart from best practice site management (to keep the site as tidy as possible) and site hoarding (to screen ground level activity).

Some of the affected townscape and visual receptors, e.g. the residential properties facing the site, the Richmond Barracks buildings and St Michael's Church, are of high sensitivity to townscape change in their context.

Measuring the magnitude of change against the sensitivity of the receptors, the townscape effects during construction are predicted to be of moderate significance and negative in the immediate environs, reducing in significance with distance from the site. Mitigating factors taken into account in classifying the effects include (a) that the construction process is temporary to short term, and (b) construction is not unusual; it is a necessary and expected part of the urban environment.

9.7.2 Operation Phase – Townscape Effects

9.7.2.1 Townscape Sensitivity

Taking account of the existing townscape character (see Section 9.3) and relevant policy, the sensitivity of the receiving environment to townscape change is medium (definition: 'Areas where the townscape has certain valued elements, features or characteristics but where the character is mixed or not particularly strong, or has evidence of alteration, degradation or erosion of elements and characteristics. The townscape character is such that there is some capacity for change. These areas may be recognised in policy at local or county level and the principal management objective may be to consolidate townscape character or facilitate appropriate, necessary change').

Key considerations in the classification of townscape sensitivity include the following:

- The site is temporarily in a vacant/unused condition, the St Michael's estate (a complex of apartment buildings) having been demolished to facilitate the site's regeneration. The site is zoned Z14 and designated a Strategic Development and Regeneration Area in the DCDP 2016. The zoning and SDRA designation are retained in the Draft DCDP 2022.
- In its current condition the site is a significant detractor from the receiving environment's townscape character and visual amenity. It lacks urban grain, streetscape and open space enclosure, an appropriate mix of uses for the urban location, buildings of architectural value, definition of public, communal and private space, and green infrastructure. In its current condition the site represents an unsustainable use of urban land and resources/ services (e.g. public transport). The receiving environment could benefit from the site's redevelopment.
- There are some sensitivities in the area, notably the residential properties facing the site across the surrounding streets, the Richmond Barracks buildings (protected structures), St Michael's Church (protected structure), Goldenbridge Cemetery and the Grand Canal (both covered by Conservation Area designation). While sensitive to inappropriate change, these townscape assets could also benefit from improvement to their contexts.

9.7.2.2 Magnitude of Townscape Change

The key changes to the main elements/determinants of townscape character can be summarised as follows:

- **Land use mix:** The proposed development comprises a mix of retail, café, community and residential elements, as well as public open space. The location/arrangement of the retail and community elements would (a) expand Inchicore village centre eastwards along Emmet Road and across the northern part of the site to Richmond Barracks, and (b) activate the new public realm. The residential element is dispersed across the site, including above the retail centre and in two perimeter blocks of apartments. There are 578 no. dwellings at a density of 155 units per hectare. The density reflects the favourable location with regard to Inchicore village centre, its access to public transport (Luas and bus services), the site's previous use for apartment development, and the relative lack of constraints to buildings of scale on the site.
- **Urban grain and movement patterns:** The proposed development would establish a new urban grain across the site, comprised of four blocks defined/separated by vehicular and/or pedestrian streets. Three of these are aligned east-west, creating connections across the site between St Vincent Street West and Patriot's Path. The orthogonal grain is determined largely by the rectangular shape of the site, which derives from Richmond Barracks of which the site was formerly a part. The grain and the alignment of the streets is also influenced by the specific requirement of the DCDP 2016 (and the Draft DCDP 2022) for east-west connections across the site. It caters for a wide range of potential desire lines, with links to all the existing surrounding streets.
- **Plot and building typologies, scale and architecture:** The proposed development comprises four building types (i.e. mixed retail and residential, community hub/library, creche and residential buildings), each of distinct architectural character.
 - The mixed use building, with its vertical split of uses, has a 'town-centre' typology intended to establish the site as part of the urban/village centre. The retail frontage wraps around three sides of the block to activate the public realm.
 - The community hub/library has a distinctly civic architectural character. The design of the building and its prominent position would combine to create a new civic landmark in the expanded village centre.
 - The creche, a two storey building opposite Richmond Barracks, is similarly of contemporary, civic architectural character. There is an appreciable dialogue with the neighbouring existing sports centre, and the modest scale of the building respects the Richmond Barracks buildings.

- The residential buildings range from five to seven storeys in height, with variations responding to the immediate context. To avoid monotony and create local identity within the neighbourhood the long facades of the perimeter blocks are divided into distinct volumes, with the volumes stepping forward or back and varying in height. There are also minor variations in façade treatment and materials between the different volumes.
- **Public realm, communal open space and green infrastructure:** The proposed development includes three new public open spaces, communal open spaces, internal streetscapes and external streetscape improvements.
 - ‘Emmet Place’ in the northern part of the site alongside Emmet Road incorporates a garden area beside the road, stairs, ramps and terraces, a small play area and plaza areas fronted by the retail units, café and the community hub/library (generating activity and providing passive surveillance). The size of the overall space is generous, allowing for outdoor seating, gathering, performance and play. The space is positioned and shaped so as to ‘borrow’ the neighbouring St Michael’s Church building and garden – to add scale, maturity and character to the place.
 - ‘Richmond Place’ is located inside the east boundary opposite the principal/central Richmond Barracks building across Patriot’s Path. The space would be activated by the Culture Connects programme in Richmond Barracks and the creche and residential uses in the enclosing buildings on the site.
 - ‘Goldenbridge Place’ is located in the south west corner of the site adjacent to Goldenbridge Cemetery (so that it ‘borrows’ space and greenery from the cemetery), at the arrival point (to the site) of St Vincent Street West from the Grand Canal and the Luas stop. There are community uses (school and creche) diagonally across St Vincent Street West, and the design reflects this context, with a central play area framed by trees. A café is proposed at the ground floor of one of the buildings fronting the space, for activation and passive surveillance of the play area.
 - The two perimeter blocks of apartments both enclose large internal courtyards providing communal open space for the residents. Each of the generously scaled courtyards has a central green surrounded by a framework of trees, seating areas, paths catering for all desire lines, and planting in front of the buildings for privacy of the ground floor apartments.
 - All of the proposed internal streets feature avenues of trees in roadside beds or positioned between parking. Where the streets pass along residential buildings, strips of privacy planting are proposed for the ground floor apartments. Along the site interface with St Vincent Street West and Patriot’s Path lines of street trees are proposed for additional greening of the townscape.

The landscape masterplan shows that overall the development would result in a significant increase in tree cover in the townscape, in the public realm and the communal open spaces. It is also proposed that a substantial proportion of the roof space would be green roofed to provide additional ecosystem services.

- **Perceptual factors:** The drawings, CGIs and photomontages show the proposed development to be of high design and material quality and appreciably responsive to the context including the cultural heritage assets/sensitivities, i.e. Richmond Barracks, St Michael’s Church and Goldenbridge Cemetery. Each of the surrounding streets, Emmet Road, St Vincent Street West and Patriot’s Path, would benefit from (a) the addition of a new public open space strategically positioned beside the street’s main heritage asset and/or an existing open space, (b) improved definition/built enclosure by buildings of design and material quality and (c) the addition of street trees. The arrangement of uses across the site would have the effect of expanding and strengthening Inchicore village centre along Emmet Road - as envisaged by the DCDDP 2016 (and the Draft DCDDP 2022). The mix of uses would be visibly reflected in the architecture, which varies across the site, from the town centre-type mixed use building to the community hub/library of civic character, and the residential blocks. A key outcome of the development would be the heightened level of activity, particularly pedestrian traffic, in the townscape, enlivening an area that has been ‘dead space’ since the demolition of St Michael’s estate. Overall, the development would significantly strengthen and enhance the urban character of the townscape, and elevate its quality, benefitting the site’s immediate environs and the wider Inchicore area.

Overall, the proposed development would result in a high magnitude of townscape change (definition: ‘Change that is moderate to large in extent, resulting in major alteration to key elements, features or characteristics of the townscape, and/or introduction of large elements considered uncharacteristic in the context. Such development results in change to the character of the townscape’).

9.7.2.3 Significance of Townscape Effects

Measuring the magnitude of change against the sensitivity of the receiving environment, the potential townscape effects are predicted to be ‘significant’.

The proposed development would have positive effects on all the main elements of the townscape/ determinants of townscape character, including (a) the land use mix, (b) the urban grain and movement patterns, (c) the mix of plot and building typologies and architecture, (d) the network of public and communal open space and green infrastructure, and (e) the overall perception townscape quality. In summary, the operational phase townscape effects are predicted to be ‘significant positive’. These effects would be long term to permanent.

9.7.3 Operational Phase – Visual Effects

The predicted effects on 29 no. representative viewpoints in the receiving environment are summarised in Table 9.6 below. (For explanation of the individual viewpoint assessments refer to Sections 9.5.3.1 – 9.5.3.29.)

Table 9.6 – Summary of Visual Effects Assessment

Viewpoints	Viewpoint Sensitivity	Magnitude of Change	Significance & Quality of Visual Effects		
			Construction (Temporary)	Operation (Permanent)	Residual (Permanent)
01 – Junction of Emmet Rd & Tyrconnell Rd, Inchicore Centre	Low-medium	Low-medium	Slight negative	Moderate positive	Moderate positive
02 – Junction of Emmet Rd & St Vincent St West	Low-medium	High	Moderate negative	Very significant positive	Very significant positive
03 – Emmet Rd	Low-medium	High	Moderate negative	Very significant positive	Very significant positive
04 – Emmet Rd View of St Michael’s Church	Medium	Medium	Moderate negative	Moderate positive	Moderate positive
05 – Emmet Rd Approaching Inchicore from the East	Medium	Negligible	Not significant neutral	Not significant neutral	Not significant neutral
06 – St Vincent St West at Junction with Thomas Davis Street West	Low-medium	High	Moderate negative	Significant positive	Significant positive
07 – St Vincent St West outside Tyrone Place apartments	Low-medium	High	Moderate negative	Significant positive	Significant positive
08 – Tyrone Place apartments	Low-medium	High	Moderate negative	Significant positive	Significant positive
09 – Thomas Davis St West	Low-medium	Medium	Slight negative	Moderate positive	Moderate positive
10 – Emmet Crescent	Low-medium	Medium	Slight negative	Moderate positive	Moderate positive
11 – St Vincent St West at South West Corner of Site	Low-medium	High	Moderate negative	Significant positive	Significant positive
11b – St Vincent St West approaching cemetery house (p.s.)	Medium	Medium-High	Moderate negative	Significant positive	Significant positive

Viewpoints	Viewpoint Sensitivity	Magnitude of Change	Significance & Quality of Visual Effects		
			Construction (Temporary)	Operation (Permanent)	Residual (Permanent)
12 – Drimnagh Luas Stop south of the Grand Canal	Medium-high	Low	Slight negative	Slight positive	Slight positive
13 – Patriot’s Path – View from the North	Medium	Medium-High	Moderate negative	Significant positive	Significant positive
14 - Patriot’s Path alongside Richmond Barracks	Medium	Medium-High	Moderate negative	Significant positive	Significant positive
15 – Thornton Heights	Medium	Medium	Slight negative	Moderate neutral	Moderate neutral
16 - Bulfin Road near St Michael’s Church	Medium	Low	Slight negative	Slight positive	Slight positive
17 – Bulfin Road local centre	Medium	Low	Not significant negative	Slight neutral	Slight neutral
18 – Conolly Avenue	Medium-high	None	No effect	No effect	No effect
19 - Goldenbridge Terrace, off Connolly Avenue	Medium-high	None	No effect	No effect	No effect
20 - Goldenbridge Avenue	Medium-high	Low	Slight negative	Slight neutral	Slight neutral
21 - Grand Canal Greenway near 1st Lock/Suir Road	Medium	Low-medium	Slight negative	Slight neutral	Slight neutral
22 - Grand Canal Greenway near Goldenbridge Luas Stop	Medium	Low	Not significant negative	Slight neutral	Slight neutral
23 - Davitt Road to south west of site	Medium	None	No effect	No effect	No effect
24 – Goldenbridge Cemetery	Medium-high	Low-medium	Slight negative	Slight positive	Slight positive
25 - Benmadigan Rd South of the Grand Canal	Medium	None	No effect	No effect	No effect
26 - Mary Immaculate Church, Tyrconnell Road	Low	None	No effect	No effect	No effect
27 - Grattan Crescent Park	Medium	Negligible	Not significant neutral	Not significant neutral	Not significant neutral
28 - Inchicore Road and Grattan Crescent	Medium	None	No effect	No effect	No effect

9.8 MONITORING

No monitoring of townscape and visual effects is required other than the monitoring of soft landscape works after planting to ensure the health and viability of the plants.

9.9 REINSTATEMENT

No reinstatement works are required beyond completion of construction in accordance with the plans.

9.10 CUMULATIVE IMPACTS

No potential has been identified for significant cumulative impacts to arise from the proposed development in combination with any permitted or proposed development (refer to Section 9.5.4 above).

9.11 DIFFICULTIES ENCOUNTERED IN COMPILING

No difficulties were encountered in the preparation of the assessment.

9.12 SUMMARY

The proposed development is predicted to have only positive or neutral townscape and visual effects and can be considered an appropriate intervention in the townscape of Inchicore.

10.0 MATERIAL ASSETS - TRAFFIC AND TRANSPORTATION

10.1 INTRODUCTION

This chapter of the EIAR assesses the likely effects of the proposed development in terms of vehicular, pedestrian and cycle access during the construction and operational phases of the proposed development.

This chapter is based primarily on the Traffic Impact Assessment and Mobility Management Plan prepared by OCSC, for the development and submitted under separate cover. These assessments and reports have been prepared in accordance with the relevant guidelines including:

- Design Manual for Roads and Bridges (DMRB), February 1999;
- Design Manual for Urban Roads and Streets (DMURS), March 2013;
- Transport Infrastructure Ireland (TII) Traffic and Transport Assessment Guidelines, May 2014;
- Guidelines for Traffic Impact Assessment, Chartered Institute of Highways & Transportation 1997;
- Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections, TII October 2021;
- Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion Factors for Short Period Traffic Counts, TII October 2016;
- Dublin City Development Plan 2016-2022;
- Draft Dublin City Development Plan 2022-2028;
- Alternative Future Demand Scenario, TII July 2021
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, EPA May 2022.

10.2 METHODOLOGY

OCSC met with representatives of Dublin City Council (DCC) Transport Planning Department on numerous occasions to discuss this project and agree the scope and methodology of this assessment including dates in July 202, November 2020, December 2020 and May 2022. Key issues discussed at these meetings include:

- The scope of traffic surveys to be carried out and extent of study area;
- The mobility and parking strategy associated with the development with particular focus on the proposed car club strategy, viability, key requirements and operation;
- Accessibility, permeability and road design matters

The assessment has considered the potential impacts of the proposed development with respect to traffic and transportation. The baseline data was collected via bespoke surveys conducted on the local road network at key junctions

The survey data was combined with the Transport Infrastructure Ireland (TII) factors for expansion to future years (2024 & 2039) and annual average daily traffic. It is noted that the ongoing Covid 19 pandemic is expected to have a significant but currently unquantifiable, impact on future traffic growth for the following reasons:

- Growth factors are generally developed having regard to projections for economic growth. The global pandemic has had a significant impact in this regard which means such projections are now unlikely to be realised meaning traffic growth is expected to be similarly over-estimated;
- Restrictions imposed as a result of the pandemic response have resulted in a significant portion of the population being forced to work from home. This has highlighted the viability of this approach in industries where it was previously thought to be incompatible. The knock on effect is expected to be a continual percentage of work continuing to be from the home even after the pandemic restrictions are lifted. This in turn will have a knock on effect on commuter and peak traffic levels. TII has acknowledged this likelihood in a recently circulated note titled “*Alternative Future Demand Scenario*” dated July 2021 where it states “*COVID-19 accelerated change in terms of when people travel, how they travel and whether they travel at all*”. The note concludes that the total number of daily trips could be up to 8% lower than previous projections with the potential for approximately 20% of the workforce to potentially work from home.

As a result, the traffic growth allowed for is considered to be very conservative in nature and, particularly for the Design Year, the estimated traffic flows which form the basis of this assessment and unlikely to be realised and traffic flows in practice are expected to be lower.

The traffic generation potential of the development was then assessed using the TRICS (Trip Rate Information Computer System) planning database. This database contains information on thousands of sites in Ireland and the U.K. and can be used to predict the traffic that will be generated by numerous types of development.

The estimated additional traffic was assigned to the local road network and its impact on the operation of the local links and junctions was assessed using guidance from TII, the Chartered Institute of Highways & Transportation (CIHT), the Design Manual for Roads and Bridges (DMRB) and task specific traffic modelling software. The significance of the environmental impacts associated with the proposed development have been assessed based on the following criteria:

- Impact on number of heavy goods vehicles;
- Impact on traffic congestion locally;
- Impact on safety of vulnerable road users.

10.3 RECEIVING ENVIRONMENT

10.3.1.1 Site location

The receiving environment is urban in nature, located in Inchicore, Dublin 8. The site bounded by Emmet Road to the north, St. Vincent's Street West to the west, Patriots Path to the east and Goldenbridge Cemetery to the south. The site currently comprises of a mixture of brownfield areas which previously housed the Saint Michael's Estate development together with the current existing buildings/structures with St Michael's Parish Community Centre and Eve Tuiscint Health Centre to be demolished and Inchicore Community Sports Centre and the boundary wall to the northwest corner of the site to be retained.

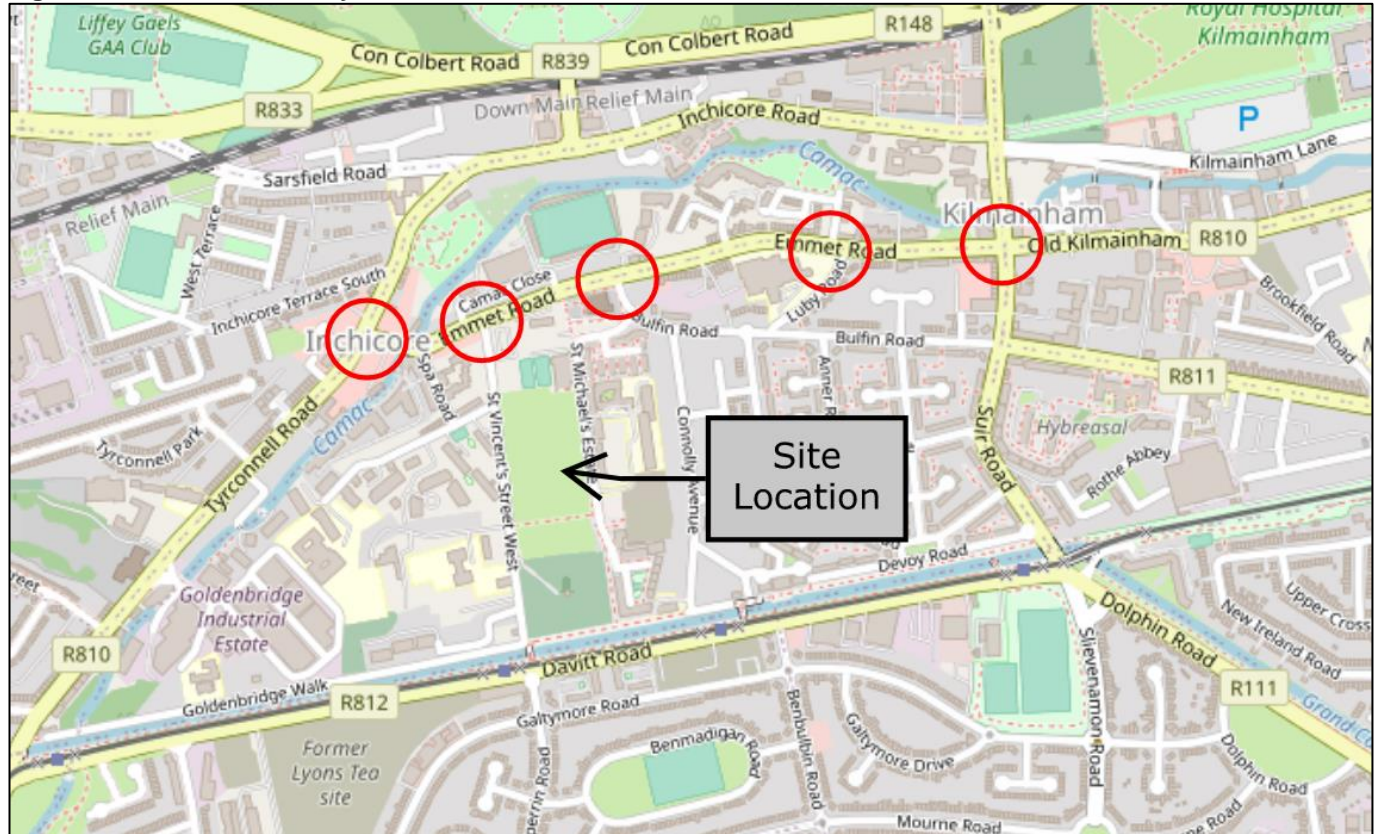
10.3.1.2 Local road network

The primary road artery in the study area is Emmet Road which includes a number of existing junctions with minor roads as well as on-street car parking. It facilitates both through traffic and bus services as well as local access. St. Vincent's Street West and St. Michael's Estate are local access routes only which also facilitate on-street parking.

10.3.1.3 Baseline traffic data

The surveys were carried out on the 28th of April 2022 between the hours of 07:00 – 19:00, a significant period of time after any restrictions associated with the recent Covid 19 pandemic had been lifted in full meaning travel patterns are considered to have settled back to normality. The exact survey locations are shown following.

Figure 10.1 – Traffic Survey Locations



The surveys included junction turning counts, queue lengths surveys and pedestrian crossing counts.

By combining the surveyed base flows with the traffic generation estimates for the proposed development, the following peaks were identified:

- A.M. Peak Hour: 07:45 – 08:45;
- P.M. Peak Hour: 15:15 – 16:15.

A full copy of the results of all traffic surveys can be found in Appendix G10.1, Volume III of the EIAR.

The recorded flows during the above peak hours and across the course of an average day are shown in the following:

- Diagram 10.1: 2022 A.M. Peak Hour Base Flows (07:45 – 08:45);
- Diagram 10.2: 2022 P.M. Peak Hour Base Flows (15:15 – 16:15);
- Diagram 10.3: 2022 Annual Average Daily Traffic Base Flows

The aforementioned diagrams and all others referenced in this text can be found in Appendix G10.2, Volume III of the EIAR. Any apparent discrepancy in flows between the junctions surveyed may be attributed to vehicles accessing developments and minor roads between surveyed junctions.

TA 79/99 “Traffic Capacity of Urban Roads” from the DMRB provides information on the capacity of urban roads based on classification and width. Table 10.1 following shows the capacities of various road types based on this manual and using a 60:40 split in flow.

Table 10.1 – Urban Road Capacities

2 Way Single Carriageway – Busiest Direction of Flow (60/40 split)										
		Total Number of lanes								
Carriageway Width (m)	2				2-3	3	3-4	4	4+	
	6.10	6.75	7.30	9.0	10.0		12.3	13.5	18.0	
Road Type	UM	Not Applicable								
	UAP1	1020	1320	1590	1860	2010	2550	2800	3050	3300
	UAP2	1020	1260	1470	1550	1650	1700	1900	2100	2700
	UAP3	900	1110	1300	1530	1620	*	*	*	*
	UAP4	750	900	1140	1320	1410	*	*	*	*

The local links have been classified based on the associated definitions in the DMRB. Using the previous table, link capacities have been calculated and current Ratio of Flow to Capacity (RFC) values have been assessed for the key links bordering the site. These are shown for the base year peak hours in the following table.

It should be noted that given the variation in width across the links in question, an average figure for each has been used which is rounded down to the nearest value shown in the above table, thus ensuring a conservative assessment of link capacity.

Table 10.2 – Base Year Link RFC Values for Local Network

Link	Width (m)	Link Capacity (veh/hr)	A.M. Peak (veh/hr)	RFC (%)	P.M. Peak (veh/hr)	RFC (%)
Grattan Crescent	6.1	900	693	77%	491	55%
Tyrconnell Road	6.1	900	547	61%	576	64%
Emmet Road	6.1	900	636	71%	528	59%
St Vincent Street West	6.1	900	120	13%	125	14%

As can be seen, all links are operating within capacity in the base case with Grattan Crescent Road experiencing the highest values across both peak hours.

In order to accurately assess the impact of the proposed development in the future, the base traffic flows for the local network in 2022 have been expanded to the Year of Opening and the Design Year using the medium range NRA growth factors detailed in Table 10.3 following.

Table 10.3 – Background Traffic Growth Factors

Year	Growth Rates	
	Light Vehicles	Heavy vehicles
2022 - 2024	2.74%	5.99%
2022 - 2039	16.63%	42.50%

The future year traffic flows without development can be seen in the following:

- Diagram 16.4: 2024 A.M. Peak Hour Flows – Do Nothing;
- Diagram 16.5: 2024 P.M. Peak Hour Flows – Do Nothing;
- Diagram 16.6: 2024 AADT – Do Nothing;
- Diagram 16.7: 2039 A.M. Peak Hour Flows – Do Nothing;
- Diagram 16.8: 2039 P.M. Peak Hour Flows – Do Nothing;

- Diagram 16.9: 2039 AADT – Do Nothing.

10.3.1.4 Pedestrian and Cycling Facilities

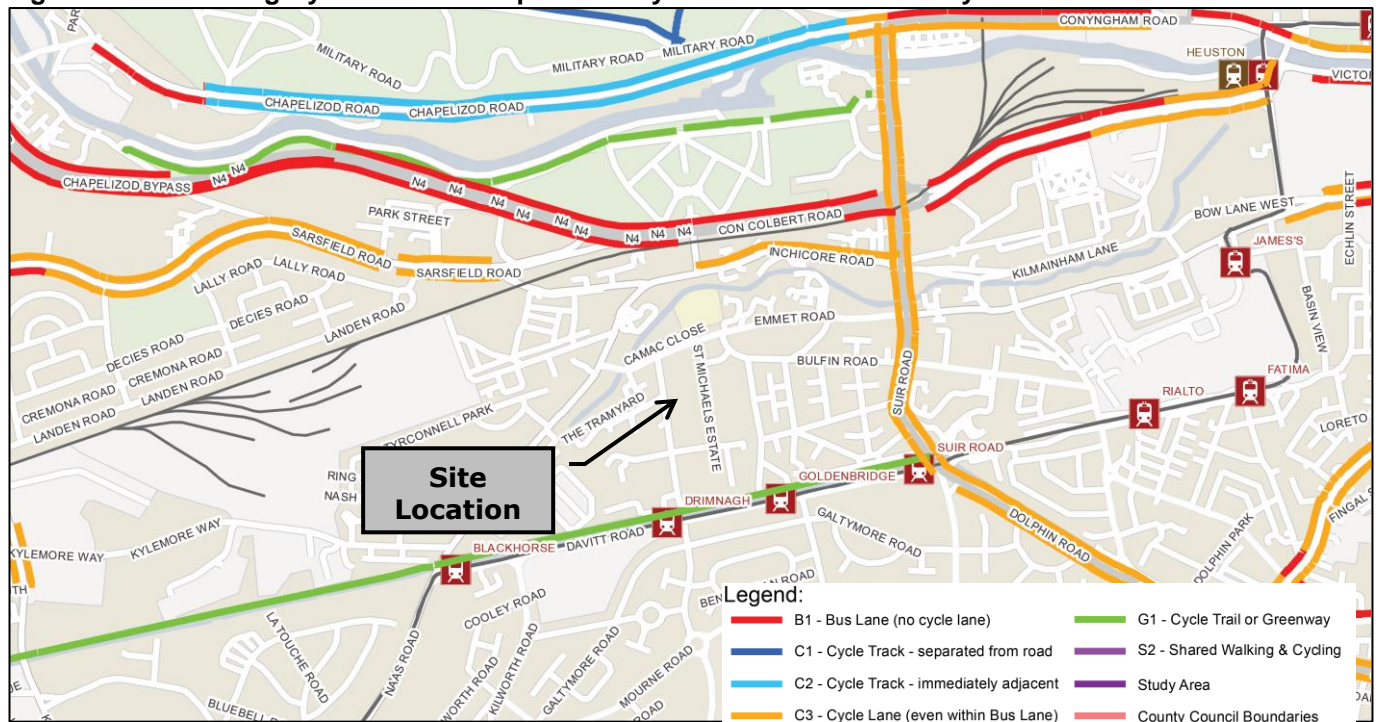
The surrounding road network includes good quality pedestrian infrastructure with public lighting throughout. There are existing pedestrian crossing facilities on Emmet Road to the northeast of the site and at major signalised junctions in the wider area. The site is within a short walking distance of a wide variety of amenities including supermarkets, convenience stores, schools, gyms, cafes, restaurants, bars etc. as well as Dublin City Centre and other employment areas such as the industrial uses to the west.

The Bus Connects proposals for Emmet Road, as part of the Liffey Valley to City Centre Core Bus Corridor, will see an upgrade to the existing bus corridor on Emmet Road and include the upgrade of the Emmet Road/St. Vincent’s Street West junction to a signalised junction which will also incorporate pedestrian crossing facilities. A planning application has been lodged to An Bord Pleanála on the 15th of July 2022 for this corridor, with construction estimated to take up to 30 months for the overall route while the Emmet Road section is expected to be completed within 18 months. As a result, a realistic estimation for completion is mid-2025.

The site is located approximately 100m from the Grand Canal which includes an existing tow path walking route to Dublin City. In terms of local amenities, the site is located in Inchicore Village which provides access to a variety of retail, leisure and community amenities within a short walking distance.

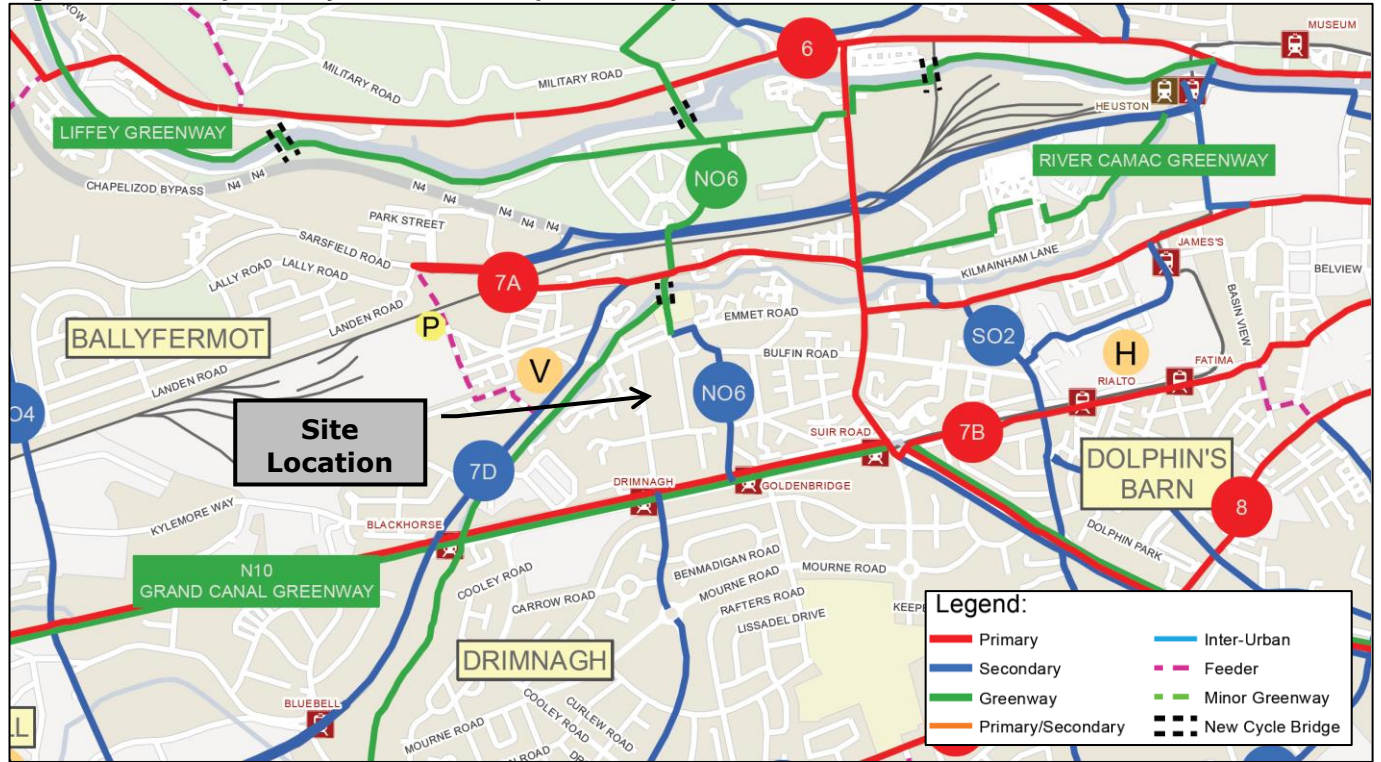
Cycle facilities in the immediate area are limited at present as per the below extract from the Greater Dublin Area Cycle Network Plan.

Figure 10.2 – Existing Cycle Network as per GDA Cycle Network Plan Survey



However, there are extensive proposals as part of this plan to improve the cycle network locally as per the following extract.

Figure 10.3 – Proposed Cycle Network as per GDA Cycle Network Plan



Of particular note are the proposals for the Grand Canal primary route, which will link the existing facilities at Portobello and Blackhorse, as well as the River Camac Greenway. The above proposals will significantly improve accessibility to the site by bicycle and facilitate a positive modal shift in that regard.

10.3.1.5 Public Transport Accessibility

The site is considered highly accessible by public transport with high quality rail and bus services operating in the local area.

The Luas Red Line is located immediately south of the development site approximately 190m (3 minutes) walk from the Drimnagh Stop and 350m (4 minutes) walk from the Goldenbridge Stop which includes a fully accessible route. The Luas Red Line offers a high frequency service between Tallaght/Saggart and Connolly/The Point Village while also interchanging with other notable public transport services at Heuston Station, Connolly Station and Busáras. These additional connections provide access to Commuter and Intercity rail and bus services throughout the country. The Luas operates from 06:00 – 01:00 with an average peak hour frequency of a tram every 4 minutes.

The Red Line also provides linkage to the heavy rail DART, Commuter and Intercity services operating out of Heuston and Connolly Station as well as linking with the Luas Green Line which operates a similar service between Broombridge and Bride’s Glen.

With respect to bus, there are a number of Dublin Bus routes operating in the area with the nearest stop located directly adjacent the northern boundary of the development site on Emmet Road. Additional routes also serve Tyrconnell Road, Bulfin Road and Suir Road. A more detailed summary of these services within a reasonable walking distance is set out in the Mobility Management Plan submitted in support of this application.

There are proposals set out as part of Bus Connects which will see an overhaul of the existing bus network in Dublin to provide an improved quality of service with increased frequency on key routes. This includes along Emmet Road which forms part of the Liffey Valley to City Centre Corey Bus Corridor and will see the provision of dedicated Bus Lanes on Emmet Road. Rail improvements include:

- The DART+ Programme which will significantly expand the DART network and allow for other improvements to existing rail lines which will dramatically increase frequency, capacity and quality of service;

- MetroLink which will link the City Centre to Swords including a stop at Dublin Airport and intersect with the Luas Red Line at O’Connell Street;
- Additional measures set out as part of the Draft Greater Dublin Area Transport Strategy including an additional Luas.

10.3.1.6 Public Transport Capacity

In order to assess the capacity of the existing public transport network relative to the development site, consideration has been given to the carrying capacity of the relevant services and the frequency of same. On-site observations of the public transport infrastructure were also carried out on the morning of 5th August and the 19th September 2022. The September survey in particular was carried out on a Monday when many colleges and universities had just reopened which would typically lead to a higher initial demand that would then settle to a lower level. As a result, this assessment has considered the worst case scenario. The results of this assessment are summarised following while the fully detailed assessment can be found in the Traffic Impact Assessment submitted as part of this application.

The capacity of public transport is considered to be most relevant for commuters leaving the site from the residential element and is a notable component in the overall transportation and parking strategy for the site. Trips associated with the other commercial, community and leisure elements are expected to spread across the course of the day with the highest usage in the evening periods, thereby limiting the demand significantly during peak hours.

The peak commuting activity from the proposed development is expected to occur between 08:00-09:00 based on the Census 2016 data available for the Electoral Division of Kilmainham C in which the development site is based and which has a population of over 5,000 residents.

Rail

The nearby Luas Red Line is served by 35 Alstom Citadis 401 trams which each have a carrying capacity of 291 no. passengers (72 no. sitting and 219 no. standing). The average frequency for the Drimnagh stop between 07:00-19:00 is every 4 minutes in both directions. This equates to an average of 15 trams in each direction in the peak hour which can facilitate 4,365 trips in each direction or a combined 8,730 trips.

The site-visit during this peak hour indicated that the Luas experienced a varied level of usership at this time. At the beginning of the peak hour trams were observed to have ample capacity even during the September surveys. Demand naturally increased towards the middle of the period, however, when one tram was experienced to be near capacity, the next tram arriving approximately 4 mins later had more capacity available. This is a regularly observed trend on the Luas given the high frequency nature of the service.

Bus

There are a number of bus services within a reasonable walking distance of the site. Of these, the highest frequency services are Dublin Bus Routes No. 13 & 40 which serve stops on Emmet Road, directly adjacent the northern boundary of the development site. The bus services operating within a 10 minute walking distance are shown following along with the number of peak hour services each morning.

Table 10.4 – Local Bus Services Peak Hour Capacity

Route	Description	No. Services		Max Capacity	
		<i>Inbound</i>	<i>Outbound</i>	<i>Inbound</i>	<i>Outbound</i>
13	Harristown – Grange Castle	7	6	665	570
40	Charlestown Shopping Centre – Liffey Valley Shopping Centre	7	7	665	665
51D	Aston Quay – Clondalkin	1	0	95	0
51x	Dunawley – UCD Belfield	0	0	0	0
52	Ringsend Road – Leixlip Intel	1	1	95	95
68/a	Hawkins St – Newcastle/Greenogue Business Park	2	1	190	95
69	Hawkins St – Rathcoole	2	1	190	95
79/a	Aston Quay – Spiddal Park / Parkwest	6	5	570	475
C1	Adamstown – Sandymount	7	3	665	285
C2	Adamstown – Sandymount	7	3	665	285
C3	Maynooth – Ringsend	2	2	190	190
C4	Celbridge – Ringsend	3	3	285	285
P29	Adamstown Station – Ringsend Road	4	0	380	0
x25	UCD to Maynooth	3	0	285	0
x26	Maynooth Towards Leeson Street Lower	3	0	285	0
x27	Celbridge to UCD	2	0	190	0
x28	Salesian College Towards UCD Belfield	3	0	285	0
x30	Lucan (Dodsboro) to UCD	3	0	285	0
x31	River Forest Towards Earlsfort Terrace	3	0	285	0
x32	Hewlett Packard Towards Earlsfort Terrace	2	0	190	0

The majority of the Dublin Bus fleet consists of buses with a passenger capacity of 95, though some increased capacity vehicles are available as part of the fleet. Conservatively assuming this is the capacity of buses using stops in the vicinity of the development site, there is capacity for approximately 9,500 passenger trips to be catered for during the peak morning period.

The site visits focussed on the highest frequency bus services which would be expected to cater for the majority of bus based trips. Specifically, capacity on Routes No. 13 & 49 was observed. The observations highlighted that there was reserve capacity available on all bus services with a combination of seats and standing room available. Again, it was noted that where some buses were observed to be near capacity, the high frequency nature of these routes resulted in a higher degree of capacity in the bus following.

10.4 CHARACTERISTICS OF THE PROPOSAL

The description of the proposed mixed use development at Emmet Road, Inchicore, Dublin 8 is detailed in Chapter 2.

10.4.1.1 Physical infrastructure

The key transportation components associated with the proposed development are as follows:

- A new entrance to the commercial/community/neighbourhood parking provided on the upper section on St. Vincent Street West with an adjacent service access for the large retail unit;
- A new entrance on the upper section on St. Vincent Street West and short section of street facilitating access for car parking, servicing and emergency vehicles;
- A new link road on the southern boundary of the site with parking and servicing bays along its length and with junctions on St. Vincent Street West and St. Michael's Estate;
- Footpaths along all boundaries of the site and within to provide a high degree of permeability through the development;
- Further public realm improvements to the northern part of the site.

- Works relating to the Irish Water upgrade required along Emmet Road.
- Related demolition of existing buildings in northern part of site (permitted Part 8 development 2221/21)

10.4.1.2 Car Parking

Car parking at the development is proposed in line with the following:

- The Dublin City Development Plan 2016-2022;
- The Draft Dublin City Development Plan 2022-2028;
- The Sustainable Urban Housing, Design Standards for New Apartments (December 2020)

The development places a particular focus on sustainability and travel by public transport and active modes given its high level of accessibility via same, as outlined earlier in this report and in further detail in the Traffic & Transport Assessment and Mobility Management Plans submitted as part of this application.

Section 16.38 of the Development notes that the standards are “*generally regarded as the maximum parking provision*” and that “*parking provision below the maximum may be permitted provided it does not impact negatively on the amenities of surrounding properties or areas and there is no potential negative impact on traffic safety*”. The Plan further states, specifically with respect to residential car parking in apartments, that “*car parking standards are maximum in nature and may be reduced in specific, mainly inner city locations where it is demonstrated that other modes of transport are sufficient for the needs of residents*” and goes on to acknowledge that car parking for residential development is largely used as car storage and not intended to promote the use of the car within the city.

The relevant maximum standards for car parking provision, as per Table 16.1 of the Development Plan, are as follows:

- Dwellings – 1 per dwelling;
- Retail Supermarkets – 1 per 100 sqm GFA;
- Other Retails – 1 per 275 sqm GFA;
- Café – 1 per 150 sqm seating area;
- Cultural and Recreational Buildings – 1 per 250 sqm GFA

Where a deviation from maximum standards is to be considered, a number of criteria are to be considered including:

- The civic importance of the scheme;
- The identified need for public car parking in the area;
- The accessibility of the surrounding area;
- The mix and appropriateness of uses proposed;
- The impact on the public realm, streetscape and urban fabric of the city;
- Compliance with policies to safeguard investment in public transport and encourage modal shift.

A similar approach is adopted in Appendix 5, Section 4.0 of the Draft Dublin City Development Plan 2022-2028. The maximum parking standards are identical with the exception of that for community uses which carries a proposed rate of 1 space per 275 sqm GFA. This change is considered immaterial in the context of the proposed development. The draft plan also makes similar provision for the reduction of car parking for highly accessible sites with good permeability which have robust mobility management measures such as are proposed for this development.

The Design Standards for New Apartments 2020 specifies additional guidance for large scale apartment developments based on their location, with the development site being defined as a “*Central and/or Accessible Urban Location*” based on its proximity to the Luas Red Line and local bus services. It further states the following with respect to such sites:

“In larger scale and higher density developments, comprising wholly of apartments in more central locations that are well served by public transport, the default policy is for car parking provision to be minimised, substantially reduced or wholly eliminated in certain circumstances. The policies above would be particularly applicable in highly accessible areas such as in or adjoining city cores or at a confluence of public transport systems such rail and bus stations located in close proximity”

Thus, based on the applicable standards along with a detailed review of local travel patterns available from the Census 2016 data, it is considered appropriate to provide a reduced level of car parking at the site. This is to be

supported by a comprehensive car parking strategy which is outlined in the Traffic & Transport Strategy and includes measures such as:

- Provision of 30 no. car club vehicle spaces to facilitate access to a car when needed on an occasional basis but not commuting activity;
- Implementation of a site specific Mobility Management Plan at the site to facilitate and encourage travel by sustainable and active modes;
- Provision of extensive, high quality cycle parking (1,285 spaces) throughout the site as follows:

Community Hub & Library	30	
Supermarket		28
Retail / Commercial / Café	8	
Creche		10
Residential in Commercial Mixed Use - Block C		152
Main Residential - Block A & B		768
Residential Visitors in Commercial Mixed Use - Block C		46
Main Residential Visitors - Block A & B		243
Bicycle Parking / Storage Subtotal	1,285	

The residential spaces in particular will be of a notably high quality, located in sheltered and secure areas and incorporating varying types of parking including cargo bikes;

- A comprehensive communication strategy which will be in place from first contact with potential residents to advise them of parking availability, controls and measure in place to facilitate reduced car ownership and the site accessibility by sustainable and active means;
- Effective car parking management and control measures including signage, communication and clamping procedures for any unauthorised parking at the site.

Taking the above into consideration, it is proposed to provide the following parking at the development:

- Residential (non-car care) – 20 no. spaces;
- Residential (car share) – 30 no. spaces;
- Retail/Community/Village – 54 no. spaces;
- Cemetery – 2 no. spaces.

The 54 no. retail, community and village spaces are proposed both to serve the proposed development but also the wider Inchicore Village, facilitating access to the wider local amenities by the community for those who require access by car or may be already on the road network and wish to stop as a pass-by trip. The limited number of spaces means they will not act as a significant trip generator or encourage car based travel while also facilitating the loss of existing, un-marked parking areas on St. Vincent's Street West. These spaces will be controlled via a pay & display parking ticket system similar to any on-street parking in the city and will be secured at night.

10.4.1.3 Trip Generation

The residential and supermarket units of the proposed development are expected to be the primary trip generator and form the basis of the development trip generation estimates. The ancillary elements (café, Community Hub/Library) are not expected to be primary trip generators and are instead expected to serve local residents at the development and in the surrounding areas as well as pass-by trips from those already on the local road network. As a result, they have not been included in this assessment from a trip generation perspective.

The traffic generation potential of the proposed development has been estimated using the TRICS software modelling database which is an industry-standard tool. When developing traffic generation estimates for any development, a number of surveys are selected from the database based on a range of factors including development type, size, location, public transport etc. The results are then used to establish trip rates for the development in question which is ultimately used to derive estimates for traffic generation. The TRICS output files relative to this assessment can be found in Appendix G 10.3, Volume III of the EIAR.

In this instance, particular focus was given to the car parking provision proposed for the development which will significantly reduce the trip generation potential of the apartments in particular. However, the Trics database contains

limited information of similar sites with such a low level of provision meaning a conservative approach has been adopted where surveys at sites with a high level of parking provision have been used to development the following estimates

The trip generation estimates have been produced for the proposed development are shown in the following table.

Table 10.5 – Proposed Development Estimated Trip Generation

Time Range	Apartments		Supermarket	
	Arrivals	Arrivals	Departures	Departures
00:00-01:00	0	0	0	0
01:00-02:00	0	0	0	0
02:00-03:00	0	0	0	0
03:00-04:00	0	0	0	0
04:00-05:00	0	0	0	0
05:00-06:00	0	0	0	0
06:00-07:00	0	0	1	0
07:00-08:00	11	18	2	18
08:00-09:00	9	18	16	18
09:00-10:00	20	14	32	14
10:00-11:00	20	13	37	13
11:00-12:00	14	21	45	21
12:00-13:00	9	13	44	13
13:00-14:00	11	11	47	11
14:00-15:00	8	13	46	13
15:00-16:00	16	14	46	14
16:00-17:00	29	20	51	20
17:00-18:00	21	13	48	13
18:00-19:00	27	21	39	21
19:00-20:00	27	21	28	21
20:00-21:00	8	8	22	7
21:00-22:00	0	0	10	0
22:00-23:00	0	0	3	0
23:00-24:00	0	0	4	0
Daily Trips:	230	218	520	217

The additional traffics outlined above was assigned to the study area based on existing traffic flows in the area combined with an assessment of the local network layout.

The assigned flows mentioned above are shown in the following diagrams:

- Diagram 16.10: A.M. Peak Hour Trip Generation & Assignment – Do Something;
- Diagram 16.11: P.M. Peak Hour Trip Generation & Assignment – Do Something;
- Diagram 16.12: AADT Trip Generation & Assignment – Do Something.

10.5 POTENTIAL IMPACT (EFFECTS) OF THE PROPOSAL

10.5.1.1 Construction Phase

Construction of the proposed development will result in traffic generation as a result of private vehicles owned and driven by site construction staff, materials deliveries and materials removals. The potential haul routes will need to take cognisance of the designated HGV routes in the city centre as per the Dublin City Cordon Restrictions.

Construction Activity: The period (time of day and day of week) during which construction activities will be permitted on-site, and during which construction traffic will be travelling across the local road network are set out in the Outline Construction and Environmental Management Plan. This includes works between the hours of 07:00 to 18:00 Monday to Friday (excluding bank holidays) and 08:00-14:00 on Saturdays with no construction activities on Sundays and Bank Holidays. As a result, the majority of workers travelling to and from the site will arrive before the a.m. peak hour and depart after the p.m. peak hour. It should be noted that a large proportion of construction workers would arrive in shared transport while the accessible nature of the site will facilitate travel by sustainable modes for many. Thus, the increase in peak hour traffic will be limited.

Construction Traffic Generation: The peak trip generation with respect to the construction stage is expected to relate to the removal of material from the site during both the demolition and construction stages when there will be additional HGV movements to and from the site. Utilising typical construction rates and allowing for site logistics and management, during the excavation stage, there could a maximum of 10 no. truckloads per hour on a given site. However, the scale of demolition, site clearance and excavation on this site is limited meaning a lower average rate of 2 no. truck movements per hour is estimated, equating to 4 no. two-way HGV movements per hour. Assuming a 11-hour working day, this equates to 44 no. two-way HGV movements per day on the local road network. All suitable material will be reused for construction and fill activities where possible and appropriate. All spoil material will be removed to a registered landfill site in consultation with the local authority. In addition to the traffic generated by the disposal of surplus subsoil from the site, there will be traffic generated from construction staff and deliveries of construction materials and equipment though these will be spread across the course of the day limiting the potential impact during the peak hours in particular.

Construction Traffic Routing: It is expected that the construction ‘haul’ route will be via Emmet Road to Tyrconnell Road, travelling south to the R110 Naas Road and on until meeting the main motorway network i.e. M50 & M7.

The predicted construction HGV and staff vehicle generation levels as summarised above are expected to be lower than those predicted during the operational stage. The impact at operation stage is predicted to be not significant and therefore the lower vehicular traffic generated at construction stage is predicted to have a lesser impact compared to the operational stage. In addition, the peak construction stage traffic will occur before the local road networks AM peak hour (07:45-08:45) and after the PM peak hour (15:15-16:15). Outside of peak network hour times, the local junctions and road links will have significantly more capacity compared to the peak hours and therefore are predicted to have more than enough capacity to accommodate the predicted construction vehicular traffic generation.

Additional potential impacts which will require specific mitigation to address relate to increased potential for conflict between vehicles and vulnerable road users as well as potential negative impacts from noise, vibration and dust. These are discussed in further detail in the following sections including an assessment of the residual impact once the identified mitigation measures are in place.

10.5.1.2 Operational Phase

The operational phase of the development will lead to increased traffic movements on the local road network. This in turn has the potential to lead to increased congestion, increased potential for conflict between vehicles and vulnerable road users and an increase in the emissions from vehicles. Given the scale of development, the table following summarises the identified likely significant effects of the proposed development in the absence of any mitigation during the operational phase, as per Section 3.7.3 of the EIAR Guidelines.

Table 10.6 – Potential Operation Stage Impact in the Absence of Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Excessive car usage	Adverse	Significant	Wider road network	Likely	Long term	Worst case
Increased traffic congestion	Adverse	Significant	Wider road network	Likely	Long term	Worst case
Poor site permeability negatively impacting pedestrian and cycle movements	Adverse	Moderate	Travel routes in the immediate area	Likely	Long term	Worst case
Increased risk of accident due to	Adverse	Slight	Wider road network	Likely	Long term	Worst case

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
increased vehicle movements						
Failure to realise local and national sustainable transport objectives	Adverse	Moderate	Wider road network	Likely	Long term	Worst case

10.5.2 Risks to Human Health

The risks to human health from a transportation perspective, as outlined previously and in the absence of any mitigation being considered at this point of the assessment, relate to the increased potential for emissions from additional congestion (operational stage), increased potential for conflict between vehicles and vulnerable road users (construction and operation stage) as well as potential negative impacts from noise, vibration and dust (construction and operation stage).

10.5.2.1 “Do-nothing” scenario

The proposed development site generates no additional traffic. In the absence of the proposed development, the overall operational performance of the existing junctions on the surrounding road network will be affected by the impact caused by committed development and forecast background network traffic growth (should that growth arise).

10.6 REMEDIAL OR REDUCTIVE MEASURES

10.6.1.1 Construction phase

A Construction and Environmental Management Plan (CEMP) accompanies this application and sets out the measures to mitigate the impact on the local environment during the construction phase. A Construction Traffic Management Plan (CTMP) based on the CEMP will be developed by the appointed contractor and submitted to An Bord Pleanála for approval prior to commencement of work. It will implement the relevant Mitigation Measures in this EIA including the CEMP accompanying this planning application (contained in Appendix B Volume III of this EIA).

A number of measures are proposed for the construction stage and will include:

- Limited on-site parking will be provided to encourage staff to travel by more sustainable means including public transport and/or car sharing, particularly given the proximity of the Luas station and bus services to the development site;
- Adequate on-site compounding will be provided to prevent any potential overflow onto the local transport network;
- The potential for construction staff to be brought to the site in vans/minibuses and other similar mobility management measures to limit trip generation will be investigated;
- Delivery vehicles travelling to and from the site can be controlled to a degree and so will be spread across the course of the working day meaning the number of HGV's travelling during the peak hours will be relatively low.

Further mitigation measures are outlined for the Construction Stage as set out in the Construction and Environmental Management Plan included in support of this application which includes details such as:

- Hoarding & site security;
- Site compound;
- Site access & egress;
- Site deliveries;
- Storage of materials;
- Removal of materials from site;
- Hours of Work;
- Public relations & Community Liaison;
- Environmental management
- Dust, dirt, noise and vibration management;
- Management of harmful materials
- Construction traffic management;

10.6.1.2 Operational phase

Mitigation measures for the operational stage have primarily been incorporated into the development design, with further plans set out to support these measures.

The key design mitigation measures are:

- Reduction in provision of private car parking spaces to reduce the level of car ownership at the site and the associated potential for unnecessary car based trips generated by the development;
- Provision of an extensive number of car club spaces across the site to facilitate occasional and necessary travel by car but not practical for commuting purposes;
- Provision of varied and high quality cycle parking options throughout the development site including cargo bike spaces which can facilitate an increased number of trips by bicycle;
- A high degree of permeability through the site to the benefit of residents and users, providing connectivity to local amenities and public transport options as well as through movements.

The supporting mitigation measures include:

- Implementation of a site specific Mobility Management Plan to facilitate and encourage travel by sustainable and active modes, thereby reducing car based travel;
- Implementation of a site specific Car Parking Strategy to facilitate the reduced car ownership at the site as outlined in the Traffic & Transport Assessment and summarised earlier in this chapter.

10.7 PREDICTED (RESIDUAL) IMPACT OF THE PROPOSAL

10.7.1.1 Construction phase

Taking the potential impact of the proposed development outlined earlier combined with the identified mitigation measures, the residual impact of the construction stage is assessed as follows:

- Increased vehicles numbers are estimated to be limited during peak hours which is expected to have a negligible impact on traffic. Consequently, associated traffic and health impacts will also be low;
- The mitigation measures will control the dust, noise and vibration impacts from the development to acceptable levels and so are expected to have a negligible impact on traffic and human health;
- There will be increased vehicle and HGV movements, however, these will be relatively low due to the limited excavation requirements and control of delivery schedules will allow the impact to be spread across the course of the day. Consequently, associated traffic and health impacts will be low;
- The urban nature of the local environment lends itself to lower speeds and the limited increase in vehicle numbers combine with effective traffic management measures to be put in place means there is expected to be no real increase in risk to other vulnerable road users.

In line with Section 3.7.3 of the 2022 EPA guidelines, the residual impact of the construction phase in terms of traffic and transport will be negative, not significant, local, likely and short-term. The measures outlined in the CEMP, as set out above, will help alleviate the impact of the additional traffic and limit the impact to outside the busier peak hours. The measures, including dirt and dust mitigation, will also ensure the standard of the public road network is maintained in terms of dust and dirt from construction traffic

10.7.1.2 Operational phase

In order to assess the residual impact of the operational development on the local road network, a number of different scenarios have been analysed as follows:

- Base Year (2019) – The current performance of the local road network was initially assessed along with the impact of the proposed development to establish which junctions require more detailed analysis;
- Year of Opening (2024) – The performance of the local road network was then assessed for the Year of Opening. In order to show the true impact of the proposed development, both the Do Nothing and Do Something scenarios were analysed;
- Design Year (2039) – The local road network was analysed for Design Year considering the Do Nothing and Do Something Scenario.

The junction analysis was carried out using Junctions 9 and the link capacities for the Year of Opening and the Design Year were assessed based on the same methodology outlined earlier in this chapter.

10.7.1.3 Base Year

The scale of development meets the threshold for a Traffic & Transport Assessment to be carried out based on the Traffic & Transport Assessment Guidelines (2014) standards. However, further guidance is also provided regarding the scope of the assessment and what junction need to be assessed in more detail. Specifically, the guidelines state:

“In general, the study area should include all road links and associated junctions where traffic to and from the development may be expected to exceed 10% of the existing traffic movements, or 5% in congested or other sensitive locations, including junctions with national roads. Where two or more of the supplementary criteria as indicated in Table 2.3 apply in relation to any of the adjoining links or junctions, then those links and junctions should also be considered for inclusion in the study area”

The percentage increase in traffic as a result of the development is shown in the following:

- Diagram 16.13: % Impact of Development on A.M. Peak Traffic;
- Diagram 16.14: % Impact of Development on P.M. Peak Traffic;

The above figures show that the increase in traffic as a result of the existing Junctions 2 & 4 are over 5% within the study area, it was therefore considered that the existing Junctions 2 & 4 required further analysis.

10.7.1.4 Year of Opening

As noted previously, the assessment considers the Do Nothing and Do Something. The Do Something scenarios are established by adding the traffic estimated to be generated by the proposed development and approved third party developments to the local network, as shown in the following:

- Diagram 16.15: 2024 A.M. Peak Hour Flows Do Something;
- Diagram 16.16: 2024 P.M. Peak Hour Flows Do Something;
- Diagram 16.17: 2024 AADT Do Something;

Prior to the analysis of the individual junctions, the main links in the network have been assessed for the year of opening Do Something scenario, with the results shown following.

Table 10.7 – 2024 Do Something Link RFC Values

Link	Width (m)	Link Capacity (veh/hr)	A.M. Peak (veh/hr)	RFC (%)	P.M. Peak (veh/hr)	RFC (%)
Grattan Crescent	6.1	900	720	80%	519	58%
Tyrconnell Road	6.1	900	570	63%	611	68%
Emmet Road	6.1	900	667	74%	571	63%
St Vincent Street West	6.1	900	147	16%	187	21%
South Circular Road	6.1	900	599	67%	612	68%

As can be seen, the local links continue to operate with reserve capacity with RFC values remaining below 80% in each instance despite the increased traffic levels.

The tables following show the results of the Do Nothing and Do Something analysis for the Year of Opening, thereby allowing for a direct comparison of both scenarios to highlight the true impact of the proposed development.

When considering the below results, the following should be taken into account:

- For the existing signalised Junction 4 in the Do Nothing and Do Something scenarios, the pedestrian phases have been included in every cycle given the high level of pedestrian activity in the area;
- Traffic signals for each scenario have been optimised to show the optimal performance of the junction;
- As with the link capacity analysis, RFC is a measure of the ratio of traffic flows to capacity and the figures shown represent a percentage value. 100% indicates a junction is at maximum capacity while 90% is the preferred limited for signalised junctions and 85% the preferred limited for priority junction;
- All queue lengths are shown in Passenger Car Units (PCUs) with 1 PCU equivalent to a car;
- All RFC values and queue lengths shown represent the maximum experienced by the respective arm;
- The output files from all modelling analysis can be found in Appendix G10.4, Volume III of the EIAR.

Junction 2

Table 10.8 – Junction 2 – 2024 Peak Hour Do Nothing Analysis Results

Approach	A.M. Peak Hour		P.M. Peak Hour	
	Queue	RFC	Queue	RFC
St Vincent Street West	0.2	17	0.6	21
Emmet Road (W)	0.7	23	0.6	21
Emmet Road (E)	-	-	-	-

Table 10.9 – Junction 2 – 2024 Peak Hour Do Something Analysis Results

Approach	A.M. Peak Hour		P.M. Peak Hour	
	Queue	RFC	Queue	RFC
R155 (S)	0.3	19	0.5	31
R125 (E)	0.9	27	0.9	31
R125 (W)	-	-	-	-

The results show that the junction operates within capacity with the development in place, with relatively minor increases in RFC values and queue lengths relative to the Do Something Scenario.

Junction 4

Table 10.10 – Junction 4 – 2024 Peak Hour Do Nothing Analysis Results

Approach	A.M. Peak Hour		P.M. Peak Hour	
	Queue	RFC	Queue	RFC
Emmet Road (W)	3.27	32	2.6	26
Turvey Avenue	0.05	3	0.03	2
Emmet Road (E)	2.65	29	3.7	39
Luby Road	0.14	8	0.15	11

Table 10.11 – Junction 4 – 2024 Peak Hour Do Something Analysis Results

Approach	A.M. Peak Hour		P.M. Peak Hour	
	Queue	RFC	Queue	RFC
Emmet Road (W)	3.67	35	3.03	30
Turvey Avenue	0.05	3	0.03	2
Emmet Road (E)	2.82	31	4.08	43
Luby Road	0.16	8	0.19	12

The results show that the junction continue to operate with a significant reserve capacity and low queue length, despite the trips generated by the proposed development is included.

10.7.1.5 DESIGN YEAR

As before, the Do Something traffic flows are established by adding the traffic estimated to be generated by the proposed developments to the local network in the design year, as shown in the following:

- Diagram 16.18: 2039 A.M. Peak Hour Flows Do Something;
- Diagram 16.19: 2039 P.M. Peak Hour Flows Do Something;
- Diagram 16.20: 2039 AADT Do Something;

Prior to the analysis of the individual junctions, the main links in the network have been assessed for the year of opening Do Something scenario, with the results shown following.

Table 10.12 – 2039 Do Something Scenario Link RFC Values

Link	Width (m)	Link Capacity (veh/hr)	A.M. Peak (veh/hr)	RFC (%)	P.M. Peak (veh/hr)	RFC (%)
Grattan Crescent	6.1	900	820	91%	591	66%
Tyrconnell Road	6.1	900	650	72%	696	77%
Emmet Road	6.1	900	762	85%	650	72%
St Vincent Street West	6.1	900	165	18%	205	23%
South Circular Road	6.1	900	682	76%	695	77%

As can be seen, the local links continue to operate below normal capacity limits in Design Year Do Something Scenario.

The tables following show the results of the Do Nothing and Do Something analysis for the Design Year, thereby allowing for a direct comparison of all scenarios to highlight the true impact of the proposed development. When considering the following results, the factors outlined for the year of opening analysis continue to apply.

Junction 2

Table 10.13 – Junction 2 – 2039 Peak Hour Do Nothing Analysis Results

Approach	A.M. Peak Hour		P.M. Peak Hour	
	Queue	DOS	Queue	DOS
St Vincent Street West	0.3	22	0.3	23
Emmet Road (W)	1.1	30	0.9	27
Emmet Road (E)	-	-	-	-

Table 10.14 – Junction 2 – 2039 Peak Hour Do Something Analysis Results

Approach	A.M. Peak Hour		P.M. Peak Hour	
	Queue	DOS	Queue	DOS
St Vincent Street West	0.4	25	0.7	39
Emmet Road (W)	1.3	35	1.4	38
Emmet Road (E)	-	-	-	-

Again, the results show that the junction operates within capacity with the development in place, with relatively minor increases on most of the arms in RFC values and queue lengths relative to the Do Something Scenario.

Junction 4

Table 10.15 – Junction 4 – 2039 Peak Hour Do Nothing Analysis Results

Approach	A.M. Peak Hour		P.M. Peak Hour	
	Queue	DOS	Queue	DOS
Emmet Road (W)	4.12	38	3.09	30
Turvey Avenue	0.07	4	0.04	3
Emmet Road (E)	3.13	34	4.33	46
Luby Road	0.22	10	0.25	15

Table 10.16 – Junction 4 – 2039 Peak Hour Do Something Analysis Results

Approach	A.M. Peak Hour		P.M. Peak Hour	
	Queue	DOS	Queue	DOS
Emmet Road (W)	4.3	39	3.54	33
Turvey Avenue	0.08	4	0.05	3
Emmet Road (E)	3.27	35	4.73	50
Luby Road	0.26	11	0.32	17

Again, the results show that the junction operates within capacity with the development in place, with relatively minor increases on most of the arms in RFC values and queue lengths, despite the traffic level is expected to be increased.

With the mitigation measures in place, the impact of the proposed development on traffic and transport will be not significant, neutral, local and long-term. The proposed development site is ideally situated to have an extremely low car mode share and with the supporting measures identified in the MMP in place car traffic may be lower than that assumed in the modelling assessment. However, even with a higher car mode share modelled the impact will be slight. The delays for traffic on the local network are in general minor with no significant delays modelled as result of the additional development. Thus, the residual impact of the development with mitigation measures considered and in line with Section 3.7.3 of the EIAR guidelines are summarised as follows.

Table 10.17 – Residual Operation Stage Impact with Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Car usage	Neutral	Imperceptible	Local road network	Unlikely	Long term	Residual
Traffic congestion	Neutral	Imperceptible	Local road network	Unlikely	Long term	Residual
Site permeability for pedestrian and cycle movements	Neutral	Imperceptible	Travel routes in the immediate area	Likely	Long term	Residual
Risk of accident due to vehicle movements	Neutral	Imperceptible	Local road network	Unlikely	Long term	Residual
Realising local and national sustainable transport objectives	Positive	Moderate	Wider transport network	Likely	Long term	Residual

10.7.1.6 Public Transport Demand

The development places a particular emphasis on the availability and use of sustainable travel. As noted earlier in this chapter, there are a number of high frequency rail and bus services operating within a short walking distance of the site which will be an attractive option for residents travel needs.

The ability of these services to cater for the proposed development is set out in detail in the Traffic Impact Assessment submitted as part of this application with the results of same summarised following.

There is an estimated maximum capacity for 8,730 rail trips and 9,500 bus trips during the peak morning period which is considered to represent the peak daily demand. During this period, the residential development will be the primary trip generator, with negligible demand generated by the commercial and community elements.

In order to develop an estimate for the development population, the following average occupation of units has been assumed:

- Studio & 1 Bed – 1.5 residents per unit;
- 2 Bed – 3 residents per unit;
- 3 Bed – 4 residents per unit.

Based on the above, this equates to an overall population of 1,357 residents at the development. This assessment has assumed a worst case scenario where all residents are either working or attending school or college. In reality, there are likely to be a number of residents who do not work or attend school e.g. retirees or young children, meaning the assessment is conservative.

The Census data for the Electoral Division of Kilmainham C, in which the development site is located, has been further interrogated to get an accurate estimate for modal share and time of commute. Consideration has also been given to the level of car parking provision. Thus, the modal share targets for the development, as shown in the Mobility Management Plan prepared as part of this application, are as follows:

Table 10.18 – Proposed Development Target Modal Share

Mode	Modal Share
Walking	26%
Bicycle	17%
Bus	30%
Rail	19%
Work From Home	5%
Car Driver	2%
Car Passenger	1%

The above has a very conservative allowance for work from home which is likely to be notably higher given the long term impact of the worldwide pandemic which has highlighted this option as a viable working practice for many.

Applying the above to the estimated development population gives 407 bus users and 258 rail users. The Census data has been further interrogated to establish the expected number of people travelling during the peak hours. The data for Electoral Division of Kilmainham C indicates that 41.6% of people travel between 08:00-09:00. Thus, the development is expected to generate a peak hour demand for 169 bus users and 107 rail users.

In the context of the aforementioned bus and rail service capacity locally, the demand generated by the development equates to approximately 1.8% of the bus capacity and 1.2% of the rail capacity which is considered negligible. Furthermore, on-site observations during both August and September have indicated that there is sufficient peak hour capacity available on these services to cater for this level of demand.

10.8 DIFFICULTIES ENCOUNTERED

It is noted that the ongoing Covid 19 pandemic is expected to have a significant but currently unquantifiable, impact on future traffic growth. In light of this, the traffic growth allowed for is considered to be very conservative in nature and, particularly for the Design Year, the estimated traffic flows which form the basis of this assessment and unlikely to be realised and traffic flows in practice are expected to be lower.

10.9 MONITORING

The construction phase will be monitored by the appointed site manager and regular progress reports will be prepared. The manager will ensure the mitigation measures outlined will be implemented and adhered to.

A mobility manager will be appointed from within the management company to ensure the implementation of the Mobility Management Plan. They will also be responsible for the undertaking of post occupation travel surveys and act as a point of contact for residents for all mobility and access related issues.

The Management Company will be responsible for the continued implementation of the site specific parking strategy to ensure effective communication and control is ongoing.

10.10 POTENTIAL CUMULATIVE IMPACTS

Allowance has been made for background traffic growth which allows for a variety of factors including additional traffic generated by development in the local and wider area, increased levels of car ownership and increased vehicle trips as a result of projected improvements to economic activity. This is considered a conservative approach given that these projections are likely to be higher than what will be experienced post-Covid 19 pandemic given the associated impacts to economic activity and work practices which will see a permanent reduction in commuting activity. Car ownership levels, in Dublin in particular, are also expected to reduce in line with local and national sustainable travel and planning policies. This background traffic growth allows for cumulative development in the area and on a wider basis, with the factors applied specific to the site location in Dublin. With respect to permitted development which has yet to be completed, the following are of key relevance:

- Planning Register reference: 4260/19 – 52 no. older persons apartments including 13 no. new car parking spaces in St. Michael's Estate west of the proposed development site. The nature of the development combined with the low level of parking provision mean the potential traffic impact is negligible and is considered to be accounted for in the conservative background traffic growth allowance;
- Planning register Reference: ABP-303435-19 – 265 no. build to rent apartments with 119 car parking spaces on the former Duplex site south of the canal relative to the proposed development. This development is located on the opposite side of the canal relative to the proposed development which limits the potential interaction of traffic within the study area, after which the traffic associated with the proposed development will have dispersed to the extent that would make its impact negligible. In particular, there is limited potential for traffic from the SHD development to route along Emmet Road based on consideration of reasonable travel desire lines. As a result, the potential traffic impact in the study area is negligible and is considered to be accounted for in the conservative background traffic growth allowance.

For the construction stage, there is potential for an overlap between construction activity associated with the development and the proposed Liffey Valley to City Centre Core Bus Corridor being delivered as part of BusConnects and which includes the section of Emmet Road bordering the development site. While a planning application has been lodged for the bus corridor upgrades, a decision is still pending. Nevertheless, the trip generation potential of these works is limited, as is that for the proposed development as outlined previously. On that basis, the key consideration will be the traffic management proposals associated with the works to ensure the appropriate management of traffic within the area. These are set out in detail as part of the BusConnects application and would facilitate the traffic associated with the proposed development construction in the same manner as it is proposed to facilitate general traffic in the area. The construction access for the proposed development will not be on Emmet Road which will further reduce any potential interaction between the two projects. Overall, the construction periods will be temporary in nature and subject to strict and co-ordinated traffic management requirements to mitigate any potential impact.

Taking the above into consideration, the potential cumulative impact has been assessed in full.

10.11 INTERACTIONS

Please refer to Chapter 16 of the EIAR for interactions.

11.0 MATERIAL ASSETS – WASTE MANAGEMENT

11.1 INTRODUCTION

This Chapter of the EIAR has been prepared by Byrne Environmental Consulting Ltd to identify and assess the waste impacts associated with the proposed Emmet Road mixed-use development during both the Construction and Operational Phases.

11.2 STUDY METHODOLOGY

The Construction and Demolition waste management aspect of the development has been prepared to evaluate the volume and nature of waste generation arising during the construction stage of the proposed development, assess the potential impact of this on the receiving environment, to identify appropriate mitigation measures to eliminate and/or reduce these impacts to an acceptable level and comply with the following relevant legislation and relevant Best Practice Guidelines:

- *Waste Management Acts 1996-2011;*
- *Waste Management (Collection Permit) Regulations 2007 (SI No. 820 of 2007).*
- *Waste Management (Collection Permit) Amendment Regulations 2008 (SI No. 87 of 2008).*
- *EPA “Guidance on Soil and Stone By-Products in the context of Article 27 of the European Communities (Waste Directive) Regulations – Version 3 June 2019*
 - *Directive 2014/52/EU*
 - *EPA Draft Best Practice Guidelines for the preparation of resource management plans for construction and demolition projects, April 2021*

The proposed Operational Waste Management aspect of the development has been prepared to evaluate the volume and nature of waste generation arising during the operational phase of the proposed development, assess the potential impact of this on the receiving environment, to identify appropriate mitigation measures to eliminate and/or reduce these impacts to an acceptable level and comply with the following relevant legislation and relevant Best Practice Guidelines including Dublin City Council’s design standards and policies for waste management in residential developments.

- *Waste Management Acts 1996.*
- *Waste Management (Collection Permit) Regulations 2007 (SI No. 820 of 2007).*
- *Waste Management (Collection Permit) Amendment Regulations 2008 (SI No. 87 of 2008).*
- *Eastern-Midlands Region Waste Management Plan*
- *Section’s 4.8 and 4.9 Refuse Storage of The Department of Housing, Planning and Local Government – Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities. 2018.*
- *Dublin City County Development Plan 2022 – 2028.*

11.2.1 Dublin City Waste Management Standards

The Draft Dublin City Development Plan 2022-2028 includes waste management standards as follows:

Appendix 7 – 1.0 Design Considerations – 1.1 Standards for Residential Developments / Apartments and 1.2 Standards for Commercial/Industrial Developments of the Draft Dublin City Council Development Plan 2022 – 2028 is reproduced below.

DCC Appendix 7 Standards for Residential Developments / Apartments

Waste storage issues should be considered at the initial design and pre planning stage of all residential developments to ensure access for all (including people with disabilities), in a brightly lit, safe and well-signed area, spacious enough for easy manoeuvrability, with good ventilation and ready access if required for the control of potential vermin. Where storage is provided in a basement area, sufficient access and egress must be provided to enable receptacles to be moved easily from the storage area to an appropriate collection point on the public street nearby. Provision shall also be made for the storage and collection of waste materials in apartment schemes in accordance with the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities 2018.

The following are also requirements:

- Receptacles that are designed for reuse, with the exception of a specific area designated by a local authority as being only suitable for the collection of non-reusable receptacles such as bags, ideally of 1,100 litre capacity, must be used.
- To provide a three-bin collection system for residents in communal collection schemes, for each type of waste: general waste, dry recyclables and organic food/garden waste. A proposal on the three-bin system including bin quantity, type and frequency of collection must be submitted in writing to the Waste Regulation Unit in Dublin City Council for agreement.
- Sufficient space must be provided to accommodate the collection of dry recyclables and organic kitchen waste/ garden waste.
- Suitable wastewater drainage points should be installed in the receptacle bin storage area for cleaning and disinfecting purposes.

DCC Appendix 7 1.2 Standards for Commercial / Industrial Developments

- Receptacles that are designed for reuse, with the exception of in specific areas designated by a local authority as being only suitable for the collection of non-reusable receptacles such as bags, ideally of 1,100 Litre capacity, must be used.
- Adequate storage space for a minimum of one No. 1,100 Litre receptacle.
- Sufficient space must be provided to accommodate the collection of dry recyclables and organic kitchen waste/ garden waste.
- Adequate space and height for a standard refuse collection vehicle (RCV) to access site.
- Sufficient access and egress must be provided to enable receptacles to be moved easily from the storage area to an appropriate collection point on the public street nearby.
- Receptacle storage areas must not be on a public street nor be visible or accessible from there.
- The receptacle storage areas should be designed so that each bin within the storage area is accessible to occupants/ employees of the

development (including people with disabilities).

- Suitable wastewater drainage points should be installed in the bin storage area for cleaning and disinfecting purposes.
- Waste storage areas should not present any safety risks to users and should be well-lit.
- Adequate ventilation of waste storage areas so as to minimise odours and potential nuisance from vermin/flies.

The Operational Phase of the Waste Management Plan has also been prepared with regard to relevant waste management policies and objectives of the draft *Dublin City Council Development Plan 2022 – 2028* as detailed below:

It is the Policy of Dublin City Council:	
SI27	<p>Sustainable Waste Management</p> <p>To support the principles of the circular economy, good waste management and the implementation of best practice in relation to waste management in order for Dublin City and the Region to become self-sufficient in terms of resource and waste management and to provide a waste management infrastructure that supports this objective.</p>
SI28	<p>Sustainable Waste Management</p> <p>To prevent and minimise waste generation and disposal, and to prioritise prevention, recycling, preparation for reuse and recovery in order to safeguard against environmental pollution.</p>
SI29	<p>Segregated Storage and Collection of Waste Streams</p> <p>To require new commercial and residential developments, to include adequate and easily accessible storage space that supports the separate collection of as many waste and recycling streams as possible, but at a minimum general domestic waste, dry recyclables and food waste as appropriate (for further guidance see Appendix 7).</p>
SI30	<p>Waste Management in Apartment Schemes</p> <p>To require that the storage and collection of mixed dry recyclables, organic and residual waste materials within proposed apartment schemes have regard to the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities 2018 (or and any future updated versions of these guidelines produced during the lifetime of this plan).</p>
SI31	<p>Provision of Public Recycling Facilities in Large Retail Developments</p> <p>To require new retail developments in excess of 1,000sq.m (net) in size to provide for a local bring centre/ public reuse and recycling facilities on-site, where feasible, in line with the principles of the 15-minute city. The facilities should be adequately-sized and located to be easily accessible to the general public and should specifically provide for textile and glass bottle recycling (for further guidance see Section 15.18.3).</p>

11.2.2 Waste Hierarchy

It is Council policy to conform to the waste hierarchy (Figure 11.1), whereby waste prevention is the most preferred strategy. Where waste generation is unavoidable, re-use is the most preferred fate, followed by recycling and then energy recovery, with disposal (e.g., to landfill) being the least preferred fate.

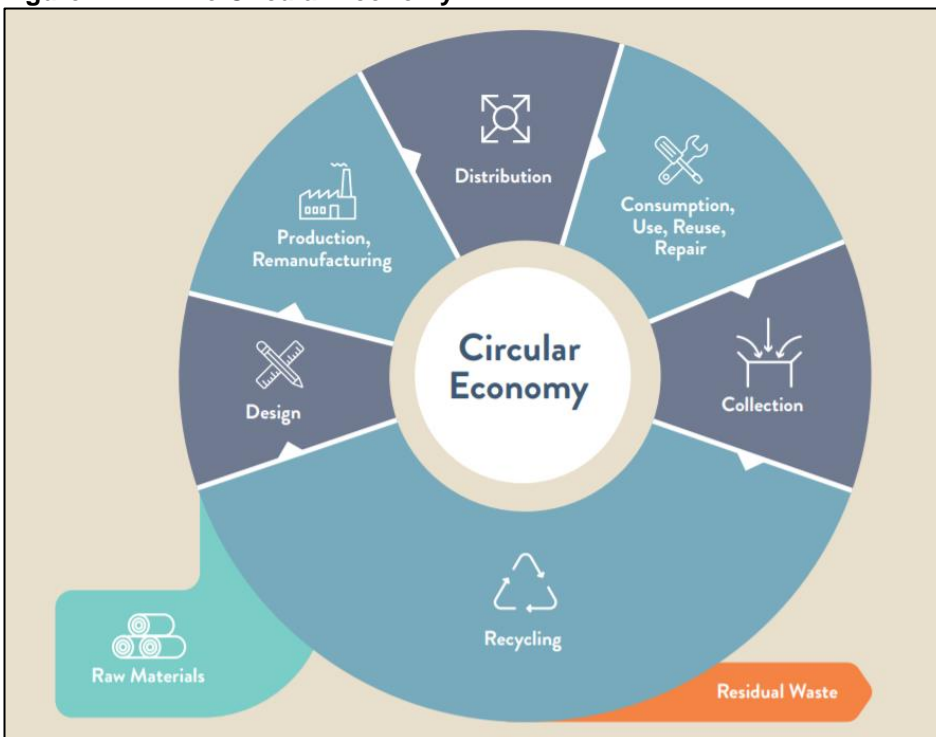
Figure 11.1 – The Waste Hierarchy (European Commission)



11.2.3 The Circular Economy

Ireland’s national waste policy is A Waste Action Plan for A Circular Economy – Ireland’s National Waste Policy 2020 – 2025. The policy, published in September 2020, is intended to move Ireland away from the traditional ‘cradle-to-grave’ model of resource use, towards a more ‘circular’ model, whereby “waste and resource use are minimised; the value of products and materials is maintained for as long as possible through good design, durability and repair; and when a product has reached the end of its life, its parts are used again and again to create further useful products” (p. 10) (Figure 17.2). By extending the time resources are kept within the economy, environmental, social and economic benefits can be realised.

Figure 11.2 – The Circular Economy



11.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

The construction and operation of the proposed development will introduce new volumes of waste into the local area in terms of the short-term generation of construction waste and the longer-term generation of domestic waste when the development is occupied.

Baseline Construction Phase

The construction of the proposed residential development will introduce new volumes of waste into the region in terms of the short-term generation of demolition waste arising from buildings and hard standing areas (under the Part 8 permission), removal of historically dumped waste at the site.

Site investigations conducted at the site have determined that soils to be excavated to facilitate the development range between Inert, Non-Hazardous and Hazardous following waste soil Classification as prescribed in *EU Council Decision 2003/33/EC*.

Baseline Operational Phase

The subject site was the formerly the St Michaels Estate which has been previously demolished and is now a brownfield site thus there is no domestic waste currently generated at the site.

11.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development is described in Chapter 2 and the following details are relevant to this chapter.

The development will comprise 578 no. apartments, community facilities (including community hub/library, creche, retail/retail services and café units), a supermarket, a public plaza fronting onto Emmet Road and the installation of a new watermain c 200m in length along Emmet Road to the junction with Tyrconnell Road/Grattan Crescent. The proposal includes works to a protected structure (8705 - Richmond/Keogh Barracks, relating to works to rubble stone boundary walls) and landscaped spaces which shall generate domestic, retail and commercial waste

11.5 POTENTIAL IMPACT/EFFECTS OF THE PROPOSED DEVELOPMENT

11.5.1 Construction Phase

The development of the subject site will initially require the stripping of top and subsoils and the excavation of ground to foundation level as well as the demolition of structures and hard-standing areas.

If construction and demolition wastes are not correctly managed in accordance with the site-specific Resource and Waste Management Plan prepared with regard to the *EPA Best Practice Guidelines for the preparation of resource management plans for construction and demolition projects, April 2021*, then construction and demolition waste streams may not be correctly segregated, or disposed of. The potential impacts on the environment of improper, or a lack of, waste management during the construction and demolition phase would be a diversion from the priorities of the waste hierarchy which would thus reduce the opportunity of re-using, recycling and recovering waste streams in addition to the potential for unauthorised dumping of construction material at unauthorised facilities. In the absence of mitigation, the effect on the local and regional environment is likely to be **long-term, significant** and **negative**.

The range of works required for the Construction Phases are summarised in Table 11.1. The expected construction wastes that will be generated throughout the course of the development are described in Table 11.3.

11.5.2 Description of Proposed Development Site Activities

The range of development works to which the Waste Management Plan will be integrated into during the design phase, construction phase and operation phase of the site are summarised in Table 11.1.

A Project Specific Resource and Waste Management Plan (RWMP) has been prepared as a stand-alone report to accompany the application.

Table 11.1 – Sequence of Construction Works

Activity Sequence	General Description
Site access and security	Set up site access point and erect site hoarding
Invasive Species	Removal of Buddleia
Historic Waste	Testing and removal of waste materials
Identification of Existing Utility Services	Set up bunting, mark location of live services, including E.S.B., Gas etc.
Facilities	Install site offices and welfare units
Compounds	Establish materials storage compound and waste management compound
Demolition	Removal of existing structures under Part 8 permission
Removal of Vegetation	Grass
Site Preparation	Soil stripping, stockpiling, export
Infrastructure installation	Drainage, Utility ducts, power, internal roads
Substructure	Foundations
Superstructure	Steel Frame
External Envelope	Place façade to superstructure
Internal Finishes	Mechanical & Electrical
External Landscaping	Hard and soft landscaping, road surfacing

Table 11.2 – Typical Construction Waste Composition

Description of Waste	%
Metals	2.2
Concrete, Brick, Tile, Gypsum	7.2
Bituminous mixtures	1.3
Mixed C&D waste	4.5
Soils & Stones	84.8
Total	100

Ref. EPA C&D Waste Statistics for Ireland November 2021.

Table 11.3 – Predicted Construction Waste Generation

Description of Waste	Tonnes to be generated
Metals	123
Concrete, Brick, Tile, Gypsum	341
Bituminous mixtures	62
Mixed C&D waste	213
Soils & Stones	52,670
Total	53,409

The calculated construction waste tonnage with the exception of soils and stones has been derived from the Building Research Establishment Environmental Assessment Method (BREEAM) which specifies that 11.1 tonnes of construction waste is generated for every 100m² of development area.

Table 11.4 – Predicted Demolition Waste Generation

Demolition Waste Type	Predicted tonnage to be produced
Concrete & Blocks	1,974
Metals	2
Asphalt	1,904
Total	3,853

Table 11.4 Figures referenced from Garland Report and Survey dated February 2021 Planning Reg. Ref. 2221/21

The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

11.5.3 Soil Excavation

There is a quantity of excavated material (c. 35,289m³) which will need to be excavated to facilitate the proposed development. A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 5 (Land and Soils). Soils have been previously classified and will require to be segregated prior to export off-site to ensure that contaminated materials are managed in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

11.1 OPERATIONAL PHASE

11.5.4 Waste Types & Quantities Operational Phase

The most recent *EPA National Waste Statistics Report for 2018, published 2020* on household waste generation states 600kg is produced per person per year. (Pandemic Years 2019-2020 not considered as biasedly higher as a result of higher than normal domestic consumption of goods and associated waste generation).

A value of 1.6kg of waste generated per person per day has been therefore assumed for the purposes of this report to estimate the volume of waste to be generated at the proposed fully occupied development as detailed in Table 11.5. Residential waste quantities in litres and m³ have been evaluated with regard to *British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice*.

Table 11.5 – Calculated domestic waste composition Residential Development

Unit	Per Day	Per Week
Litres	8,760	61,320
m ³	8.7	61

Non-Residential waste quantities have been evaluated with regard to *British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice* as detailed in Table 11.6.

Table 11.6 – Non-Domestic waste generation per week

Unit	Litres Per Week
Supermarket	11,250
5 no. Retail/Retail Services Units	4,320
2 no. Cafes	1,090
Creche	6,878
Community Hub/Library	1,000

If waste infrastructure and appropriate waste management systems are not integrated into the design and the operation of the proposed development, domestic waste will not be segregated at source or appropriately managed on-site and the operation of the development will not function in accordance with the waste management policies of Dublin City Council or comply with the waste reduction and recycling and re-use targets defined in the current *Eastern-Midlands Region Waste Management Plan 2015-2021 which is due to be updated in 2022*.

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill. In the absence of mitigation, the effect on the local and regional environment is likely to be **long-term, significant** and **negative**.

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The knock-on effect of litter issues is the presence of vermin in affected areas. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

11.5.5 Do Nothing' Scenario

Should the site not be developed for residential use it will continue not to have any impact or demand on local waste services or on the receiving environment. A vacant site may however be subject to unauthorised illegal dumping or fly-tipping as is currently the case at the subject site. Developing the site will mitigate the risk of future illegal dumping.

11.6 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

The following measures will mitigate the impact of the construction and operational phases impact on regional waste management infrastructure.

11.6.1 Construction Phase Resource and Waste Management Plan

The Resource and Waste Management Plan (RWMP) prepared by Byrne Environmental (included with the application in Appendix D Volume III of the EIAR) specifically addresses the following aspects:

Waste materials generated by construction activities will be managed according to the EPA Draft Best Practice Guidelines for the preparation of resource management plans for construction and demolition projects, April 2021. The mitigation measures contained in the CWMP will be implemented in full and form part of the mitigation strategy for the site.

- Analysis of waste arisings / material surpluses;
- Specific Waste Management objectives for the Project including the potential to re-use existing on-site materials for further use in the construction phase;
- Methods proposed for Prevention, Reuse and Recycling;
- Waste Handling Procedures;
- Waste Storage Procedures;
- Waste Disposal Procedures;
- Record Keeping.

Waste minimisation and prevention will be the primary responsibility of the Resource and Waste Manager who shall ensure the following:

- Materials will be ordered on an “*as needed*” basis to prevent over supply;
- Materials will be correctly stored and handled to minimise the generation of damaged materials;
- Materials will be ordered in appropriate sequence to minimise materials stored on site;
- Sub-contractors will be responsible for similarly managing their wastes.

11.6.2 Programme of Waste Management for Construction Works

It is proposed that the construction Contractor as part of regular site inspection audits will determine the effectiveness of the waste management statement and will assist the project manager in determining the best methods for waste

minimisation, reduction, re-use, recycling and disposal as the construction phase progresses and waste materials are generated.

11.6.3 Construction Waste Disposal Management

It is proposed that from the outset of construction activities, a dedicated and secure compound containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the active construction phase of the development site.

In order to ensure that the construction contractor correctly segregate waste materials, it is the responsibility of the site construction manager to ensure all staff are informed by means of clear signage and verbal instruction and made responsible for ensuring site housekeeping and the proper segregation of construction waste materials.

It will be the responsibility of the Resource and Waste Manager to ensure that a written record of all quantities and natures of wastes exported -off site are maintained on-site in a Waste File at the Project office.

It is the responsibility of the Resource and Waste Manager that all contracted waste haulage drivers hold an appropriate Waste Collection Permit for the transport of waste loads and that all waste materials are delivered to an appropriately licenced or permitted waste facility in compliance with the following relevant Regulations:

- *Waste Management (Collection Permit) Regulations 2007 (SI No. 820 of 2007);*
- *Waste Management (Collection Permit) Amendment Regulations 2008 (SI No. 87 of 2008);*
- *Waste Management (Facility Permit and Registration) Regulations S.I.821 of 2007 and the Waste Facility Permit under the Waste Management (Facility Permit and Registration) Amendment Regulations S.I.86 of 2008.*

Prior to the commencement of the Project, the Resource and Waste Manager shall identify a permitted Waste Contractor who shall be employed to collect and dispose of all wastes arising from the project works. In addition, the Resource and Waste Manager shall identify and all waste licensed / permitted facilities that will accept all expected waste exported off-site and will maintain copies of all relevant Waste Permits / Licences as required.

All waste soils prior to being exported off-site, have been classified utilising HazWasteOnline software using classification engine WM3.v1.1. Excess soils shall be exported off-site to appropriately permitted/licenced facilities based on their acceptance criteria.

11.6.4 On-Site Waste Reuse and Recycling Management

Construction waste material such as soils, damaged or broken concrete slabs, blocks, bricks and tiles generated that is deemed by the Project Engineer to be suitable for reuse on the Project site for ground-fill material and landscaping. This initiative shall provide a positive environmental impact to the construction phase as follows:

- Reduction in the requirement for virgin aggregate materials from quarries;
- Reduction in energy required to extract, process and transport virgin aggregates;
- Reduced HGV movements associated with the delivery of imported aggregates to the site;
- Reduced noise levels associated with reduced HGV movements;
- Reduction in the amount of landfill space required to accept C&D waste;
- Reduction in the volume of soils to be exported off-site.

11.6.5 Waste Storage Compound

A waste storage compound shall be set up on-site from the commencement of site activities. The compound shall include the following:

- Separate waste skips labelled with signage stating the nature of waste materials that can only be placed in the skips;
- Waste oils / containers shall be placed in dedicated mobile bunds units;
- Soils contaminated by accidental on-site spillages of oils / construction hydrocarbons shall be stored in clearly identified hazardous waste storage containers;
- Spill kits with instructions shall be located in the waste storage compound.

11.6.6 Soil Classification

Soils at the site have been classified by *O'Connor Sutton Cronin (Report Dated Jan 2021)* following sampling, analysis and the utilisation of the *HazWasteOnline software WM3V.1.1*.

Table 11.7 – Soil Classification Results

	A	B1	B2	C1	C2	D	D1
	Inert – Waste Permitted or Recovery Sites	Inert e.g. IMS B1	Inert e.g. IMS Landfill Inc. Limits	Non-Haz	Non-Haz Quantifiable asbestos	Hazardous	Hazardous with Asbestos >0.1%
No. of samples	11	98	30	26	1	16	1

11.6.7 Invasive Species listed on the Third Schedule of S.I. 477/2011 (as amended)

An ecological assessment of the site prepared by Enviroguide has identified the presence of Buddleia plant species on the subject site. The management of the species shall be managed by cutting Buddleia plants to a basal stump during active growth (late spring to early summer) and immediately treating the total cut surface with herbicide concentrate. Monitoring will be required and retreatment, as necessary.

11.6.8 Top-Soil Reuse

Approximately 35,289m³ of soils shall be stripped to facilitate the construction phase. Topsoil shall be retained on-site and shall be re-used for landscaping purposes.

11.6.9 Record Keeping

It is the responsibility of the Project Manager or his/her delegate that a written record of all quantities and natures of all wastes reused / recycled and exported off-site during the construction phase are maintained in a Waste File at the site project office.

The following information shall be recorded for each load of waste exported off-site:

- Waste Type EWC Code and description;
- Volume of waste collected;
- Waste collection contractor's Waste Collection Permit Number and collection receipt including vehicle registration number;
- Destination of waste load including Waste Permit / Licence number of facility;
- Description of how waste at facility shall be treated: disposal / recovery / export;
- The waste records shall be issued to Dublin City Council as required / requested.

11.6.10 Waste Management Auditing

In order to ensure that construction wastes generated during the course of the development are being effectively managed and recorded, a waste management audit shall be conducted on a routine basis by an independent waste management consultant to determine compliance with the Resource Waste Management Plan.

11.6.11 Operational Phase Waste Management Plan

An Operational Waste Management Plan (OWMP) has been prepared as a stand-alone report to accompany the Part 10 application and is contained in Appendix D Volume III of the EIAR. The mitigation measures contained in the

OWMP will be implemented in full and form part of the mitigation strategy for the site. The OWMP has been prepared to demonstrate how the required infrastructure will be incorporated into the design and operational management of the development to ensure that domestic wastes will be managed and monitored with the objective of maximising the quantity of waste segregated at source and maximising the volume of clean recyclable materials generated by the residents of the development.

The Goal of the OWMP is to achieve a compliance with the current *Eastern-Midlands Region Waste Management Plan* which defines the following Waste Targets:

- 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan.
- Achieve a recycling rate of 50% of managed municipal waste .
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill.

The Operational Waste Management Plan has been prepared with regard to the strategy, policy and objectives and design standards of the Draft Dublin City Council Development Plan 2022-2028.

The Operational Waste Management Plan is defined by the following stages of waste management for both the residential and commercial aspects of the development:

- Stage 1 Occupier Source Segregation;
- Stage 2 Occupier Deposit and Storage;
- Stage 3 Bulk Storage and On-Site Management;
- Stage 4 On-site treatment and Off-Site Removal;
- Stage 5 End Destination of wastes.

The OWMP has been prepared with regard to *British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice* which provides guidance on methods of storage, collection, segregation for recycling and recovery for residential building.

The apartments which will include a 3 - bin waste segregation at source system together with the communal waste storage areas have been designed with regard to *Section's 4.8 and 4.9 Refuse Storage of The Department of Housing, Planning and Local Government – Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities. 2020.*

The proposed residential development shall be designed and managed to provide residents with the required waste management infrastructure to minimise the generation of un-segregated domestic waste and maximise the potential for segregating and recycling domestic waste fractions.

The **Objective** of the OWMP is to maximise the quantity of waste recycled by residents by providing sufficient waste recycling infrastructure, waste reduction initiatives and waste collection and waste management information services to the residents of the development.

The **Goal** of the OWMP is to achieve a residential recycling rate of 50% of managed municipal waste by 2020 (and future targets in subsequent Regional Waste Management Plans).

All residential units will have a 3-bin system (non-recyclable, organic and recyclable) in each kitchen to encourage residents to segregate waste at source.

Apartment residents will be provided with waste recycling and waste disposal information by the development's Facility Management Company who will be responsible for providing clean, safe and mobility impaired accessible communal waste storage areas for the apartment blocks.

The Facility Management Company shall maintain a register of all waste volumes and types collected from the development each year including a break-down of recyclable waste and where necessary, shall introduce initiatives to further encourage residents to maximise waste segregation at source and recycling. They shall also provide an annual bulky waste and WEEE and waste battery collection service for all residents.

The development shall be designed to provide adequate domestic waste storage areas for each apartment blocks. This will promote the appropriate segregation at source of domestic generated waste from all residential units at the

development. Communal waste bin storage areas shall be designed in a manner to ensure that appropriate signage for the correct disposal and recycling of waste is available for residents.

11.7 PREDICTED RESIDUAL IMPACTS

11.7.1 Construction Phase

The management of wastes generated during the construction of the proposed development will be in accordance with a Site-Specific Construction Phase Waste Management Plan. With regard to how it has been demonstrated how construction wastes will be managed through design, management and waste reduction and recycling initiatives at the proposed development, it is predicted that the impact of the construction phase of the development will not have an adverse impact on the receiving environment, existing material assets and local and regional waste management services.

The Table below summarises the identified likely significant effects of the proposed development during the construction phase post application of mitigation measures.

Table 11.8 – Summary of Construction Phase Likely Significant Effects with Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Regional Construction Waste Infrastructure	Negative	Not Significant	Regional	Likely	Short-Term	Residual

11.7.2 Operational Phase

The development shall be designed to provide adequate domestic waste infrastructure and storage areas for all apartments. This will promote the appropriate segregation at source of domestic generated waste from all residential units at the development and thus reduce the potential for the generation of mixed un-recyclable domestic waste streams.

The Table below summarises the identified likely significant effects of the proposed development during the operational phase post application of mitigation measures.

Table 11.9 – Summary of Operational Phase Likely Significant Effects with Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Regional Construction Waste Infrastructure	Negative	Not Significant	Regional	Likely	Long-Term	Residual

11.7.3 'Worst-case' Impacts

There are no worst-case impacts associated with the proposed development as sufficient capacity and waste storage space will be provided for both the construction and operational phases. The implementation of the Resource and Construction Waste Management Plan and the Operational Waste Management Plan shall ensure all wastes are controlled and monitored thus reducing the impact on the receiving environment and Regional waste management infrastructure.

11.8 CUMULATIVE IMPACTS

This section considers the cumulative waste impact of the proposed development in conjunction with future and current development in the vicinity of the subject site, relating to an adjoining 52 unit older persons development to the east as well as Reg. Ref. ABP-303435-19 relating to a permitted SHD application located the Former Dulux Factory Site, Davitt Road, Dublin 12 for the construction of 265 Build to Let Apartments.

The cumulative waste impact of the proposed residential development will place a greater demand on local waste management services and providers. However with regard to the requirements of all new developments to integrate waste segregation and recycling infrastructure into the design of residential units, the impact on regional waste management infrastructure will be minor.

Other new residential developments in the area will be similarly required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management.

The legislative and best practice mitigation measures set out in this chapter would also be applicable to these projects and the implementation of these measures will ensure that there are no negative cumulative impacts on the environment from the management of waste materials from these projects with the proposed development, should all projects proceed.

The compliance requirements and mitigation measures set out in this chapter would be applicable to the subject development and together with the implementation of the mitigation measures set out in this chapter in respect of the proposed development will ensure that there are no negative cumulative impacts on the environment from the management of waste materials, during the operational phase.

11.9 MONITORING

11.9.1 Construction Phase Waste Monitoring

The Construction Manager will maintain a written record of all quantities and types of construction wastes generated, reused / recycled and exported off-site during the construction phase.

The following information shall be recorded for each load of waste exported off-site:

- Waste Type EWC Code and description.
- Volume of waste collected.
- Waste collection contractor's Waste Collection Permit Number and collection receipt including vehicle registration number.
- Destination of waste load including Waste Permit / Licence number of facility.
- Description of how waste at facility shall be treated i.e. disposal / recovery / export

Waste Management Auditing

In order to ensure that construction wastes generated during the course of the development are being effectively managed and recorded, a waste management audit shall be conducted on a routine basis to determine compliance with the Construction Waste Management Plan.

11.9.2 Operational Phase Waste Monitoring

The Facility Management Company shall prepare an annual report for the Local Authority and residents of the development on the quantities of waste generated within the development to demonstrate how waste reduction and recycling targets are being achieved with regard to the targets defined in the current Eastern-Midlands Region Waste Management Plan.

11.10 SUMMARY OF MITIGATION & MONITORING

The Table below summarises the proposed construction phase mitigation and monitoring measures.

Table 11.10 – Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Additional construction Waste generation	Implementation of Site-Specific Resource & Waste Management Plan	Recording of all waste generated and exported off-site Waste auditing

The Table below summarises the proposed operational phase mitigation and monitoring measures.

Table 11.11 – Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Additional domestic waste generation	Implementation of Site-Specific Operational Waste Management Plan	Recording of all waste generated.

11.11 INTERACTIONS

The identified interactions between the management of waste arisings during both the construction and operational stages are as follows;

- Population & Human Health, management of waste in the construction and operational phase to mitigate nuisance.
- Land & Soils, excavation to facilitate the development.
- Traffic, specifically movement of waste associated with the construction stage.

11.12 REINSTATEMENT

No reinstatement is required.

11.13 REFERENCES AND SOURCES

Waste Management Act 1996, 2001

Waste Management (Collection Permit) Regulations 2007 (SI No. 820 of 2007);

Waste Management (Collection Permit) Amendment Regulations 2008 (SI No. 87 of 2008);

Eastern-Midlands Region Waste Management Plan 2015-2021;

European Communities (Waste Directive) Regulations 2011;

Dublin City Development Plan 2016-2022

Draft Dublin City Development Plan 2022 – 2028;

Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities(2018 Department of Housing, Planning and Local Government, Section's 4.8 and 4.9 Refuse Storage;

British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice which provides guidance on methods of storage, collection, segregation for recycling and recovery for residential building.

12.0 MATERIAL ASSETS - UTILITIES

12.1 INTRODUCTION

This chapter of the Environmental Impact Assessment Report (EIAR) considers & assesses the potential impacts on local utilities in regard, to the proposed scheme. Measures to mitigate any likely significant negative impacts of the proposed scheme are reviewed and analysed.

12.2 METHODOLOGY

The following section outlines the legislation and guidelines considered, and the adopted methodology for preparing this chapter.

12.2.1 Guidelines

The following guidelines have been considered in the preparation of this report:

- *European Union (Planning & Development) (Environmental Impact Assessment) Regulations 2018;*
- *Planning and Development Act 2000 (as amended);*
- *Planning and Development Regulations 2001 (as amended);*
- *Directive 2011/92/EU;*
- *Directive 2014/52/EU;*
- *Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licensing Systems – Key Issues Consultation Paper (2017; DoHPCLG);*
- *Preparation of guidance documents for the implementation of EIA directive (Directive 2011/92/EU as amended by 2014/52/EU) – Annex I to the Final Report (COWI, Milieu; April 2017);*
- *Guidelines on the information to be contained in environmental impact assessment reports, EPA, 2022*
- *Environmental Impact Assessment – Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018; DoHPLG); and*
- *Guidance for Consent Authorities regarding Sub-threshold Development (2003; DoEHLG).*
- *Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)(2017)*
- *Greater Dublin Strategic Drainage Study (2005)-Fingal County Council, Dublin City Council, Dun Laoghaire-Rathdown Count Council, South Dublin County Council, Wicklow County Council, Kildare County Council, Meath County Council*
- *The Greater Dublin Region Code of Practice for Drainage Works (Version V6-0) – Fingal County Council, Dublin City Council, Dún Laoghaire-Rathdown County Council, South Dublin County Council, Wicklow County Council, Kildare County Council, Meath County Council*
- *I.S. EN12056: 2000 Gravity Drainage Systems inside Buildings (2000) – National Standards Agency Ireland*
- *I. S. EN752: 2017 Drain & Sewer Systems outside Buildings (2017) – National Standards Agency Ireland*
- *Code of Practice for Water Infrastructure (2020) – Irish Water*
- *Code of Practice for Wastewater Infrastructure (2020) – Irish Water*
- *Wastewater Treatment Manuals (1999) – Environmental Protection Agency*
- *Control of Water Pollution from Construction Sites (2002) – Construction Industry Research and Information Association*
- *Environmental Handbook for Building and Civil Engineering Projects (2000) – Construction Industry Research and Information Association*

12.2.2 Study Area

The study area consists of the site outlined in red in Figure 12.1 together with areas in its immediate vicinity.

Utility record information for the existing infrastructure were obtained from the following:

- Dublin City Council
- Irish Water;
- Electricity Supply Board Networks;
- Gas Networks Ireland;

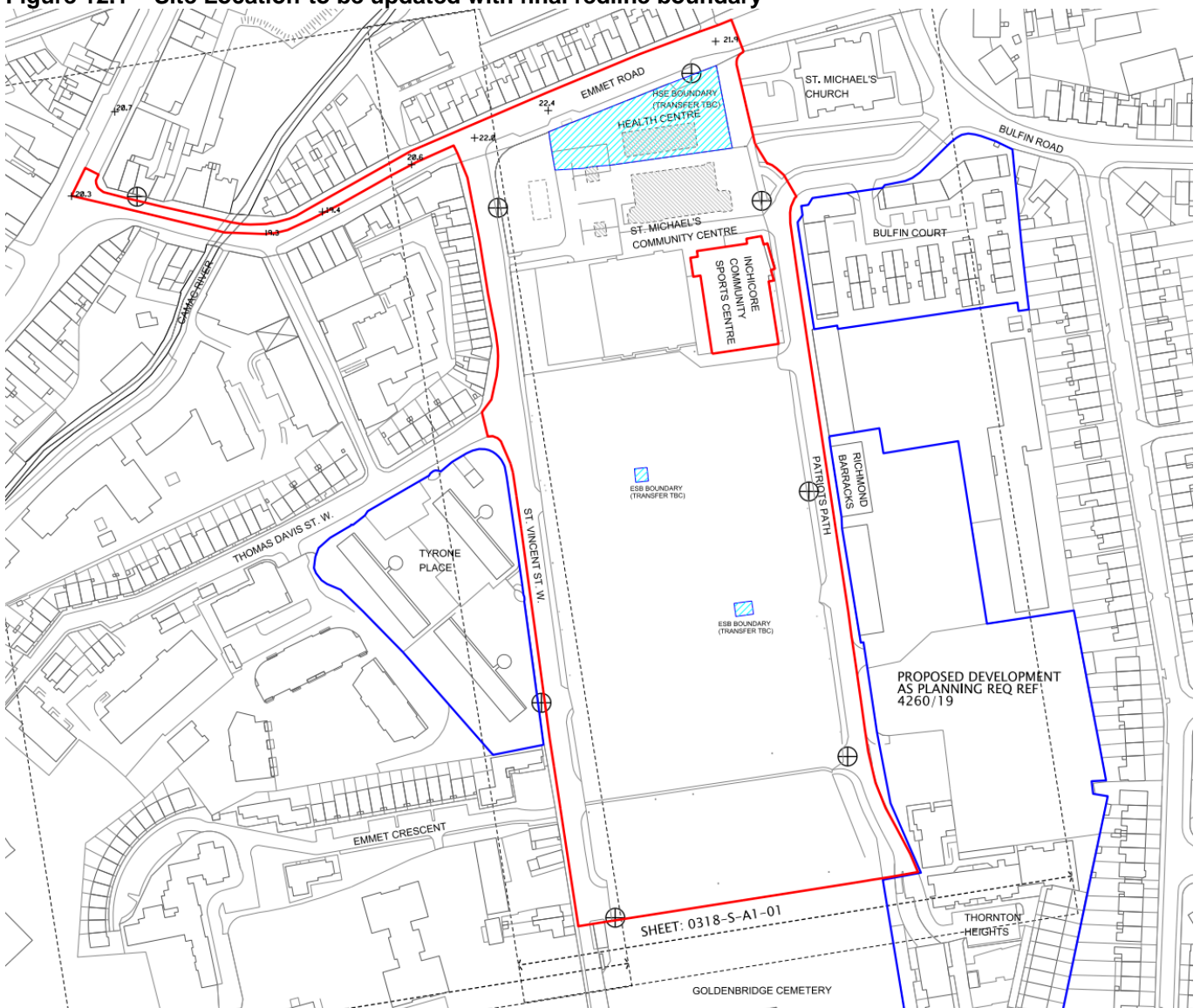
- Telecommunications Utility Providers.

Information on all services is supplemented with information obtained from site topographical survey and site inspections.

In order to further determine the existing utilities environment, an Underground Utilities Survey was carried out by Apex Surveys Ltd. At the site between August and October 2020. The survey methods adopted included manhole surveys, ground penetrating radar surveys and surveys of visible services using GPS/Total Station. The results provide further clarification as to the existence and location of utilities.

A desk study of records received in digital format from the various utility companies/authorities, survey information and supplementary sources was undertaken. Consultations with the utility companies/authorities were conducted in order to identify their particular requirements during construction and for permanent arrangements.

Figure 12.1 – Site Location-to be updated with final redline boundary

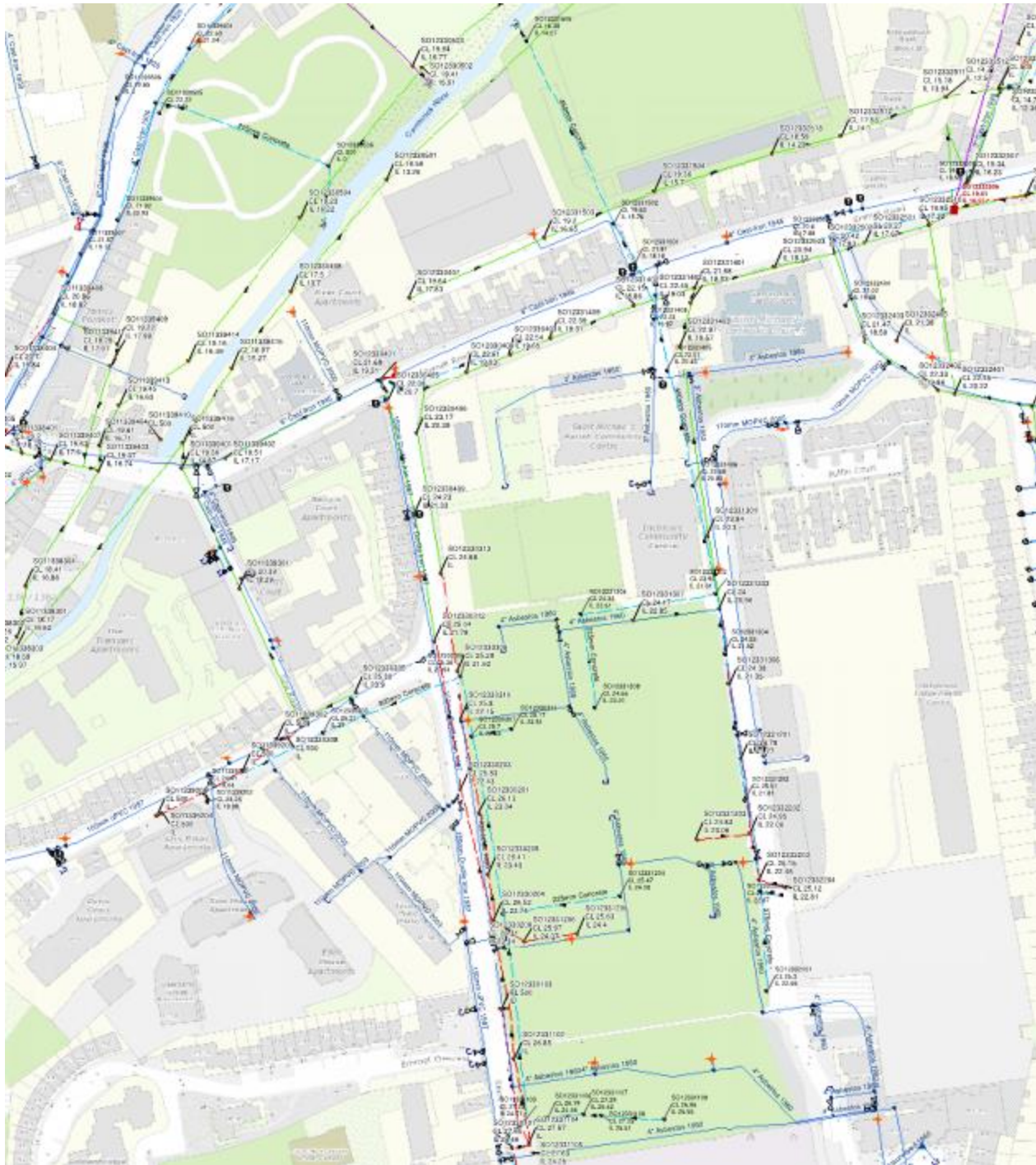


12.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

12.3.1 Existing Storm Water Infrastructure

The site and its surroundings are well served by dedicate/separate storm drainage network, as indicated in Figure 12.2 below.

Figure 12.2 – Irish Water Record Drawings



Two main storm drains are identified serving the site. The first is a 300mm diameter concrete sewer which travels along the western boundary of the site before travelling in a westerly direction along Thomas Davis Street West. The

Irish Water record drawings indicate that this sewer previously gathered storm drainage from St Michaels Estate. However, the drawings from the demolition of St Michaels Estate and the results of the GPR survey indicate that these connections may have been removed. It is noted that there are discrepancies between the findings of the GPR survey and the record drawings in terms of the plan location and alignment of this sewer-this will need to be further reviewed/verified on site. It is also noted that the sewer passes onto the site in a number of locations. Thus, a permanent diversion of same may be required to facilitate the development.

The second dedicated storm sewer is a 375mm diameter concrete sewer which travels along Patriots Path to the eastern boundary of the site This sewer later becomes a 450mm diameter sewer before travelling under Emmet Road and to the rear of Richmond Park to discharge to the Camac River. Again, the Irish Water Record drawings indicate that this sewer previously gathered storm drainage from St Michaels Estate. However, the drawings from the demolition of St Michaels Estate and the results of the GPR survey indicate that these connections may have been removed.

12.3.2 Existing Foul Water Infrastructure

The proposed development site is well served by foul/combined sewers, as identified on the Irish Water Records reproduced as Figure 12.2 and verified by GPR/Utilities survey.

Foul sewers are located to both the western and eastern boundaries of the site. There are 2no. foul sewers located along St Vincent Street West. The sizes are not identified on the Irish Water records, but the larger sewer been determined as a 375mm diameter sewer becoming a 1600mm brick arch sewer. The second sewer is identified as a 300mm diameter combined sewer that travels under the grounds of the Pigeon Club onto Emmet Road. This has been labelled as a storm sewer on the utilities survey which may indicate the foul flow into same would have been from the St Michaels Estate buildings.

The foul sewer to the east of the site runs along Patriots Path. This consists of a 225mm diameter travelling in a northern direction along the eastern boundary of the site. The sewer serves a number of adjoining developments including Richmond Barracks, Inchicore Primary Care Centre, Inchicore Community Sports Centre, Inchicore, St Michaels Community Centre and Eve Tuisicint Health Centre amongst others. Both the record drawings and utilities survey confirm that this sewer becomes a combined sewer before discharging to the combined sewer along Emmet Road.

12.3.3 Existing Potable Water Infrastructure

There are a number of existing watermain services identified on the Irish Water Record drawings as serving the Emmet Road site. These include:

- 3-inch asbestos pipe supply to Eve Tuisicint Health Centre and Pigeon Club grounds;
- 3-inch asbestos pipe supply to Saint Michaels Community Centre and Inchicore Community Sports Centre;
- 4-inch asbestos pipe supply to northern portion of the original St Michaels Estate building. This main links a 4-inch asbestos pipe main on St Vincent Street West and a 3-inch asbestos pipe supply on Patriots Path;
- 4-inch asbestos pipe supply to central portion of the original St Michaels Estate building. This main links a 4-inch asbestos pipe main on St Vincent Street West and a 3-inch asbestos pipe supply on Patriots Path;
- 2no. 4-inch asbestos pipe feeds on the southern portion of the site. Again, these mains link watermains on St Vincent Street West and Patriots Path. Sections of these mains also supply Thornton Heights development.

In addition to the above, the record drawings indicate a separate 110mm MOPVC supply along Bulfin Road and Patriots Path. This main is indicated to supply Inchicore Primary Care Centre and/or Richmond Barracks

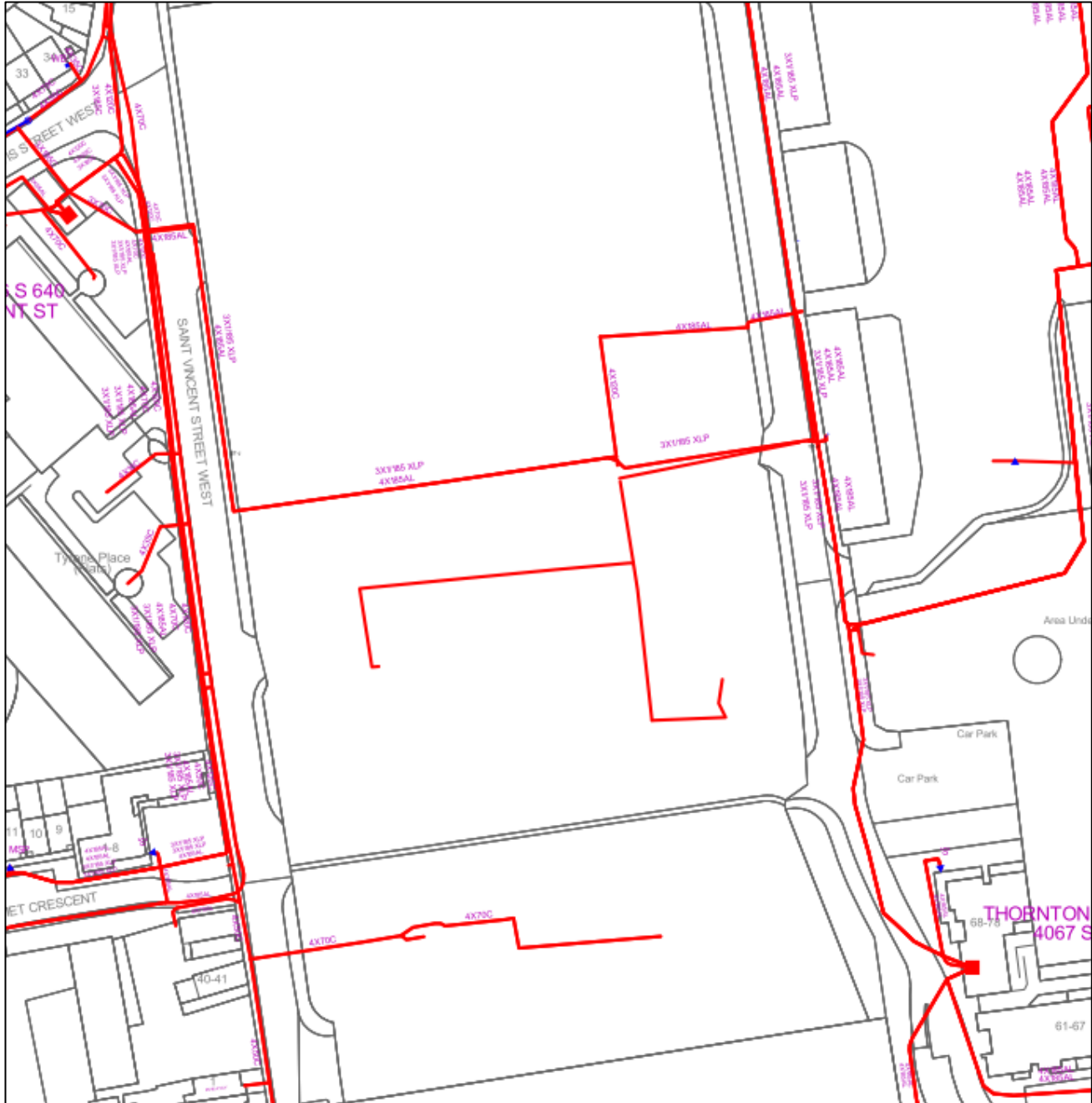
It is noted that the demolition drawings for St Michaels Estate indicate that a number of the above watermains may have been removed as part of the demolition works.

12.3.4 Existing ESB Infrastructure

Electricity Supply Board (ESB) existing local services infrastructure maps indicate that there should be sufficient capacity in the local network to accommodate the new development. However, the local services maps do also indicate a significant number of existing services crossing the site. These include original service connections from a substation located near Thomas Davis Street West which cross the site to Richmond Barracks and Inchicore

Primary Care Centre. Elements of these services were also identified on the utilities survey. These services need to be discontinued and/or re-routed by ESB. An application will be made, by IN2, at a later stage for the new Connection & diversion works coordinated with the agreed site layout.

Figure 12.3 – Existing ESB Networks Local Services Map



12.3.5 Existing Gas Infrastructure

Gas Networks Ireland (GNI) existing local services infrastructure maps indicate that there should be sufficient capacity in the local network to accommodate the new development. However, the local services maps do also indicate a significant number of existing services crossing the site. These include original service connections to St Michaels Estate but also assumed live feeds to Inchicore Primary Care Centre and Thornton Heights. Elements of these services were also identified on the utilities survey. These services need to be discontinued and/or re-routed by GNI. An application will be made, by IN2, at a later stage, for the new Connection & diversion works coordinated with the agreed site layout.

Figure 12.4 – Existing Gas Local Services Map

12.3.6 Existing Telecommunications Infrastructure

Eir existing local services infrastructure maps indicate that there should be sufficient capacity in the local network to accommodate the new development. However, the local services maps do also indicate a significant number of existing services crossing the site. These include original service connections from Thomas Davis Street West and run across the site adjacent to the Inchicore Community Sports Centre. Elements of these services were also identified on the utilities survey. These services need to be discontinued and/or re-routed by Eir. An application will be made, by IN2, at a later stage for the new Connection & diversion works coordinated with the agreed site layout.

Figure 12.5 – Existing Telecoms Local Services Map



12.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

12.4.1 Surface Water Drainage

It is proposed to separate the surface water and wastewater drainage networks, which will serve the proposed development, and provide independent connections to the local surface sewer network and local wastewater sewer network respectively. The development will discharge treated and attenuated (to greenfield equivalent rate) rainfall runoff to the adjacent public surface water networks, that discharge to the River Camac.

The site and its surroundings are well served by dedicated/separate storm drainage network. Two main storm drains are identified serving the site. The first is a 225mm-diameter concrete sewer which travels along the western boundary of the site. This sewer later becomes a 300mm-diameter sewer before travelling in a westerly direction along Thomas Davis Street West. The Irish Water records drawings indicate that this sewer previously gathered storm drainage from Saint Michael's Estate. However, the drawings from the demolition of Saint Michael's Estate and the result of the GPR survey indicate that these connections may have been removed. It is also noted that the sewer passes onto the site in a number of locations. Thus, a permanent diversion of same is proposed to facilitate the development.

The second dedicated storm sewer is a 375mm-diameter concrete sewer which travels along Saint Michael's Estate to the eastern boundary of the site. This sewer later becomes a 450mm-diameter sewer before travelling under Emmet Road and to the rear of Richmond Park to discharge to the Camac River. It is also noted that the sewer passes onto the site in a number of locations. Thus, a permanent diversion of same is proposed to facilitate the development.

The overall development is to be separate into two individual surface water catchments based on the natural topography of the development site and due to the proposed mix of uses of the proposed development:

- Residential catchment-located to the south of the site and consisting of Blocks A and B
- Commercial catchment to the north of the site Commercial Mixed Use, Community Hub and Library

It is proposed that both catchments will drain to the diverted surface water sewer along Patriots Path. The residential catchment will be connected to the 375mm diameter section of sewer in front of the Primary Care Centre. The commercial catchment will connect to the 450mm diameter sewer in the north-eastern corner of the development.

Sustainable Drainage Systems are to be provided, and these are discussed in more detail in *Section 3.5 of the Engineering Service Report*, with discharge rates from site being restricted to the greenfield equivalent runoff rate, for design rainfall events up to, and including, the 1% AEP, in accordance with the Dublin City Development Plan and the GSDS.

The development's new surface water networks are to typically comprise a gravity pipe network, with significant Sustainable Drainage Systems implemented, -please refer to the Engineering Services Report, B967-OCSC-XX-XX-RP-C-0006

The typical traditional and Sustainable Drainage Systems (SuDS) provided, all of which have been designed in accordance with CIRIA C753, the SuDS Manual, and the design guidance material listed in Section 2 of this report, are listed and detailed in order of general sequence within the drainage network, as follows:

- Pervious Paving
- Green Roofs
- Trapped Road Gullies
- Filter Drains
- Underground Pipe Network
- Silt Traps
- Cellular Storage systems, with interception
- Bio Retention / Detention ponds
- Outlet Protection
- Flow Control Device (to control run-off at greenfield run-off rate of 5l/s/ha or 19l/s for the site)
- Oil Separator

Refer to the Engineering Services Report, B967-OCSC-XX-XX-RP-C-0006 for further detail on each SuDS measure mentioned above.

The overall surface water drainage system, serving both catchments in the proposed development, is to consist of a gravity sewer network that will convey runoff from the roofs and paved areas to the outfall manhole. The new gravity networks will discharge a controlled attenuated flow rate to both the existing public network (southern catchment) and the open ditch / stream at the north-western corner of the site (northern catchment).

The proposed piped network has been designed in accordance with BS EN 752 and all new infrastructure is to be compliant with the requirements of the GSDS and the GDR COP for Drainage Works, with minimum full-bore velocities of 1.0 m/s achieved throughout.

All main surface water carrier pipes have been sized to ensure no surcharging of the proposed drainage network for rainfall events up to, and including, the 1 in 5-year ARI event.

Each catchment is to attenuate its own rainfall runoff, prior to discharging to the main development network. The primary function of the attenuation systems will be to temporarily store excessive rainfall runoff, during significant

rainfall events, due to the restricted discharge rates (to greenfield equivalent runoff rates) from the development outfalls.

Attenuation is to be provided in the form of a cellular storage under the hard landscaped areas, prior to discharging the attenuated flows to the development's main surface water network.

A minimum total storage volume of 2,650 m³ is to be provided as part of the proposed development, which is spread across a number of lined cellular systems and open ponds.

All attenuation systems have been designed to temporarily store the surface water runoff for design rainfall events up to, and including, the 1% AEP (1-100 year flood event) with a 10% increase in rainfall intensity, along with the associated integrated surface water drainage network.'

Please refer to OCSC drawing B967-OCSC-ZZ-GF-DR-C-0500 for detail on the proposed surface water drainage layouts.

12.4.2 Foul Drainage

The proposed development is to be served by a gravity wastewater drainage network ultimately discharging to the existing wastewater sewers located at the eastern boundary of the site.

The foul sewer to the east of the site runs along Saint Michael's Estate. This consists of a 225mm-diameter travelling in a northern direction along the eastern boundary of the site. The sewer serves a number of adjoining developments including Richmond Barracks, Inchicore Primary Care Centre, Inchicore Community Sports Centre, Saint Michael's Parish Community Centre and Eve Tuiscint Health Centre amongst others. Both the record drawings and utilities survey confirm collaborate that this sewer becomes a combined sewer before discharging to the combined sewer along Emmet Road.

It is proposed that the existing sewer be diverted slightly to the east to facilitate the proposed development.

It is proposed to separate the wastewater and surface water drainage networks, which will serve the proposed development, and provide independent connections to the adjacent local wastewater and surface water sewer network infrastructure, respectively. Refer to *Section 3 of the Engineering Services Report* for details of the proposed surface water drainage design strategy.

The overall development is to be separated into three individual gravity wastewater catchments based on the natural topography of the development site and due to the proposed mix of uses of the proposed development:

- Southern Residential Catchment-consisting of Block A
- Northern Residential Catchment-consisting of Block B
- Commercial Catchment – consisting of Commercial Mixed Use, Community Hub and Library

Connections to the diverted 225mm diameter sewer are to be provided at 3 separate locations along Patriots Path.

The envisaged peak flow from the proposed development is 10l/s.

The proposed wastewater network is designed in accordance with the *Irish Water's Code of Practice for Wastewater Infrastructure (Revision 2 – July 2020)*.

Please refer to OCSC drawing B967-OCSC-ZZ-GF-DR-C-0500 for detail on the proposed foul drainage layouts.

12.4.3 Water Supply

There are a number of existing watermain services identified on the Irish Water Record drawings as serving the Emmet Road site. The primary existing watermain is a 150mm PVC main along St Vincent Street West which is fed from a 6-inch ductile iron main along Emmet Road. There are a number of smaller size mains which cross the site-these would have served the previous St Michaels Estate development on the site. The proposed development will require the decommissioning of these watermains within the footprint of the proposed new structures together with diversions of existing mains crossing the site.

It is proposed that all connections for the proposed development be from the existing 150mm diameter main along St Vincent Street West. 3no. separate connections are proposed with:

- 1no. connection serving Block A
- 1no. connection serving Block B
- 1no. connection serving Commercial Mixed Use, Community Hub and Library

A pre-connection enquiry has been submitted to Irish Water and a Confirmation of Feasibility subject to upgrades has been received. It is required that an approximate 180m length of the 6-inch watermain along Emmet Road be upgraded to a 200mm diameter pipe to facilitate the proposed development.

The envisaged peak water demand for the proposed development is 18l/s.

Please refer to OCSC drawing B967-OCSC-ZZ-GF-DR-C-0550 for detail on the proposed watermain layouts.

12.4.4 ESB Power

The development will require diversion of existing live underground services crossing the site and removal of redundant services which served previous developments on the subject site. All proposed power cables within the development will be underground or internal within the building. The estimated maximum demand for the proposed development is in the region of 2.7MVA. A total of 6no. ESB sub-stations will be constructed within the subject site to serve the proposed development. The final number of substations will be confirmed by the ESB once the ESB application has been submitted.

12.4.5 Gas

The development will require diversion of existing live underground services crossing the site and removal of redundant services which served previous developments on the subject site. There are no proposals to connect to the gas supply to serve the development with alternative means of heating proposed.

12.4.6 Telecommunications

The development will require diversion of existing live underground services crossing the site and removal of redundant services which served previous developments on the subject site. Any telecommunications networks in the proposed development will consist of cables in underground ducts or internally within the building. New connections will be provided to the new comms room location within each block *via* ducting connections to the existing on-street network.

12.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

12.5.1 Construction Phase

Surface Water Drainage

Due to the absence of natural watercourses and surface water sewers in the vicinity of the site, it is expected that surface water runoff during construction would be discharged to local surface drainage network, subject to the conditions of a discharge licence from the Local Authority.

Surface water runoff during construction activities may contain increased silt levels or become polluted from construction activities. Waterborne silt can arise from dewatering excavations, exposed ground, stockpiles and site roads. Construction materials such as concrete and cement are alkaline and corrosive and can cause pollution in watercourses. The development will require the removal of topsoil and earthworks. Such works could potentially cause deoxygenation of water in the receiving watercourses, the gills of fish to become obstructed with waterborne silt and aquatic plants and invertebrates to be smothered by settled silt, limiting exposure to sunlight and oxygen. Heavy siltation or grit in the surface water runoff would lead to maintenance issues for the receiving gravity sewerage network.

It is noted that the proposed development requires some diversions of existing live sewers crossing the site. These works involve physical works to existing drains serving the local area and as such have the potential to lead to a temporary loss in service if not undertaken correctly.

In the absence of mitigation measures, these potential impacts are considered to be negative, significant and temporary.

Foul Drainage

During the construction phase, welfare facilities for construction personnel will be located on site. Foul effluent from these facilities will be discharged to the sewerage system at a location and at a flow rate subject to the conditions of a discharge licence from Irish Water. Discharge from the excavated areas could potentially lead to siltation, surcharge and flooding within the sewerage system. Effluent from the welfare facilities could potentially lead to pollution of watercourses and flooding within the sewerage system.

It is noted that the proposed development requires some diversions of existing live sewers crossing the site. These works involve physical works to existing drains serving the local area and as such have the potential to lead to a temporary loss in service if not undertaken correctly.

In the absence of mitigation measures, these potential impacts are considered to be negative, significant and temporary. Compliance with the conditions of the discharge licence will effectively mitigate potential risks to the sewerage system.

Water Supply

During the construction phase, welfare facilities for construction personnel will be located on site. These welfare facilities will lead to an increase in demand for potable water. Supply from the public water mains will be subject to the conditions of a connection agreement with Irish Water. The increase in demand for potable water could potentially lead to a drop in pressure in the existing mains and a resulting reduction in service to existing customers.

It is noted that the proposed development requires an upgrade of the watermain in Emmet Road to a 200mm diameter main as well as some diversions of existing live mains crossing the site. These works involve physical works to existing water mains serving both the local and wider area and as such have the potential to lead to a temporary loss in service if not undertaken correctly.

In the absence of mitigation measures, these potential impacts are considered to be negative, significant and temporary. Compliance with the conditions of the connection application will effectively mitigate potential risks to the public water mains network.

Electricity Supply

During the construction phase, the contractor could apply to ESB for a supply to provide for temporary site lighting, power and security, resulting in an increase in demand on the existing network. This increase in demand could potentially lead to temporary outages in electricity supply in the vicinity of the subject site.

It should be noted that the proposed development necessitates some diversions of existing live services that cross the site. These works involve physical work on existing electricity cables serving the local area and, as such, have the potential to cause a temporary loss of service if not carried out properly.

In the absence of mitigation measures, these potential impacts are negative, significant and temporary. However, the demand during the construction phase will be relatively small scale and it is expected that ESB will make provision to accommodate increase in demand by providing a temporary substation that will be used to provide power to the site during construction.

Gas Supply

During construction of the proposed development and diversion/removal of existing gas mains crossing the site, there is a potential for temporary loss of gas supply to surrounding areas to facilitate the diversion/removal works. In the absence of mitigation measures, these potential impacts are considered to be negative, slight and brief / temporary.

Telecommunications

During construction of the proposed development, the diversion of existing telecommunication ducting and the installation of telecommunications connections, there is a potential for temporary loss of service to surrounding areas. In the absence of mitigation measures, these potential impacts are considered to be negative, slight and temporary. The connection to the telecommunications network will be managed by utility service providers.

12.5.2 Operational Impacts

Surface Water Drainage

The proposed development an increase in proposed hardstanding with the change from a green/brownfield site to a fully developed site with a mixture of roofs, hardstanding and soft landscaped areas.

In the absence of any mitigation measures discussed in section 12.6 below, the impacts on surface water discharge from the site could be considered to be negative, significant and permanent.

Foul Drainage

The proposed development will increase the quantity of foul drainage discharging to receiving foul sewerage network. The envisaged peak flow from the proposed development is 10l/s.

There is the possibility that new wastewater sewers would leak, allowing wastewater to leak out of the sewers, potentially causing contamination of groundwater and surface waters in the area.

In the absence of mitigation measures, these potential impacts are considered to be negative, moderate and permanent. However, all pipes will be tested prior to allowing wastewater effluent to discharge to them, in accordance with the requirements of Irish Water.

Water Supply

The proposed development will be supplied via an upgrade to the existing watermain infrastructure along Emmet Road. This upgrade has been advised by Irish Water as being required to facilitate the proposed development but is ultimately likely to provide greater long term capacity in the local watermain system. Therefore, the impact of the proposed development with the upgrade would be expected to be positive, moderate and permanent.

Electricity Supply

The proposed development will increase the demand on the electricity supply system. The proposed development incorporates 6no. ESB substations which are provided, in consultation with ESB Networks, to accommodate the development. Therefore, the impact of the proposed development on the electricity supply network is expected to be negative, slight, and permanent.

Gas Supply

The proposed development will not increase the demand on the gas supply network and thus the impact is considered to be neutral, slight and permanent.

Telecommunications

The proposed development will increase the demand on the telecommunications systems. The increase in demand could potentially lead to a reduction in the level of service to existing customers. In the absence of mitigation measures, these potential impacts are considered to be negative, slight and permanent.

12.5.3 'Do-nothing' scenario

If the proposed development were not undertaken, it is expected that there would be no change on the subject site and therefore no impact on surface water drainage, foul drainage, water supply and other utilities arising from the subject site.

Surface Water Drainage

In the absence of this proposed development, surface water runoff from the existing hardstanding portions of the development site would continue unattenuated.

Foul Drainage

In the absence of this proposed development, wastewater flow from the existing buildings on site would continue to discharge to the receiving sewerage network. However, there would be no increase in wastewater

Water Supply

In the absence of this proposed development, water demand from the site would continue to be supplied from the existing local watermain network in the immediate vicinity of the site. There would be no increase in capacity to the local system as the upgrade of the main along Emmet Road would not take place.

Electricity Supply

In the absence of this proposed development, there would be no change to the existing electricity supply network.

Gas Supply

In the absence of this proposed development, there would be no change to the existing gas supply network.

Telecommunications

In the absence of this proposed development, there would be no change to the existing telecommunications network.

12.6 MITIGATION MEASURES

12.6.1 Construction Mitigation

Surface Water Drainage

The Contractor will be required to prepare and implement a Surface Water Management Plan that ensures avoidance and minimisation of effects. Surface water storage in excavations may be directed to on-site settlement ponds, where silt removal will be facilitated prior to discharge off site at a controlled rate. Periodic testing of the surface water discharge may also be undertaken. The Surface Water Management Plan will include the relevant mitigation contained in the EIA and CEMP included with the application.

If concrete mixing is carried out on site, the mixing plant will be sited in a designated area with an impervious surface. To minimise any impact on the water environment from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas or chemical storage containers.

Foul Drainage

Any construction phase discharge to the wastewater sewerage infrastructure shall comply with the conditions of a Discharge Licence from Irish Water. To reduce the risk of defective or leaking sewers, all new sewers will be pressure tested and CCTV surveyed to ascertain any possible defects. Such defects, if they arise, would be repaired prior to the connection of any future development to the sewers.

Water Supply

The watermains will be tested according to the requirements of Irish Water prior to commissioning. Full and detailed surveys of the existing watermains to be upgraded, diverted or removed will be undertaken in advance of the works with works appropriately planned and sequenced to ensure that risk of any temporary loss of supply to local residents is negated.

Electricity Supply

The ESB will install all of the new incoming supplies to the proposed development. All electrical work will be carried out by authorised personnel who have the required expertise. ESB will also liaise with residents and keep customers fully informed of any brief outages which may be required. Any construction phase site lighting or security installed by the contractor will be looking inwards to the compound and will not impact on neighbouring properties. All work in the vicinity of the ESB network will be completed in compliance with the ESB document 'National Code of Practice for the Customer Interface'.

Gas Supply

Gas Networks Ireland will carry out all works on the gas supply network in a controlled manner to avoid loss of service to existing customers. All work in the vicinity of gas transmission network will be completed in compliance with the Bord Gais Networks document 'Code of Practice 2011 – Working in the Vicinity of the Transmission Network'.

Telecommunications

The relevant utility provider will install all of the new incoming supplies to the new development. All work will be carried out by authorised personnel who have expertise in the required works. This will minimise disruption to surrounding areas. All work in the vicinity of the telecommunications network will be completed in compliance with the relevant telecommunication providers 'Code of Practice' document.

12.6.2 Operational Phase Mitigation

Surface Water Drainage

Surface water runoff from the proposed development will be managed in accordance with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS), with surface water attenuation and retention included as part of the main surface water drainage system.

The surface water management proposals would reduce the overall impact of the subject site on the existing environment by adopting a SuDS approach by combining elements such as green roofs, bio-retention areas, pervious paving, attenuation storage and flow control within the proposed development.

The proposed drainage system will be commissioned and subject to a regular operational inspection and maintenance regime to ensure the system keeps operating within the design specifications.

Foul Drainage

The proposed wastewater drainage system is designed in accordance with I.S. EN12056: 2000 '*Gravity Drainage Systems inside Buildings*', I.S. EN752: 2017 "*Drain & Sewer Systems outside Buildings*" and Irish Water's '*Code of Practice for Wastewater*'. The proposed drainage system will be commissioned and subject to a regular operational inspection and maintenance regime to ensure the system keeps operating within the design specifications.

Water Supply

The proposed watermain infrastructure is designed in accordance with Irish Water's '*Code of Practice for Water Infrastructure*'. The proposed water supply system will be commissioned and subject to a regular operational inspection and maintenance regime to ensure the system keeps operating within the design specifications.

Electricity Supply

All proposed power cables within the development will be underground or internal within buildings and will be installed according to ESB Networks specifications. The proposed electricity supply system will be commissioned and subject to a regular operational inspection and maintenance regime to ensure the system keeps operating within the design specifications.

Gas Supply

There are no gas connections proposed to the development.

Telecommunications

All proposed telecommunications cabling within the development will be underground or internal within buildings.

12.7 CUMULATIVE IMPACTS

A review of permitted developments within the study area has been undertaken to assess if potential impacts from these developments acting in combination with the proposed development would alter or magnify the potential impacts. The permitted developments include:

- Planning ref 2997/21-Application to increase the number of residential units within Emmet Court from 96 to 112.
- Planning ref 3815/20-Application for development within Our Lady of Lourdes National School. This development appears generally to provide permanent accommodation in lieu of temporary. Thus, it is considered that this would not act in combination with the proposed development to alter or magnify the potential impacts from a utilities perspective.
- Planning ref 4260/19-Application for development of 52no. apartment dwellings on Site 1b St. Michael's Estate.
- Planning ref 2453/19-Amendment to previously permitted scheme to rear of 205A Emmet Road seeking to increase the height of the previously permitted scheme with an associated increase
- Planning Reg. Ref. ABP-303435-19 - Permitted SHD application located the Former Dulux Factory Site, Davitt Road, Dublin 12 for the construction of 265 Build to Let Apartments, 119 car parking spaces.
- Planning ref 2747/20-Amendment to previously permitted residential development on the Former Dulux Factory Site. It is noted that this amendment would not increase footprint of the building or the quantum of residential units. Thus, it is considered that this would not act in combination with the proposed development to alter or magnify the potential impacts from a utilities perspective.
- Planning ref 2221/21-Part 8 application for the demolition of the former health centre and St. Michael's community centre at Emmet Road. The demolition of these existing buildings would reduce slightly the current demand on utilities. However, this would be relatively minor in nature and would not materially alter the potential impacts of the proposed development.

Another application of note is the Liffey Valley to City Centre Bus Connects route which is currently under consideration. This route involves upgrades along Emmet Road (KA29N.314091) but it is not considered to alter or magnify potential impacts of utilities from the proposed development.

12.7.1 Stormwater Infrastructure

The site is located in an area with a long history of urban development. The proposed development incorporates SuDS measures and limits run-off to greenfield run-off rates in line with Local Authority requirements and best practice. The permitted developments and any further development in the area would need to comply with current best practice methods and may lead to an improvement in surface runoff conditions. It is thus considered that current or future permitted developments would not act in combination with the proposed development to alter or magnify the potential impacts from a stormwater infrastructure perspective.

12.7.2 Foul Infrastructure

The site is located in an area with a long history of urban development, with the area served by a dedicated foul sewer network. A confirmation of Feasibility has been received from Irish Water for the proposed development

confirming that connection is possible without upgrade works. While any redevelopment in the area resulting in an intensification of land use or increased density of occupation would likely lead to an increase in foul flow contributing to the receiving sewerage network, development would have to meet with the requirements of Irish Water in terms of feasibility of same.

12.7.3 Potable Water Infrastructure

A confirmation of Feasibility has been received from Irish Water for the proposed development confirming that connection is possible with upgrade works along Emmet Road. These works involve the provision of a new 200mm diameter main to replace the existing 6inch main along Emmet Road for a distance of c.180m. This upgrade works will provide additional capacity to the public watermain system which serves some of the permitted developments.

12.7.4 ESB Infrastructure

Any redevelopment in the area resulting in an intensification of land use or increased density of occupation would likely lead to an increase in demand on the electricity supply network. However, there is substantial existing electricity supply infrastructure in place and it is envisaged that the permitted developments would not act in combination with the proposed development to alter or magnify the potential impacts from an ESB infrastructure perspective.

12.7.5 Gas Infrastructure

There is no connections to the gas network proposed as part of the development and thus no impact on same.

12.7.6 Telecommunications Infrastructure

Any redevelopment in the area resulting in an intensification of land use or increased density of occupation would likely lead to an increase in demand on the telecommunications networks. However, there is substantial existing telecommunications infrastructure in place and it is envisaged that the permitted developments would not act in combination with the proposed development to alter or magnify the potential impacts from a telecommunications perspective.

12.7.7 'Do Nothing' Impact

In the 'do nothing' scenario, there would be no change to the demand on the utilities with surface drainage, foul drainage, ESB, gas and telecommunications to remain at current demand and capacity.

If the development were not to proceed, the proposed upgrade of the watermain along Emmet Road would not be undertaken and thus there would be no increase in the capacity of the local system.

12.8 PREDICTED (RESIDUAL) IMPACTS OF THE PROPOSED DEVELOPMENT

12.8.1 Construction Phase

Surface Water Drainage

With the adoption of the proposed mitigation measures, the residual impacts on surface water drainage during construction are considered to be negative, not significant and temporary.

Foul Drainage

With the adoption of the proposed mitigation measures, the residual impacts on foul drainage during construction are considered to be negative, not significant and temporary.

Water Supply

With the proposed mitigation in place, the residual impacts on water supply during the construction phase of the project are considered to be negative, moderate and temporary.

Electricity Supply

With the proposed mitigation measures in place, residual impacts on electricity supply are considered to be negative, not significant and temporary.

Gas Supply

With the proposed mitigation measures in place, residual impacts on gas supply are considered to be negative, slight and temporary.

Telecommunications

With the proposed mitigation measures in place, residual impacts on telecommunications are considered to be negative, slight and temporary.

12.8.2 Operational Phase

Surface Water Drainage

The proposed SuDS for the development incorporates flow control and attenuation of discharge from the site to the receiving drainage network, limiting run-off to the equivalent green field run-off rate.

The impacts on surface water discharge from the site are considered to be negative, not significant and permanent.

Foul Drainage

The proposed development will increase the quantity of wastewater discharged to receiving wastewater sewerage network. The impacts on wastewater drainage from the site are considered to be negative, not significant and permanent.

Water Supply

It is considered that the residual effects on the watermain network will be positive, moderate and permanent.

Electricity Supply

The proposed development will increase the demand on the electricity supply system. The proposed development incorporates 6no. ESB substations which are provided, in consultation with ESB Networks, to accommodate the development. Thus, it is considered that the residual impact on electricity supply is negative, slight and permanent.

Gas Supply

The proposed development will not increase the demand on the gas supply network and thus the impact is considered to be neutral, slight and permanent.

Telecommunications

The proposed development will increase the demand on the telecommunications systems. However, it is expected that infrastructural requirements for future development will be accommodated by utility service providers. Thus, it is considered that the residual impact on telecommunications is negative, slight and permanent.

12.9 MONITORING

Surface Water Drainage

Upon installation of new surface water drains, pressure tests will be carried out to assess the potential for leaks to occur in the newly constructed drains.

Foul Drainage

Upon installation of new foul drains, pressure tests will be carried out to assess the potential for leaks to occur in the newly constructed drains.

Water Supply

Upon installation of new watermains, pressure tests will be carried out to assess the potential for leaks to occur in the newly constructed watermains. The proposed watermain system will incorporate water meters at all points of connection to the public watermain network; this will facilitate ongoing monitoring of demand and assessment for potential leakage.

Electricity Supply

ESB will test and commission their installation and will monitor and maintain their ESB sub-stations and network cabling post installation. All supplies will be individually metered to allow the new loads on the network to be monitored in use.

Gas Supply

All natural gas pipework will be installed and pressure tested in accordance with I.S. 820 and Gas Networks Ireland guidelines and a non-domestic certificate of conformance will be required from the contractor prior to gas being switched on. Gas detection systems will be provided where appropriate and will be linked to the Building Management System to shut off the gas supply in the event of a leak.

Telecommunications

The providers of incoming telecommunications supplies will test and commission all their cabling/ work and will monitor and maintain their network cabling post installation.

12.10 REINSTATEMENT

The proposed watermain upgrade works will require reinstatement of the public road as part of the construction works.

12.11 INTERACTIONS

Please refer to Chapter 16 for interactions.

12.12 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no difficulties encountered in compiling this section.

13.0 CULTURAL HERITAGE – ARCHAEOLOGY

13.1 INTRODUCTION

IAC Archaeology have prepared this chapter on behalf of Dublin City Council to assess the impact, if any, on the archaeological and cultural heritage resource of a proposed development at Emmet Road, Inchicore, Dublin 8 (ITM 712068, 733321, Figure 13.1). This chapter was prepared by Faith Bailey (MA, BA (Hons), MIAI, MCIfA). Faith has over 18 years' experience in archaeological and cultural heritage consultancy, responsible for the production of EIAR and assessments for all aspects of development nationwide. Architectural, or built heritage, is specifically addressed in Chapter 14 of this EIAR by Blackwood Associates.

This study determines, as far as reasonably possible from existing records, the nature of the archaeological and cultural heritage resource in and within the study area of the proposed development using appropriate methods of study. Desk-based assessment consists of an analysis of existing written, graphic, photographic, and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage assets (CIfA 2014). This leads to the following:

- determining the presence of known archaeological and architectural heritage assets that may be affected by the proposed development;
- assessment of the likelihood of finding previously unrecorded archaeological remains during the construction programme;
- determining the impact upon the setting of known cultural heritage sites in the surrounding area; and
- suggested mitigation measures based upon the results of the above research.

The study involved detailed interrogation of the archaeological and historical background of the proposed development area. This included information from the Record of Monuments and Places of County Dublin, the Dublin City Development Plan 2016–2022, the Draft Dublin City Development Plan 2022-2028, the topographical files of the National Museum of Ireland, and cartographic and documentary records. Inspection of the aerial photographic and satellite imagery coverage of the proposed development area held by the Ordnance Survey, Bing Maps, and Google Earth has also been carried out. Field inspections have been carried out in an attempt to identify any known archaeological and cultural heritage sites and previously unrecorded features or portable finds within the proposed development area.

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

13.2 LEGISLATION AND GUIDELINES

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

- National Monuments Act, 1930 to 2014;
- The Planning and Development Acts, 2000 (as Amended);
- Heritage Act, 1995, as amended;
- Draft Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), 2017, EPA;
- Guidelines on the Information to be Contained in Environmental Impact Statements. Dublin. Government Publications Office, 2022, EPA;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht, and Islands; and
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000.
- Architectural Heritage Protection: Guidelines for Planning Authorities, 2011, (formerly) Department of Arts, Heritage and the Gaeltacht

13.3 CONSULTATION

During scoping and research for the assessment and EIAR, a number of statutory and voluntary bodies were consulted to gain further insight into the cultural background of the receiving environment and study area, as follows:

- Department of Housing, Local Government and Heritage (DoHLGH)– the Heritage Service and Policy Unit, National Monuments and Historic Properties Section: Record of Monuments and Places; Sites and Monuments Record; Monuments in State Care Database; Preservation Orders; Register of Historic Monuments;
- National Museum of Ireland, Irish Antiquities Division: topographical files of Ireland; and
- Dublin City Council: Planning Section.
- Dublin City Council: Conservation Section.

13.4 DEFINITIONS

In order to assess, distil and present the findings of this study, the following definitions apply:

‘Cultural Heritage’ where used generically, is an over-arching term applied to describe any combination of archaeological, architectural, and cultural heritage features, where –

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

13.5 METHODOLOGY

13.5.1 Archaeological, Architectural and Cultural Heritage

Research for this report was undertaken in two phases. The first phase comprised a paper survey of all available archaeological, historical, and cartographic sources. The second phase involved a field inspection of the site.

13.5.1.1 Paper Survey

This is a document search. The following sources were examined and a list of areas of archaeological and cultural heritage potential was compiled:

- Record of Monuments and Places for County Dublin;
- Sites and Monuments Record for County Dublin;
- National Monuments in State Care Database;
- Preservation Orders List;
- Register of Historic Monuments;
- Topographical files of the National Museum of Ireland;
- Cartographic and written sources relating to the study area;
- Dublin City Development Plan 2016–2022;
- Draft Dublin City Development Plan 2022-2028
- Aerial photographs;
- Excavations Bulletin (1970–2022);
- Place Names;
- The Dublin City Industrial Heritage Record (DCIHR); and
- British Military Archives

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

Sites and Monuments Record (SMR) holds documentary evidence and field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g. only a site type and townland are recorded. These are known to the National Monuments

Section as ‘un-located sites’ and cannot be afforded legal protection due to lack of locational information. As a result, these are omitted from the Record of Monuments and Places. SMR sites are also listed on a website maintained by the Department of Housing, Local Government and Heritage (DoHLGH) – www.archaeology.ie.

National Monuments in State Care Database is a list of all the National Monuments in State guardianship or ownership. Each is assigned a National Monument number whether in guardianship or ownership and has a brief description of the remains of each Monument.

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

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

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

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

Cartographic sources are important in tracing land use development within the development area as well as providing important topographical information on areas of archaeological potential and the development of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape. The analysis also aids with the construction history of the site from the time on which the site was first development up to the present day.

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

Development Plans contain a catalogue of all the Protected Structures and archaeological sites within the county. The Dublin City Development Plan (2016–2022) and draft plan (2022-2028) were consulted to obtain information on architectural and cultural heritage sites in and within the immediate vicinity of the proposed development area.

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

Excavations Bulletin is a summary publication that has been produced every year since 1970. This summarises every archaeological excavation that has taken place in Ireland during that year up until 2010 and since 1987 has been edited by Isabel Bennett. This information is vital when examining the archaeological content of any area, which may not have been recorded under the SMR and RMP files. This information is also available online (www.excavations.ie) from 1970–2022.

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

past. The main references used for the place name analysis is *Irish Local Names Explained* by P.W Joyce (1870) and the Place Names Database of Ireland. (www.logainm.ie).

The Dublin City Industrial Heritage Record (DCIHR) makes recommendations for sites to be added to the list Record of Protected Structures (RPS) in the life of the City Development Plan and is maintained by Dublin City Council DCC. It is a policy of Dublin City Council to implement the relevant recommendations of the Dublin City Industrial Heritage Record (Policy FC68).

British Military Archives

Research obtained for the Richmond Barracks Restoration project 2016 was also used to inform the development of the site from when ownership was transferred from the previously land owner (William Smith) to the British Military in the early 19th century.

13.5.1.2 Field Inspection

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

The archaeological field inspection, which was carried out during October 2020, entailed:

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

13.6 IMPACT/EFFECT DEFINITIONS

The likely significant effects in this Chapter, described using the terminology in Table 3.4 in the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, EPA, May 2022 (the EPA Guidelines 2022) as follows:

Table 13.1 – Significance of Effects

Significance of Effects on the Receiving Environment	Description of Potential Effects
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 most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

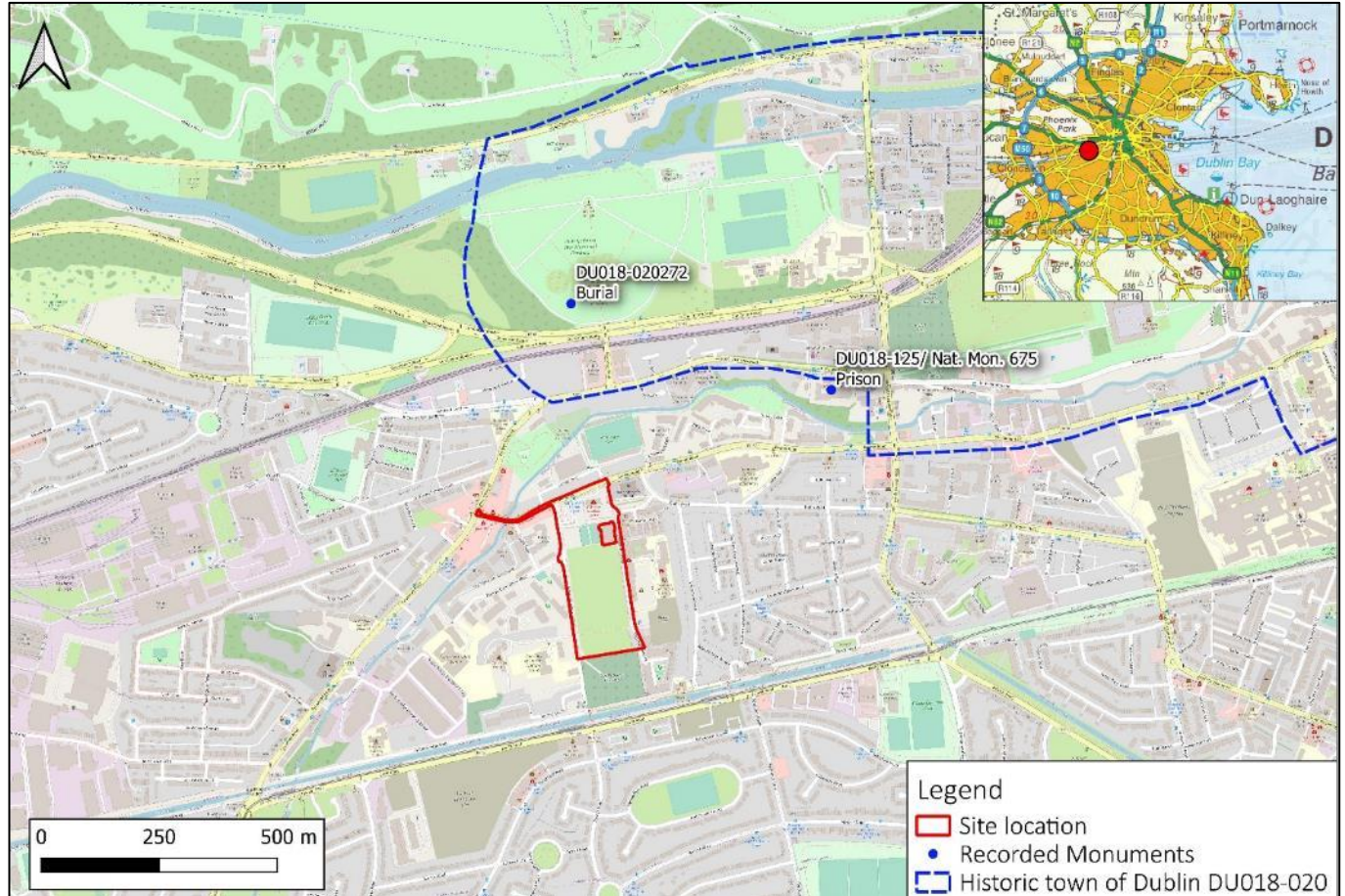
Source: Table 3.4 of the EPA Guidelines 2022

13.7 RECEIVING ENVIRONMENT: ARCHAEOLOGICAL AND CULTURAL HERITAGE

13.7.1 Archaeological and Architectural Historical Background

The proposed development area is located at Emmet Road, Inchicore, Dublin 8 (Figure 13.1). There are no recorded monuments within the proposed development area. The nearest recorded monument is the zone of archaeological potential associated with Dublin City, which is situated c. 200m to the north-northwest (DU018-020). The closest recorded individual site consists of a burial (DU018-020272), which is located c. 395m north.

Figure 13.1 – Site location showing nearby archaeological heritage



13.7.1.1 Prehistoric Period

While recent discoveries may indicate a late Palaeolithic human presence in the southwest of Ireland (Dowd and Carden 2016), it is generally accepted that widespread human colonisation of the island of Ireland began in the Mesolithic period (8000-4000 BC). During this period small groups of people migrated through the landscape, hunting, fishing, and foraging as a way of life. Due to the transient nature of this lifestyle, little archaeological evidence survives in terms of settlement. Often the only indication of the presence of Mesolithic people in an area are scatters of flint tools and debitage resulting from the manufacture of such tools. Occasionally, shell middens have been dated to the Mesolithic period.

The River Liffey and River Camac would have made the proposed development area an attractive location for occupation given the resources available in riverine environments (Clarke 2002). Mesolithic deposits have been identified within the former estuarine area associated with the River Liffey and Mesolithic fish traps were excavated at Spencer Dock c. 4.6km to the east-northeast (McQuade and O’Donnell 2007) and along the shores of Dublin Bay, north and south (Mitchell 1972).

During the Neolithic period communities became less mobile and their economy became based on the rearing of stock and cereal cultivation. This transition was accompanied with major social change. Agriculture demanded an altering of the physical landscape; forests were rapidly cleared, and field boundaries constructed. There are no previously recorded archaeological sites dating to this period within the vicinity of the proposed development;

however, the two rivers would have still remained as a major resource to be exploited during this period, proven by the Neolithic fish trap discovered at Spencer Dock (McQuade and O'Donnell 2007).

Evidence for Bronze Age activity is similarly focused upon the River Liffey and evidence for early Bronze Age activity was uncovered at Kilmainham c. 1.3km northeast of the proposed development area in the form of a small cremation cemetery located on a gravel ridge overlooking the Liffey. The cemetery comprised of six burial pits, each of which contained cremated human bone (Licence 02E0067, Bennett 2006:665).

The first evidence for Dublin acting as a significant fording point or routeway dates to the late Bronze Age. An extensive wooden riverside revetment, c. 130m long, was excavated at Islandbridge, c 1km northeast of the proposed development area. Dates from the timbers ranged from the late Bronze Age into the Iron Age and the structure may have been associated with a fording place at Kilmainham (Licence 07E0261, Bennett 2007:519).

13.7.1.2 Early Medieval Period (AD 500–1100)

Settlement across County Dublin advanced during the early medieval period when the area now known as County Dublin straddled the ancient kingdoms of *Brega* (north of the River Tolka) and *Laigin* (south of the Tolka).

The name Dublin (*Dubhlinn*), meaning 'black pool', is generally taken to refer to the pool or pond that was located directly southeast of the site of the present Dublin Castle. However, this name has been suggested as referring to an early Christian monastic settlement south of the black pool and Clarke (1990) believes that this interpretation of *Dubhlinn* would explain why the town has two names – *Dubhlinn* (for the enclosed ecclesiastical area) and *Baile Ath Cliath* – a secular settlement that was developed to guard over the 'ford of the hurdles'.

Ireland in the early medieval period was traversed by five great route ways. Two of these roads converged on Dublin, namely the *Slighe Midluachra*, which crossed the Liffey at the location of the 'ford of the hurdles' and the *Slighe Mhór*, which travelled westwards along the ridge of ground immediately south of the Liffey watercourse. The *Slighe Mhór* is believed to have continued westwards, following esker ridges across the raised bogs of the midlands, fording the Shannon at Clonmacnoise to arrive eventually at Galway Bay. This routeway would have divided the island into two symbolic halves, called *Leth Conn* (north) and *Leth Moga* (south) (Clark 2002). As such, it can be considered to be among the most important ancient routeways in the country. The route of the *Slighe Mhór* is believed to be preserved in the layout of modern-day Old Kilmainham, St. James's Street and Thomas Street to the east of Emmet Road.

The earliest known history and habitation of the lands around the study area relate to the 7th century monastic site at the Royal Hospital Kilmainham, located c. 667m northeast of the proposed development area, now Bully's Acre. This consisted of a monastic house known as *Cill Maighnennan* (DU018-020283), which was located on the high ground between the River Camac and the River Liffey near their confluence (De Courcy 1996, 340). While no visible trace of the monastery survives, it was from these early monastic beginnings that the later village of Old Kilmainham evolved. The Camac River powered the mills at the monasteries at Kilmainham and Clondalkin (O'Broin 1999). A small church, known as *Cell-Mo Shamhog*, was located across the river in the Phoenix Park and its name survives (in an anglicised form) in the name of the crossing of the Liffey near Island bridge: Ford of *Kilmohavoc*.

The only surviving early medieval monument in the Inchicore/Kilmainham district is a decorated granite shaft (DU018-020284) in the burial ground known as Bully's Acre, which represents the area of the original monastic cemetery. There is evidence for an unknown number of unaccompanied burials (i.e., without grave goods), apparently native Irish, in the area of the Viking cemetery at Kilmainham; the origins of this cemetery probably lie in its association with the early Christian monastery at *Cill Maighnenn* (O'Brien 1998, 217).

During the latter part of this period the Dublin area was transformed by the arrival of the Vikings who had established themselves on the shores of the Liffey by the middle of the 9th century. By the 10th century, Dublin had become a recognised urban centre. The first Viking settlement within Dublin consisted of a longphort, which was a semi-permanent encampment used initially as an over-winter base, but then developed over the succeeding 60 years into an important market place and commercial centre. The precise location of this settlement has remained somewhat elusive and both the current site of Dublin Castle and an area of Kilmainham close to the current Heuston Station have been proposed. Clarke has argued that the initial longphort of the Vikings was actually the enclosure of *Dubhlinn* commandeered by the invaders. He also proposes that the second secular enclosure at *Ath Cliath* was also commandeered soon after (2002). Excavations at the intersection of Stephen's Street Lower and South Great George's Street in 2003, c. 3.4km east of the proposed development area, produced evidence of a Viking cemetery and associated settlement, along the southern flank of the 'Black Pool' (*Dubhlinn*), which was found to extend as far south as the excavated area. This activity can likely be dated to the 9th century and would seem to add weight to Clarke's thesis.

Extensive Viking graves have been discovered in the area on the southern side of the Liffey between Heuston Station and the western boundary of the Memorial Park at Inchicore. In 1800, Viking coins and a sword were found at Bully's Acre when the granite shaft mentioned above was being re-erected following its collapse. In 1836, the first Viking burial was identified during gravel quarrying to the rear of Island Bridge Barracks. In the 1840s, during the construction of the Great Southern Railway, a large number of discoveries, mainly swords and iron tools, came to light adjacent to Heuston Station and in cuttings between there and Inchicore. Again in 1866, Sir William Wilde noted an abundance of material found along the line of the Inchicore Road and the line of the South Circular Road towards Islandbridge (Wilde 1866). In addition to skeletons, 78 items (including seven swords, six spearheads, four shield-bosses, an Insular zoomorphic mount, a belt buckle, several knife blades, two weighing scales, two oval brooches, a miniature axe and other household items) were found in a sandpit from which road building material was being removed.

These findings were originally thought to represent the largest Viking burial place outside Scandinavia, but more accurately represent two large separate cemeteries (O'Brien 1998). The extensive and scattered burials date from AD 850, although evidence also suggests that the Viking burials may have been inserted into existing cemeteries belonging to the indigenous population, whose burial rite was that of extended supine inhumation in unprotected graves or in slab-line graves with no grave goods (O'Brien 1998).

In 1933–4, when the amphitheatre for the War Memorial Park was being excavated, five separate grave sites were discovered at the west end of the park in the area of the sunken garden c. 395m north of the proposed development area. The associated finds included a double-edged sword with bronze plaiting on its pommel, a double-edged sword (ritually broken in three parts), a spearhead, axe and two iron daggers (DU018-020272).

From 917 AD onwards, the Vikings were established at the confluence of the Liffey and the Poddle in an area that stretches today from Christchurch Cathedral to Dublin Castle. This settlement appears to have been founded as a trading town, with archaeological evidence suggesting the presence of individual property plots, a street layout and earthen defences. During the 11th century the town was expanded and developed until it comprised of c. 12 hectares on the southern side of the river. A number of Viking sites were excavated during construction in the area and include Viking settlement at Wood Quay c. 3.1km east-northeast of the proposed development area (DU018-020133).

The plateau between the Liffey and Camac was also reputedly used by Brian Boru as his headquarters when he laid siege to Dublin in 1013. He returned in 1014, prior to the Battle of Clontarf and is said to have burned down whatever may have stood at Cill Maighnennan (De Courcy 1996). Traditional folklore suggests that his son, Murchadh, and grandson, Turlough, both of whom were also killed at Clontarf, were laid to rest under the granite shaft in Bully's Acre.

13.7.1.3 Medieval Period (AD 1100–1600)

The beginning of the medieval period is characterised by political unrest that originated from the death of Brian Borumha in 1014. Diarmait MacMurchadha, deposed King of Leinster, sought the support of mercenaries from England, Wales, and Flanders to assist him in his challenge for kingship. Norman involvement in Ireland began in 1169, when Richard de Clare and his followers landed in Wexford to support MacMurchadha. Two years later de Clare (Strongbow) inherited the Kingdom of Leinster through marriage to Aoife MacMurchadha, Diarmait's daughter. By the end of the 12th century the Normans had succeeded in occupying much of the country (Stout and Stout 1997). The initial stage of the invasion of the country is marked by the construction of motte and bailey castles that were often later replaced with stone-built castles.

This time period is synonymous the creation of new towns and enlargement of older urban centres. The Norman tenurial system more or less appropriated the older established land units known as *túaths* in the early medieval period but renamed the territories as manors (MacCotter 2008). At this time, the Anglo-Normans were focused on re-enforcing the defences of Dublin City, with the medieval city located c. 2km to the east of the site.

In 1174, the fortified Priory of St. John the Baptist was constructed near the site of Saint Maighnean's old monastery and it was here that Richard de Clare, colloquially known as Strongbow, established the Knights Hospitallers of Saint John of Jerusalem (DU018-020286), c. 280m north-northeast of the proposed development area. He bestowed on them a large tract of land stretching for c. 5km from Heuston Station to Palmerstown.

During the medieval period the area of proposed development was located outside the city walls and only gradually became part of the western suburbs of Dublin in later centuries. The Bow Bridge crosses the River Camac at

Kilmainham c. 430m northeast of the proposed development area (DU018-020287). It appears to have been erected sometime after AD 1200 and is shown on the Down Survey of 1655 as 'Bowe Bridge' on the 'Cammock River'.

13.7.1.4 Post-Medieval Period (AD 1600–Present day)

By 1618 the Government decided that it required an official residence away from Dublin Castle for the King's Viceroy in Ireland and they bought the Phoenix House from Sir Edmund Fisher. They bought all the surrounding lands on the north side of the Liffey to form a demesne in conjunction with the old Priory lands on the south side at Kilmainham and part of Inchicore; all of which made up the original Phoenix Park.

During the 1760s the Grand and Royal Canals were excavated, essentially creating a boundary line around the expanding city. The proposed development area is situated c. 112m north of the Grand Canal route. The wider area received greater transport options in the 19th century with the construction of the Great Southern and Western Railway, c. 435m to the northwest of the development area, which was built and running by 1846. It became the Great Southern Railway in 1924, when it amalgamated with the Midland and Great Western Railway.

Kilmainham Gaol (DU018-125, Nat. Mon. 675) opened in 1796, c. 430m to the west-northwest of the proposed development area and interred many of the leading figures of Irish nationalism. These included Henry Joy McCracken of the 1798 rebellion, Robert Emmet of the 1803 rebellion, William Smith O'Brien and Thomas Francis Meagher of the 1848 'Young Irelander' rebellion, several Fenians from the 1867 uprising, Charles Stewart Parnell leader of the Irish Parliamentary Party in 1881, the Invincibles in 1882, Patrick Pearse, Joseph Plunkett, and James Connolly of the 1916 Rising, and Eamon de Valera leader of the Republicans during the Civil War (1922-24). The gaol closed after releasing its last prisoner, de Valera, in 1924.

The proposed development area is located within a former barracks, which was established during the 19th century. Work on Richmond Barracks began in 1810, during the Napoleonic wars, when the 4th Duke of Richmond was Lord Lieutenant. The site area covered 23 acres and the stone for the buildings was quarried on site. Warm springs were discovered in the quarrying operations and there were a number of fashionable spas here, from which the nearby Spa Road derives its name. The quarry and spa are shown on the Taylor map of 1816. Originally built to defend the capital, the threat of invasion disappeared after Waterloo and the barracks became a recruiting centre. Almost every British regiment spent a year here between the first occupation in 1814 and its handover to the Free State in 1922. It was used mainly for infantry, housed 76 officers, 1600 men, a small hospital and some stables. A garrison church (now St. Michael's Church), still standing and in use, was built by 1857. Battalions were dispatched from here to the Crimean and Boer wars.

The barracks were built in H-configurations with a north and a south gate. The three remaining buildings immediately east of the development area were constructed in the 1860's and 70's. The first of the two outer stone-built buildings was opened in 1864, followed shortly by the second. The brick-built gymnasium between the two stone buildings was built during the 1870s.

In 1913, soldiers from here were dispatched to deal with rioting during the general strike. Among the volunteers enlisting for the Great War in 1914 were Lord Dunsany, and his friend, the poet Francis Ledwidge. Both were based at Richmond Barracks before departure for the front, during which time Ledwidge wrote many new poems and entertained his comrades in the recreation room. In 1916, the Royal Irish Regiment was sent from Richmond Barracks to defend the South Dublin Union. After the surrender, more than 3000 prisoners were detained in Richmond Barracks. The leaders were held in the gymnasium building, including the signatories of the Easter Proclamation and others: Eamon de Valera, Countess Markievicz, Michael Collins, Arthur Griffith, William T. Cosgrave, Eoin MacNeill, Tomas Ashe, Noel Lemass and Sean T. O'Kelly. Prime Minister Herbert Asquith visited Richmond Barracks in 1916, after which conditions improved.

In 1922, the Free State Army took over from the departing British Army. Shortly afterwards, Richmond Barracks was handed over to Dublin Corporation for use as housing. The housing was largely located on the western side of the barracks site where the area was named Keogh Square. The three, existing single-storey units were retained as a school, which was taken over by the Christian Brothers in 1929 and continued to function until 2006. The majority of the barracks buildings including Keogh Square were largely demolished by the 1970s to be replaced by the St Michael's Estate flats complex. The flat complex was demolished between 2000 and 2013.

Post medieval structural remains of the barracks have been identified to the immediate east and southeast of the proposed development area (Licence 08E0736 Bennett 2008:466, Licence 10E0407 Bennett 2010:278).

The remaining buildings are considered to be historically important because they are almost all that survives of one of Dublin's largest early 19th century military barracks complexes and because of their significance in the context of the 1916 Rising. The brick central building, formerly the barracks gymnasium, was used to detain some of those arrested during the Rising. The leaders were court-martialled in Richmond Barracks and taken from here to Kilmainham Gaol to be executed. The gymnasium and the stone building to the south are currently in use as a visitor centre exhibiting information on the history of Richmond Barracks, Keogh Square and St. Michael's Estate.

13.7.2 Summary of Previous Archaeological Fieldwork

Archaeological monitoring of Site Investigations within the proposed development area was undertaken by IAC Archaeology in September 2020. Beneath demolition material relating to the former social housing that occupied the site the fragmentary remains of elements associated with the 19th century Richmond Barracks were recorded in a number of locations (Figure 13.2). The mortar and red brick foundations of the barracks were recorded, where present, at a depth of between 0.8-0.9m below existing ground level in the southern portion of the proposed development area (Plate 13.1). In the northern section of the proposed development area, a brick-and-mortar feature possibly relating to the barracks was identified in TP4, at a depth of c. 0.2m (Plate 13.2).

A review of the Excavation Bulletin (1970-2022) and the available excavation reports has revealed that archaeological investigations have been carried out at two sites to the immediate east and southeast of the proposed development area. Archaeological testing was carried out immediately east under licence 08E0736 and identified the structural remains of the 19th century barracks, which formerly stood on the site. The foundations of the barracks were identified at a depth of 0.5-0.7m below the existing ground surface (Bennett 2008:466). Remains of the former Richmond Barracks were also identified at a site immediately southeast of the proposed development area under licence 10E0407 (Bennett 2010:278). In this case the foundations were identified at a depth of 0.65m below existing ground level. A number of barracks structures were recorded including boundary walls, yards, military stables, general stores, offices and a three chambered underground sand-filter water filtration system. No features predating the 19th century were recorded.

Archaeological testing, c. 57m west of the proposed development, failed to identify any features of archaeological potential (Licence 01E0745, Bennett 2001:431). Archaeological monitoring was carried out along Davitt Road as part of the Luas project c. 134m south of the proposed development area (Licence 01E0733, Bennett 2001:359, 2002:0688). In this section of the scheme, the route followed an alignment immediately south of the Grand Canal and was contained within the area disturbed by the construction of the canal. No features of archaeological significance were encountered.

A programme of archaeological testing was carried out at Inchicore National School, c. 188m northwest of the proposed development area (Licence 08E0098, Bennett 2008:444). Nothing of archaeological significance was identified during these works. Archaeological testing at Goldenbridge House, c. 423m west of the proposed development area, also failed to identify any deposits or features of archaeological significance (Licence 00E0466, Bennett 2000:0302).

At the Irish War Memorial Park and Con Colbert Road c. 330m to the north of the proposed development area, a number of significant archaeological investigations have taken place to date. Historical accounts dating to the 1840s record that a number of burials were encountered during the construction of the railway line. These inhumations were associated with a significant number of grave goods- including swords, daggers and other weaponry. As a result of this and that fact the vast majority were believed to have been male individuals, they were interpreted as 'Viking Warrior' burials. The grave goods were of an 9th century style. Further burials, also accompanied by grave goods, were identified during the construction of the Irish War Memorial Park in 1933 and the site of their discovery is now a recorded monument (DU018-020272). A monitoring programme at Con Colbert Road, under licence E0497, identified a number of archaeological features, including pits which contained what could be described as domestic waste, such as animal bone, oyster and mussel shell. There was also evidence of hearths or kilns, and industrial features such as furnaces. Taken together, these features suggest that this area was not only in use as a burial ground but it may have been the location of a settlement. Although this settlement may have been temporary in nature.

The excavation of a trench for an electrical cable revealed a sword and spearhead of Scandinavian style in within the War Memorial Gardens. The construction workers involved also reported that bone had been visible in the trench but was not removed. Following report to the National Museum of Ireland, the immediate area was archaeologically investigated under licence 08E0693. A heavily disturbed inhumation was identified, orientated north-south. A copper-alloy loop-headed ringed pin was also recovered (Bennett 2008:467).

Archaeological testing for the Dart Underground project identified a number of potential early medieval pits, though these could not be dated. No further human remains were identified at this time (Licence 10E0128, Bennett 2010:279).

Figure 13.2 – Location of site investigations (those revealing 19th century remains are marked in red)

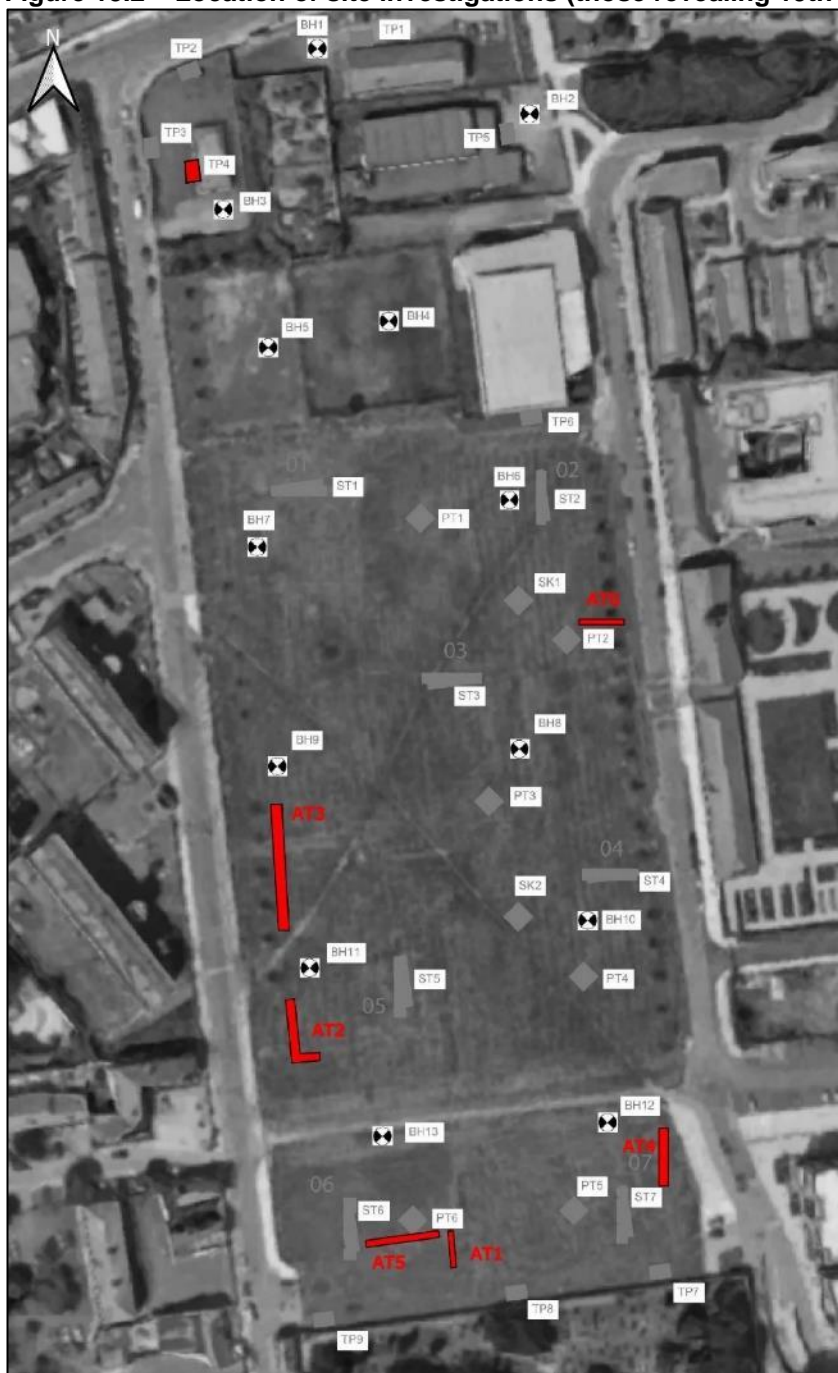




Plate 13.1: Structural remains of the 19th century barracks (AT1)



Plate 13.2: Brick and mortar feature in TP4

13.7.3 Cartographic Analysis

William Petty, Down Survey Map of the Parish of Kilmmainham, c. 1655

While no details relating to the specific site of the proposed development area are visible, the parish map provides more detail of the surrounding area than is often found on the survey maps. The River Camac is clearly marked and labelled. Several structures to the west of the proposed development are marked as 'Killmainham Towne' (DU018-020300). Two mills are marked on the river to the east (DU018-020288/9). The proposed development area is located within 'Inchycore' and a road is shown 'to Lucan from Dublin'. No structures or other features are shown within the approximate location of the proposed development area.

John Rocque, A Survey of the City, Harbour, Bay, and Environs of Dublin, 1757

At the time of this map the River Camac flows in two channels, the northern of which appears to serve two mills, one at Goldenbridge and another on the Inchycore Road (Figure 13.3). The two channels re-join at Kilmmainham to the east. The proposed development area appears to be located within a number of agricultural fields to the south of the

Kilmainham Road. No features or structures are shown within the approximate location of the proposed development area. The lands where the Barracks was to be built upon were owned by Mr. William Smith up until their purchase by the British Military 1809. The lands where Golden-Bridge Cemetery now lie were retained by Smith to be acquired by the Sisters of Mercy. By January 1810 Tenders for the construction of the Barracks appeared in newspapers and notice was also given in Parliamentary Papers dated 1810.

Figure 13.3 – Extract from Rocque’s map of 1757 (showing the approximate location of the proposed development area)



John Taylor, Map of the Environs of Dublin, 1816

Richmond Barracks is depicted within the proposed development area for the first time (Figure 13.4). In the immediate area, a quarry is shown to the southwest and a number of kilns are shown to the east, along with an 'old mill'. The Grand Canal has been constructed to the south of the site by the time of this map, as has Kilmainham Gaol (DU018-125) which is labelled as 'County Goal'. The barracks were built in H-configurations with a north and a south gate. The majority of the soldier's quarters of the Barracks appears to have been completed by this stage. Additional soldiers and officers' quarters were to be constructed in the second half of the 19th century.

First edition Ordnance Survey map of 1843, scale 1:10,056

This is the first accurate map of the proposed development area (Figure 13.5). It shows the barracks occupying a large area including the proposed development area. The structures of the barracks largely border the site with a large open area depicted in the centre of the site. The cemetery is shown to the south for the first time, with a R.C. Chapel marked within it. In the wider area, a number of Mills are depicted powered by the River Camac.

Second Edition Ordnance Survey Map, 1871-5, scale 1:10,056

The time of this map, there have been a number of additional structures constructed in the north of the proposed development area and a significant large structure in the southwest corner of the proposed development area (Figure 13.6). St. Michael's Church, which was formerly the garrison church for Richmond Barracks is shown to the immediate east having been built in 1845.

Ordnance Survey map of 1889, scale 1:1056

This map shows the Richmond Barracks as largely unchanged with the majority of the structures depicted in the western and northern extents of the proposed development area (Figure 13.7). At the north of the proposed development area, a ball alley and an area annotated as 'drying ground' are shown. The road to the immediate north of the proposed development area is labelled 'Emmet Road' for the first time and a tramway has been established along its route.

Ordnance Survey Map, 1906–9, scale 1:2500

There is no significant change to the proposed development area by the time of this map in 1906-9.

New Plan of Dublin and Suburbs, 1914, scale 1:10560

At the time of the publication of this map, the Barracks Structures are illustrated. The map also shows the Camac River to the north, the cemetery including the R.C. Chapel within the cemetery walls. Emmet Road and St. Michael's Church are also indicated.

Figure 13.4 – Extract from Taylor's map of 1816 (showing the approximate location of the proposed development area)

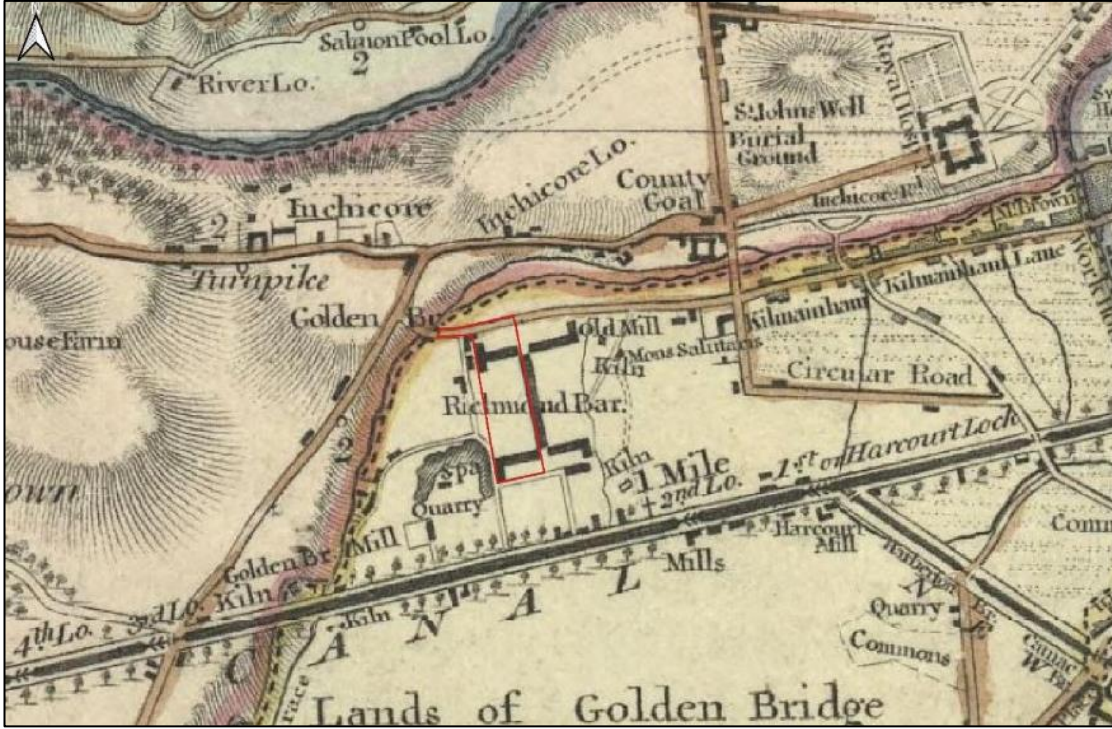


Figure 13.5 – Extract from the First Edition OS map of 1843 showing the proposed development area

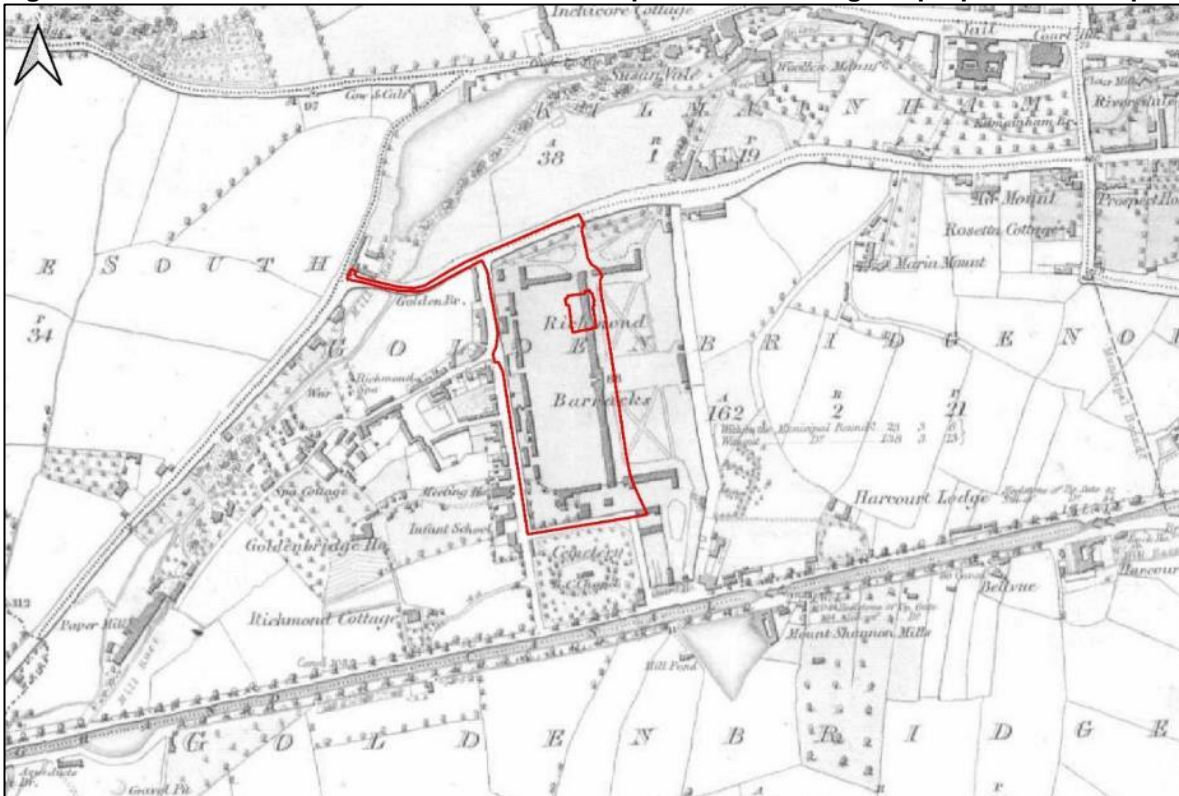


Figure 13.8 – Extract from OS map of 1947 showing the proposed development area



Ordnance Survey Map, 1931, scale 1:10560

At the time of the publication of the map, which is an updated version of the 1906-09 map, a ‘School’ is noted along the line of the three present-day Barracks buildings. These structures were historically used as Soldier’s Quarters and Gymnasium. The map also shows that the Keogh Square social housing had been constructed. This map indicates the first sign of the change of use from the military Barracks buildings. The Barracks became known as Keogh Barracks and the School was established here by the Christian Brothers in 1929 and would operate as a CBS until 2006.

Third Edition Ordnance Survey Map, 1947, scale 1:10,056

The map shows a dispensary in the north of the proposed development area (Figure 13.8), whilst the former barracks buildings and a newly constructed central development are named ‘Keogh Square’: a social housing development. The Barracks buildings to the immediate east of the proposed development area are in use as a school at this time.

13.7.4 Dublin City Development Plan

13.7.4.1 Archaeological Heritage

The Dublin City Development Plan (2016-2022) and draft plan (2022-2028) recognise the statutory protection afforded to all Record of Monuments and Places (RMP) sites under the National Monuments Legislation (1930–2014). The plans list a number of aims and objectives in relation to archaeological heritage (Appendix E Volume III of the EIAR). It is a policy of the Development Plan to promote the in-situ preservation of archaeology as the preferred option where development would have an impact on buried artefacts. Where other alternatives are acceptable or exceptional circumstances are determined by the relevant statutory agencies. Where preservation in-situ is not feasible, sites of archaeological interest shall be subject to archaeological investigations and recording according to best practice, in advance of redevelopment.

There are no recorded monuments within the proposed development area. The nearest recorded monument is the zone of archaeological potential associated with Dublin City, which is situated c. 200m to the north-northwest (DU018-020). A Scandinavian type burial site (DU018-020272), which is located c. 395m north, is the nearest individual

recorded monument. Kilmainham Gaol (DU018-125, Nat. Mon. 675) is recorded c. 430m to the west-northwest of the proposed development area and is a National Monument in State Ownership.

13.7.5 Topographical Files of the National Museum of Ireland

Information on artefact finds from the study area in County Dublin has been recorded by the National Museum of Ireland since the late 18th century. Location information relating to these finds is important in establishing prehistoric and historic activity in the study area.

A large number of archaeological artefacts are recorded in the wider area of Inchicore, Kilmainham and Islandbridge, primarily relating to the Viking burials that were uncovered throughout the 19th and 20th centuries, north of the proposed development area. The majority of these artefacts represent iron weapons, such as swords, spearheads, shield bosses, arrowheads, knives and daggers. Occasionally more personal items such as pins, rings, belt-buckles and strap ends have also been recorded.

13.7.6 Cultural Heritage

The term '*cultural heritage*' can be used as an over-arching term that can be applied to both archaeology and architectural; however, it also refers to more ephemeral aspects of the environment, which are often recorded in folk law or tradition or possibly date to a more recent period.

One of the most significant cultural heritage sites within the study area of the proposed development area is the Irish War Memorial Garden. The gardens were designed by Sir Edwin Lutyens in 1930 and were completed c. 1940. The site commemorates the Irish who served and died in the British Army during the First World War. The list of Irish soldiers who died during World War One stands at 49,435 as recorded in the Books of Remembrance, although the actual figure is believed to be much higher. The Books of Remembrance are housed in dedicated Bookrooms within the gardens. The Gardens have acted as a back drop to many commemorations and continue to be utilised as such today. The Irish War Memorial Gardens are considered to be of international significance and are visited by international dignitaries and tourists.

St. Michael's Estate has in the past 100 years been the location of various social housing developments from the time the Barracks Buildings were handed over to the state in 1922 up to the present day. After the handover, the Barracks were renamed Kehoe Barracks in honour of Tom Kehoe of the National Army who was a casualty of the Irish Civil War. In 1924 the unused buildings were converted into housing units and additional cottages were constructed along St. Vincent's Street. In 1926 the housing community was called Keogh Square. By 1928, 218 families were housed in the former barracks buildings and 248 families were housed in new houses built in the former soldier's parade ground located on the current site of the proposed development. In the 1970's Dublin Corporation constructed ten new concrete tower blocks to replace the former Keogh Square housing and to provide new housing for the residents. The area began to decline with a rise in antisocial behaviour. The new towers were demolished over phases dating from 2000 to 2013.

Families were raised in the Keogh Square and surrounding areas creating communities and establishing roots in the wider Inchicore area. The children of the families were schooled in the local CBS and Sisters of Mercy Convent. There is still a strong history and connection to Keogh Square/St. Michael's estate from local families, and families who have been relocated to other communities.

The barracks are also important due to their links with the Easter Rising and the nearby Kilmainham Gaol. Following the Easter Rising of 1916 more than 3000 prisoners were detained in Richmond Barracks. The leaders were held in the gymnasium building, including the signatories of the Easter Proclamation and others: Eamon de Valera, Countess Markievicz, Michael Collins, Arthur Griffith, William T. Cosgrave, Eoin MacNeill, Tomas Ashe, Noel Lemass and Sean T. O'Kelly. A series of courts-martial began on 2nd May 1916, in which 187 people were tried, most of them at Richmond Barracks. A total of 90 people were originally sentenced to death, but following the execution of 14 leaders of the rising over a ten-day period, at Kilmainham Gaol, the remaining death sentences were commuted. This was, in part, due to the rising hostility of the Irish public to the British and how the rebels were dealt with.

13.7.6.1 Toponymy

Topographic names are an invaluable source of information on topography, land ownership and land use within the landscape and are of cultural heritage significance. They also provide information on history; archaeological monuments and folklore of an area. A place name may refer to a long-forgotten site and may indicate the possibility that the remains of certain sites may still survive below the ground surface. The main references used for the place

name analysis are Irish Local Names Explained by P.W Joyce (1870) and www.logainm.ie. A description and possible explanation of each placename in the environs of the proposed development area are provided in the table below.

Table 13.2 – Placename Analysis

Placename	Derivation	Possible Meaning
Inchicore	<i>Inse Chór</i>	The river meadow of O’Core (?)
Kilmainham	<i>Cill Mhaighneann</i>	The church of St. Mainen
Islandbridge	-	-
Drimnagh	<i>Droimeanach</i>	Possibly originating from <i>Drim</i> meaning ridge

13.7.7 Aerial Photographic Analysis

Inspection of the aerial photographic coverage of the proposed development area held by the Ordnance Survey (1995–2013), Google Earth (2008–2020) and Bing Maps (2021) was carried out as part of this assessment. A review of aerial photography and satellite imagery reveals that the site was previously developed, and illustrates the presence of the ten tower blocks of St. Michael’s Estate. Seven of the blocks were located on the site of the proposed development, the remaining three were located to the southeast. By 2005 three of the towers to the north of the site had been demolished. (Figure 13.9). By the time of the 2013 imagery, the remaining structures in the south of the proposed development area have been demolished. There are no significant changes to the proposed development area between 2013 and the most recent imagery (Google Earth 2020), with the north of the proposed development area remaining occupied by structures. No previously unknown features of archaeological potential were identified from the available imagery.

Figure 13.9 – Extracts from Google Earth imagery of the proposed development area (2005-2020)



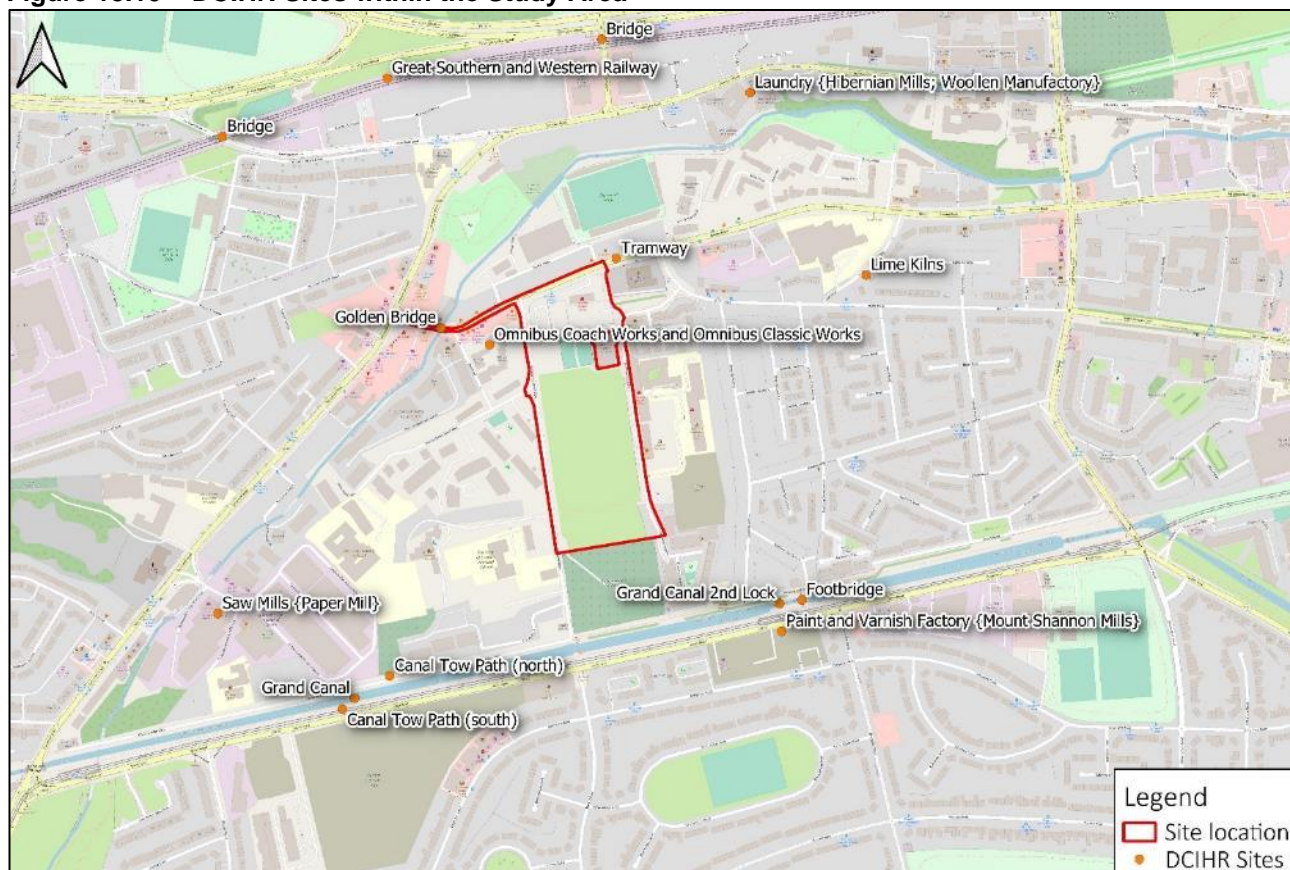
13.7.8 The Dublin City Industrial Heritage Record (DCIHR)

A review of this record has shown that there are nine sites included within the DCIHR within 500m of the proposed development area (Table 13.2, Figure 13.10).

Table 13.3 – DCIHR Sites within the Study Area

Classification	Location	Upstanding Remains	Distance from Development
Tramway	Emmet Road	Road resurfaced. No visible remains of tramlines	Immediately north
Omnibus Coach Works and Omnibus Classic Works {Tramway Depot}	Spa Road	No	c. 58m west
Canal Tow Path	Grand Cana;	No	c. 108m south
Golden Bridge	Emmet Road	Yes	c. 112m west
Grand Canal 2nd Lock	Davitt Road	Yes	c. 184m southeast
Laundry {Hibernian Mills; Woollen Manufactory}	Inchicore Road	No	c. 297m northeast
Bridge	Memorial Road	Yes	c. 302m north
Great Southern and Western Railway	Con Colbert Road	Line now largely replaced but continues in use	c. 302m north
Lime Kilns	Luby Road	No	c. 344m east

Figure 13.10 – DCIHR Sites within the Study Area



13.7.9 Field Inspection

The field inspection sought to assess the site, its previous and current land use, the topography, and any additional information relevant to the report. During the course of the field investigation the proposed development site and its surrounding environs were inspected.

Today the proposed development area is, for the most part, characterised by an open grassed area and footpaths, which originally formed the western portion of the barracks and was later occupied by social housing, including the

more recent concrete tower blocks. The whole area has now been levelled and is accessible to the public for recreation. Saint Vincent's Street West bounds the site to the west, along with a modern boundary wall. The stone wall associated with Golden Bridge Cemetery is located along the southern boundary. The eastern boundary is formed by a road that extends from Bulfin Road and separates the site from the remaining in-situ barrack buildings, to the immediate east.

There are a number of modern structures located in the northern part of the site, along with a tennis court and car parking. The northern boundary is formed by Emmet Road and the original stone wall associated with the former barracks.

No previously unrecorded specific features or areas of archaeological potential or cultural heritage significance were noted during the inspection.

13.7.10 Conclusions

The proposed development area is located at Emmet Road, Inchicore, Dublin 8. There are no recorded monuments within the proposed development area, which stands on the site of the 19th century Richmond Barracks. The nearest recorded monument is the zone of archaeological potential associated with Dublin City, which is situated c. 200m to the north-northwest (DU018-020). A Scandinavian type burial site (DU018-020272), which is located c. 395m north, is the nearest individual recorded monument. Kilmainham Gaol (DU018-125, Nat. Mon. 675) is recorded c. 430m to the west-northwest of the proposed development area and is a National Monument in State Ownership.

Archaeological monitoring of site investigations within the proposed development area was undertaken by IAC Archaeology in September 2020. Beneath demolition material relating to the former social housing that occupied the site, the remains of elements associated with the 19th century Richmond Barracks were recorded in a number of locations. Archaeological investigations to the immediate east and south also uncovered structural remains of the barracks (Licence 08E0736 Bennett 2008:466, Licence 10E0407 Bennett 2010:278). No features predating the early 19th century have been identified in the development area or its immediate environs.

The cartographic sources depict the proposed development area as undeveloped prior to the establishment of the Richmond Barracks, which are shown for the first time on Taylor's map of 1816, having been established in 1810. The surviving barrack buildings primarily border the proposed development area with a central open space. Following Independence, the barracks were used as social housing with the OS map of 1947 showing both the former barracks buildings and a newly constructed development within what was formerly the open central space (Soldier's Parade Ground) of the barracks, named Keogh Square.

The former barracks site, as a whole, possesses specific cultural heritage significance, due to its connections with the Easter Rising, as over 3000 prisoners were held here following the rising, with many put on trial at the barracks. Fourteen of the condemned rebels were taken from Richmond to their execution at Kilmainham Gaol in May of 1916. The surviving former gymnasium and the stone building to the south (both located to the east of the proposed development area) are currently in use as a visitor centre exhibiting information on the history of Richmond Barracks, including the Easter Rising, along with the later social housing projects on the site formed by Keogh Square and St. Michael's Estate.

The aerial photography and satellite imagery of the proposed development area illustrates the level of development within the overall development area throughout recent years. The most recent imagery (Google Earth 2020) shows the southern two-thirds of the proposed development area cleared of structures while the northern section is still occupied by a number of structures. The condition of the site was confirmed during field inspection.

There are a number of sites listed in the Dublin City Industrial Heritage Record within the vicinity of site; however, none of these are directly relevant to the proposed development area.

13.8 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

In summary, the proposed development will comprise a mixed-use development comprising c. 578 no. apartments, community facilities (community hub/library, creche, retail/café units) including a supermarket and public plaza fronting onto Emmet Road, including water main upgrades along Emmet Road all on a site of c. 4.68 hectares. A full description is provided in Chapter 2 of the EIAR.

A description of the project is provided in Chapter 2 of the EIAR. Further detail is provided in the Architects Design Statement.

The project (and assessment) also includes the related permitted Part 8 development (Planning Reg. Ref. 2221/21) comprising the demolition of existing structures located in the northern part of the site.

13.9 POTENTIAL IMPACT (EFFECTS) OF THE PROPOSED DEVELOPMENT

The following section provides detail on the likely significant effects of the proposed development resulting from the construction and existence of the proposed development from an archaeological and cultural heritage perspective.

13.9.1 Construction Phase

13.9.1.1 Archaeology

Whilst it is clear that the proposed development area has been subject to phases of development and disturbance, the potential for structural remains associated with the 19th century Richmond Barracks to survive beneath the existing ground surface, albeit in a fragmentary nature, has been demonstrated during the course of SI monitoring. The construction of the development will result in the removal of the subsurface remains of former Barracks and its outbuildings, which were demolished in the 20th century. As such, ground disturbances associated with the development, including enabling works (including demolition) and laying of services (including along Emmet Road), have the potential to result in a direct, negative moderate to significant impact on same.

13.9.1.2 Cultural Heritage

With the exception of the above impacts, no specific impacts upon the cultural heritage significance of the site have been identified that relate to the construction of the development.

13.9.2 Operational Phase

13.9.2.1 Archaeology

Any archaeological features on site would be resolved as part of the construction stage, prior to the operational phase of the development.

As such, no potential negative direct or indirect impacts/effects on the archaeological heritage resource have been identified as a result of the operation of the proposed development.

13.9.2.2 Cultural Heritage

It is possible that the redevelopment of the proposed development area may result in an indirect negative impact on the cultural heritage resource, in the context that the former barracks and social housing connections, may become diminished due to the new structures on site. Impacts have the potential to be moderately negative.

13.9.3 “Do-Nothing” Scenario

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

13.10 CUMULATIVE EFFECTS/IMPACTS

The proposed development, when considered with proposed/permitted developments located within 500m of the site (as set out in Chapter 1 of the EIAR), will not result in any negative cumulative impacts upon the archaeological or

cultural heritage resource. This is due to the fact that any archaeological remains encountered will either be fully preserved by record or in situ and no developments have been identified that will affect the cultural heritage of the former barracks.

13.11 MITIGATION MEASURES AND MONITORING

13.11.1 Construction Phase

13.11.1.1 Archaeology

All ground disturbances associated with the proposed development will be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the Department of Housing, Local Government and Heritage (DoHLGH) and the Dublin City Archaeologist.

13.11.1.2 Cultural Heritage

No specific mitigation measures are required relating to the cultural heritage resource at construction stage.

13.11.2 Operational Phase

13.11.2.1 Archaeology

As there are no potential impacts on the archaeological heritage of the proposed development area during operation, no mitigation is deemed necessary.

13.11.2.2 Cultural Heritage

Permanent information installations are to be created throughout the development to inform the general public of the history and cultural heritage significance associated with the location.

13.12 RESIDUAL IMPACTS

13.12.1 Construction and Operational Phase

Should the mitigation measures, recommended above, be carried out fully and successfully there will be no predicted residual negative impacts to the archaeological and cultural heritage resource by the proposed development. Information installations that provide historic and cultural heritage context to the site will have a moderately positive residual impact.

13.13 MONITORING

13.13.1 Construction and Operational Phase

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

13.14 REINSTATEMENT

13.14.1 Construction and Operational Phase

Not applicable.

13.15 INTERACTIONS

Chapter 14, Architectural Heritage, has been fully reviewed in order to prevent the replication of baseline information and ensure all relevant historic information relating to the proposed development area has been captured.

No other interactions have been identified.

13.16 DIFFICULTIES ENCOUNTERED IN COMPILING

No difficulties were encountered in the compiling information.

13.17 REFERENCES

Bennett, I. (ed.) 1987–2010. Excavations: Summary Accounts of Archaeological Excavations in Ireland. Bray. Wordwell.

British Military Archives, Kew Gardens (Blackwood Associates Architects)

Byrne, F. J 1973 Irish Kings and High Kings. London: Batsford.

Chartered Institute for Archaeologists 2020a. Standards & Guidance for Field Evaluation.

Chartered Institute for Archaeologists 2020b. Standards & Guidance for Archaeological Excavation.

Chartered Institute for Archaeologists 2020c. Standards & Guidance for an Archaeological Watching Brief (Monitoring).

Clarke, H B (ed). 1990. Medieval Dublin: The Living City. Blackrock Co Dublin: Irish Academic Press.

Clarke, H. 2002. Historic Towns Atlas of Dublin. Part 1

De Courcy, J W. 1996. The Liffey in Dublin. Dublin: Gill and Macmillan.

Department of Arts, Heritage, Gaeltacht and the Islands. 1999a. Framework and Principles for the Protection of the Archaeological Heritage. Government Publications Office, Dublin.

Department of Arts, Heritage, Gaeltacht and the Islands. 1999b. Policy and Guidelines on Archaeological Excavation. Government Publications Office, Dublin.

Dowd, M. and Carden, R. 2016 First evidence of a Late Upper Palaeolithic human presence in Ireland. Quaternary Science Reviews 139, 158–63.

Draft Dublin City Development Plan, 2022-2028

Dublin City Development Plan, 2016-2022

Environmental Protection Agency. 2015. Draft Advice Notes on Current Practice (in the preparation of Environmental Impact Statements). Government Publications Office, Dublin.

Environmental Protection Agency. 2022. Guidelines on the Information to be Contained in Environmental Impact Statements. Government Publications Office, Dublin.

MacCotter, P. 2008. Medieval Ireland: Territorial, Political and Economic Divisions. Four Courts Press, Dublin.

McQuade, M. and O'Donnell, L. 2007 'Late Mesolithic fish traps from the Liffey estuary, Dublin, Ireland,' Antiquity 81:313, pp. 569-584.

Mitchell, G. F. 1972 'Further Excavation of the Early Kitchen-Midden at Sutton, Co. Dublin,' The Journal of the Royal Society of Antiquaries of Ireland, 102:2, pp. 151-159.

National Monuments Service, Department of Housing, Local Government and Heritage. Sites and Monuments Record, County Dublin.

National Museum of Ireland. Topographical Files, County Dublin.

O'Brien, E. 1998 The Location and Context of Viking Burials at Kilmainham and Islandbridge, Dublin. In H.B. Clarke, M. Ni Mhaonaigh and R. O'Floinn (ed.) Ireland and Scandinavia in the Early Viking Age, Four Courts Press. Dublin, 203-221.

O'Meara L. 2014 From Richmond Barracks to Keogh Square

O'Meara L. 2016 Who Remembers Keogh Square?

Stout, G. and Stout, M. 1997 'Early Landscapes: from Prehistory to Plantation' in Aalen, F.H.A et al (eds) 1997 Atlas of the Irish Rural Landscape Cork University Press

Stout, M. 2017 Early Medieval Ireland 431-1169. Bray. Wordwell.

Wilde, W. 1866 On the Scandinavian antiquities lately discovered at Islandbridge, near Dublin. Proceedings of the Royal Irish Academy 10, 13–22

CARTOGRAPHIC SOURCES

William Petty, Down Survey Map of the Parish of Kilmainham, c.1655

John Rocque, A Survey of the City, Harbour, Bay, and Environs of Dublin, 1757

Ordnance Survey Maps of Dublin, 1843-1947

ELECTRONIC SOURCES

www.excavations.ie – Summary of archaeological excavation from 1970-2022.

www.archaeology.ie – Department of Housing, Local Government and Heritage website listing all SMR/RMP sites.

www.heritagemaps.ie – The Heritage Council web-based spatial data viewer which focuses on the built, cultural and natural heritage.

www.googleearth.com – Satellite imagery of the proposed development area.

www.bingmaps.com – Satellite imagery of the proposed development area.

www.richmondbarracks.ie – A Dublin City Council - Community Partnership to Restore and Commemorate the Heritage of Richmond Barracks

14.0 CULTURAL HERITAGE – ARCHITECTURAL HERITAGE

14.1 INTRODUCTION

Blackwood Associates Architects have prepared this chapter on behalf of Dublin City Council to assess the impact, if any, on the architectural heritage resource of a proposed mixed-use development at Emmet Road, Inchicore, Dublin 8 (ITM 712068, 733321, Figure 14.1). The architectural heritage input has been carried out by Kevin Blackwood FRIAI and Steven Murphy from Blackwood Associates.

Kevin Blackwood FRIAI is a Conservation Architect at Blackwood Associates Architects with a broad experience in the conservation and adaptation of historic buildings and sites. He has been Grade One accredited since 2006. As well as managing the practice, he has been responsible for the design and project management of a series of important public commissions. After graduation from UCD in 1990, he trained with the National Monuments Service of the Office of Public Works, during which time he worked on the conservation and restoration of Barryscourt Castle, a substantial medieval keep in Co. Cork, amongst other important buildings in state care. He qualified as an architect, MRIAI in 1995. In 1996 he founded the practice of Blackwood Associates, which has established itself as one of the leading conservation practices in the country. Kevin is a member of the International Council of Monuments and Sites (ICOMOS) and founding member and former chairman of the Building Limes Forum. He is a member and former chairman of Historic Buildings Committee RIAI, and former Chairman Appeals Board Panel Conservation Accreditation RIAI 2012 – 15.

Steven Murphy is an architectural technologist and historic buildings consultant with extensive experience in the survey, design, project management and execution of projects for the conservation and adaptation of historic buildings. Steven graduated with a B.Sc. Arch. Tech from Waterford IT in 2003 and joined Blackwood Associates in 2010, since when he has been responsible for a number of projects, including Richmond Barracks and Carrickmacross Market House. In 2017 he completed a PgD in Building Repair and Conservation at Trinity College Dublin.

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

- determining the presence of known archaeological and architectural heritage assets that may be affected by the proposed development;
- assessment of the likelihood of finding previously unrecorded archaeological remains during the construction programme;
- determining the impact upon the setting of known cultural and architectural heritage sites in the surrounding area; and
- suggested mitigation measures based upon the results of the above research.

The study involved detailed interrogation of the historical background of the proposed development area. This included information from the Record of Monuments and Places of County Dublin, the Dublin City Development Plan 2016–2022, the Draft Dublin City Development Plan 2022-2028, the topographical files of the National Museum of Ireland, and cartographic and documentary records. Inspection of the aerial photographic and satellite imagery coverage of the proposed development area held by the Ordnance Survey, Bing Maps, and Google Earth has also been carried out. Field inspections have been carried out by the Conservation Architect in an attempt to identify architectural heritage within the proposed development area.

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

14.2 LEGAL AND PLANNING FRAMEWORK

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

- National Monuments Act, 1930 to 2014;
- The Planning and Development Acts, 2000 (as amended);
- Heritage Act, 1995, as amended;
- Draft Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), 2017, EPA;
- Guidelines on the Information to be Contained in Environmental Impact Statements. Dublin. Government Publications Office, 2022, EPA;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht, and Islands; and
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000.
- Architectural Heritage Protection: Guidelines for Planning Authorities, 2011, (formerly) Department of Arts, Heritage and the Gaeltacht
- Dublin City Development Plan 2016-2022;
- Draft Dublin City Development Plan 2022-2028.

14.2.1 Consultation

During scoping and research for the assessment and EIAR, a number of statutory and voluntary bodies were consulted to gain further insight into the cultural background of the receiving environment and study area, as follows:

- Department of Housing, Local Government and Heritage (DoHLGH)– the Heritage Service and Policy Unit, National Monuments and Historic Properties Section: Record of Monuments and Places; Sites and Monuments Record; Monuments in State Care Database; Preservation Orders; Register of Historic Monuments;
- National Museum of Ireland, Irish Antiquities Division: topographical files of Ireland; and
- Dublin City Council: Planning Section.
- Dublin City Council: Conservation Section.

14.2.2 Definitions

In order to assess, distil and present the findings of this study, the following definitions apply:

‘Cultural Heritage’ where used generically, is an over-arching term applied to describe any combination of archaeological, architectural, and cultural heritage features, where –

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

14.2.3 Policy

The application site is within the administrative area of Dublin City Council and the following plans have been considered in this study:

- Dublin City Development Plan 2016-2022
- Draft Dublin City Development Plan 2022-2028

14.2.4 Guidance

A range of guidance has been published that is of relevance to the proposed development. This includes guidance on environmental impact assessment in general and guidance in relation to the protection of architectural heritage.

- Advice Notes on Current Practice (in preparation of Environmental Impact Statements), 2003, EPA
- Draft Advice Notes on Current Practice (in preparation of Environmental Impact Statements), 2015, EPA
- Guidelines on the information to be contained in environmental impact assessment reports (May 2022), EPA
- Guidelines for the Assessment of Architectural Heritage Impacts on National Roads Schemes (2005).
- Architectural Heritage Protection Guidelines for Planning Authorities (2004 and 2011)

14.3 METHODOLOGY

This study determines, as far as reasonably possible from existing records and site inspection, the presence of structures of architectural heritage significance in the vicinity of the proposed development using appropriate methods of study and assesses the potential effects of the proposed development on this architectural heritage. Desk-based assessment is defined as a programme of study of the historic environment within a specified area or site that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic and electronic information in order to identify heritage structures, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage structures. This leads to the following:

- Determining the baseline conditions of the site and its environs, including identification of known built heritage sites that may be affected by the proposed development.
- Identifying the sensitivity of the built heritage sites that may be affected by the proposed development
- Predicting the magnitude of likely changes to the baseline receiving environment, notably the identified built heritage sites
- Determining the significance of effects, taking into account the sensitivity of receptor and the magnitude of the effect, including the potential effects upon the setting of known architectural heritage sites in the surrounding area (receiving environment).
- Identifying and assessing appropriate mitigation measures based upon the results of the above research, including alternatives.
- Assessing the significance of residual effects, taking account any mitigation measures.

14.3.1 Architectural Heritage

Research for this report was undertaken in two phases. The first phase comprised a paper survey of all available historical, and cartographic sources. The second phase involved a field inspection of the site.

14.3.2 Paper Survey

This is a document search. The following sources were examined and a list of areas of archaeological, architectural and cultural heritage potential was compiled:

- Sites and Monuments Record for County Dublin;
- National Inventory of Architectural Heritage (NIAH);
- Register of Historic Monuments;
- Cartographic and written sources relating to the study area;
- Documentary sources
- Dublin City Development Plan 2016–2022;
- Draft Dublin City Development Plan 2022-2028;
- Dublin City Council Record of Protected Structures
- Aerial photographs;

- The Dublin City Industrial Heritage Record (DCIHR); and
- British Military Archives

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

National Inventory of Architectural Heritage (NIAH) provides a comprehensive catalogue of significant architectural heritage structures within Ireland. While inclusion in the inventory does not provide statutory protection to a structure it is used to advise local authorities on compilation of their Record of Protected Structures.

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

Cartographic sources are important in tracing land use development within the development area as well as providing important topographical information on areas of archaeological potential and the development of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape. The analysis also aids with the construction history of the site from the time on which the site was first development up to the present day.

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

Development Plans contain a catalogue of all the Protected Structures and archaeological sites within their jurisdiction. The Dublin City Development Plan (2016–2022) and Draft Dublin City Development Plan 2022-2028 was consulted to obtain information on architectural and cultural heritage sites in and within the immediate vicinity of the proposed development area.

The urban setting within and surrounding the study area were searched in the list of protected structures in the development plan to assess the proximity and potential impact of the Proposed Development on such structures. The development plan also outlines policies and objectives relating to the protection of the archaeological, historical and architectural heritage landscape of the city.

The Policies set out in the Dublin City Council Development Plan 2016-2022, CHC1 to CHC 46 were consulted in the assessment.

The Policies set out in the Dublin City Council Development Plan 2022-2028, BHA1 to BHA25 were consulted in the assessment. (Refer to Appendix 1 description of policies)

Protected structures, structures listed on the NIAH and buildings of a historical note within 100m of the Proposed Development are included here for the purposes of assessing impact of the Proposed Development on their setting.

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

The Dublin City Industrial Heritage Record (DCIHR) makes recommendations for sites to be added to the list Record of Protected Structures (RPS) in the life of the City Development Plan and is maintained by Dublin City Council DCC. It is a policy of Dublin City Council to implement the relevant recommendations of the Dublin City Industrial Heritage Record (Policy FC68).

British Military Archives

Research obtained for the Richmond Barracks Restoration project 2016 was also used to inform the development of the site from when ownership was transferred from the previously land owner (William Smith) to the British Military in the early 19th century.

14.3.3 Site Inspections

A series of external and internal inspections relating to the entire existing architectural heritage assets were undertaken during 2021 and early 2022. External site inspections were carried out with regard to the assessment of the architectural heritage of the surrounding area, taking cognisance of the potential implications of the development on the surviving architectural heritage landscape and the character of the area. Inspections were undertaken to assess the current condition and heritage significance of the existing architectural heritage assets within the receiving environment of the proposed development site.

The field inspection entailed:

- Walking the proposed development and its immediate environs.
- Noting and recording the presence of features of architectural significance, relating to the former Barracks and latter Christian Brothers School as well as additional structures in the vicinity including Golden-Bridge Cemetery, St. Michael's Church, Golden-Bridge House and School, and the brick terraces along Emmet Road and Inchicore.
- Verifying the current use and condition of any historic structures including Protected Structures.
- Assessing the nature and condition of the remaining section of boundary wall at the Norther West corner of the site

14.3.4 Description of Effects/Impacts

The assessment being performed using this classification will be used to inform the assessment carried out under the EIA Directive, which will be performed using the descriptions of effects set out in the EIA 2022 Guidelines, i.e. positive/negative, significant/moderate etc.

It should be noted that whilst impact levels and definitions are applied consistently to built heritage, effects on sites that are subject to statutory protection are considered to be more significant than sites / structures not subject to statutory protection, as the statutory protection is an indicator that a structure has been identified by the planning authority as being of significant architectural heritage importance.

Definitions of effects (as outlined in the Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes), are included in Table 14.1 below. These have been supplemented with the additional definitions of effects as per the most recent EPA guidelines (2022).

Table 14.1 – Definition of levels of significance

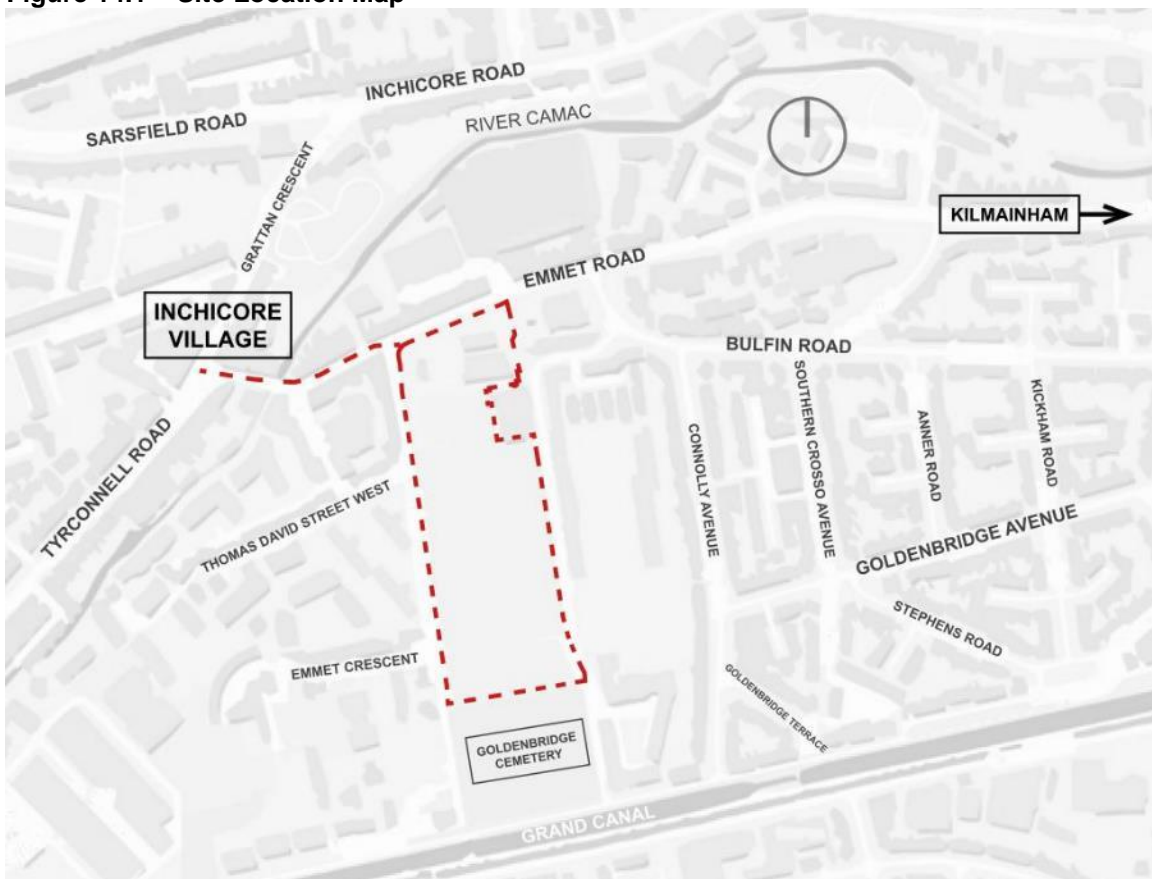
Type of effect	Definitions relating to sites of architectural heritage significance
Profound	An effect that obliterates sensitive characteristics
Very Significant	Effects which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its or sensitivities. .
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Imperceptible	An effect capable of measurement but without significant consequences.

14.4 RECEIVING ENVIRONMENT (BASELINE SCENARIO)

The proposed development area is located within site of the former 19th century Richmond Barracks complex. The site is located north of the Grand Canal, immediately south of Emmet Road and east of Inchicore Village. The development area, when complete, will occupy approximately half of the original barracks footprint and will be constructed largely on the soldier’s parade ground located on the western half of the former barracks site.

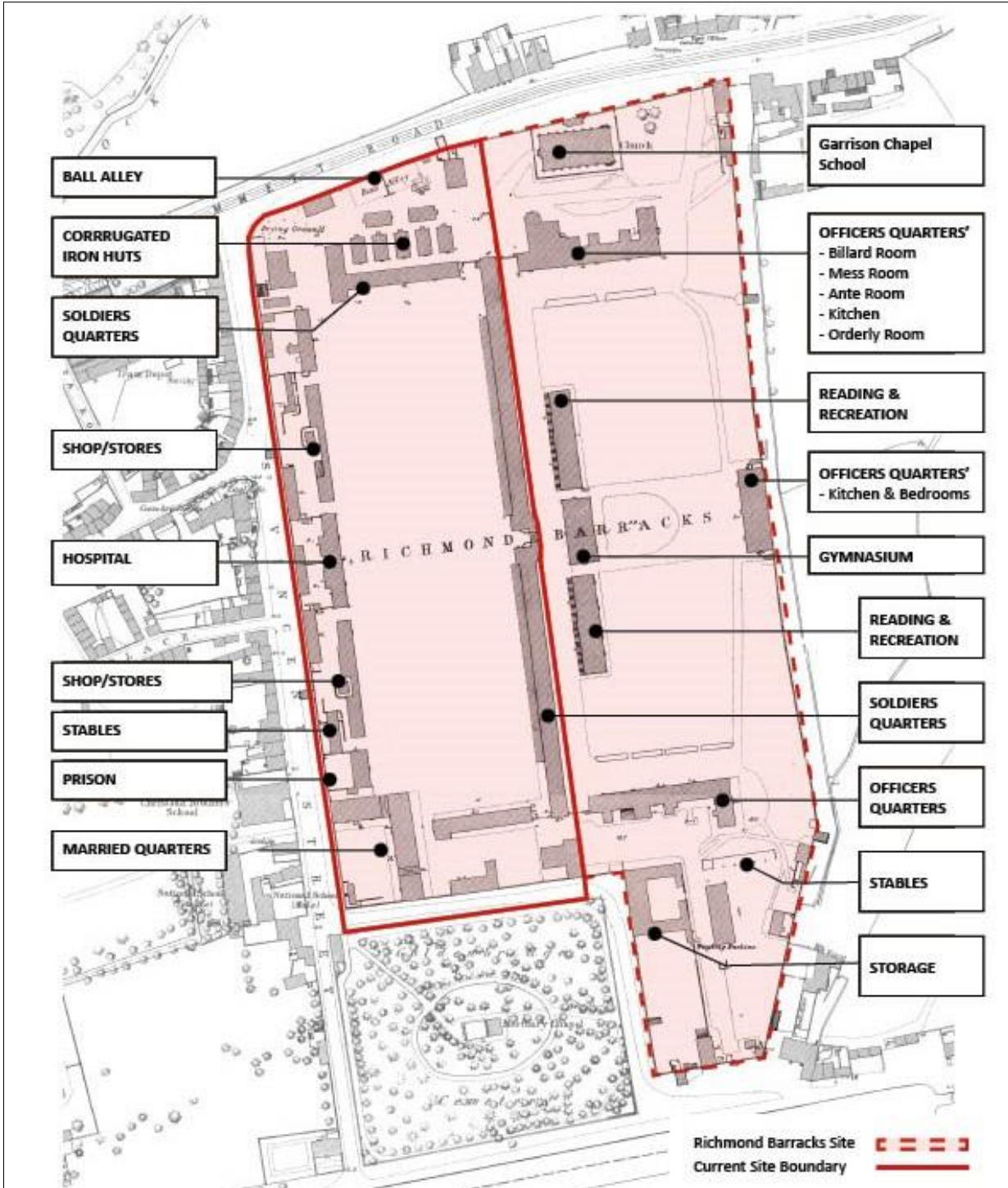
The site is bounded to the east by the remaining three structures of Richmond Barracks, a HSE Primary Care Centre and Community Nursing Unit, to the south by Goldenbridge cemetery and to the east by St. Vincent’s Street West. Emmet Road runs on an east-west axis and forms the northern boundary of the site. A number of modern buildings are located on the northern section of the site, all of which are to be demolished, with the exception of the Sports Centre situated in the north-east quadrant of the site; the boundary line excludes this building.

Figure 14.1 – Site Location Map



Work on Richmond Barracks began in 1810, during the Napoleonic wars, when the 4th Duke of Richmond was Lord Lieutenant. The site area covered 23 acres and the stone for the buildings was quarried on site. Warm springs were discovered in the quarrying operations and there were a number of fashionable spas here, from which the nearby Spa Road derives its name. The quarry and spa are shown on the Taylor map of 1816. Originally built to defend the capital, the threat of invasion disappeared after Waterloo and the barracks became a recruiting centre. Almost every British regiment spent a year here between the first occupation in 1814 and its handover to the Free State in 1922. It was used mainly for infantry, housed 76 officers, 1600 men, a small hospital and some stables. A garrison church (now St. Michael’s Church), still standing and in use, was built by 1857. Battalions were dispatched from here to the Crimean and Boer wars.

Figure 14.2 – OSI City of Dublin Map 1889

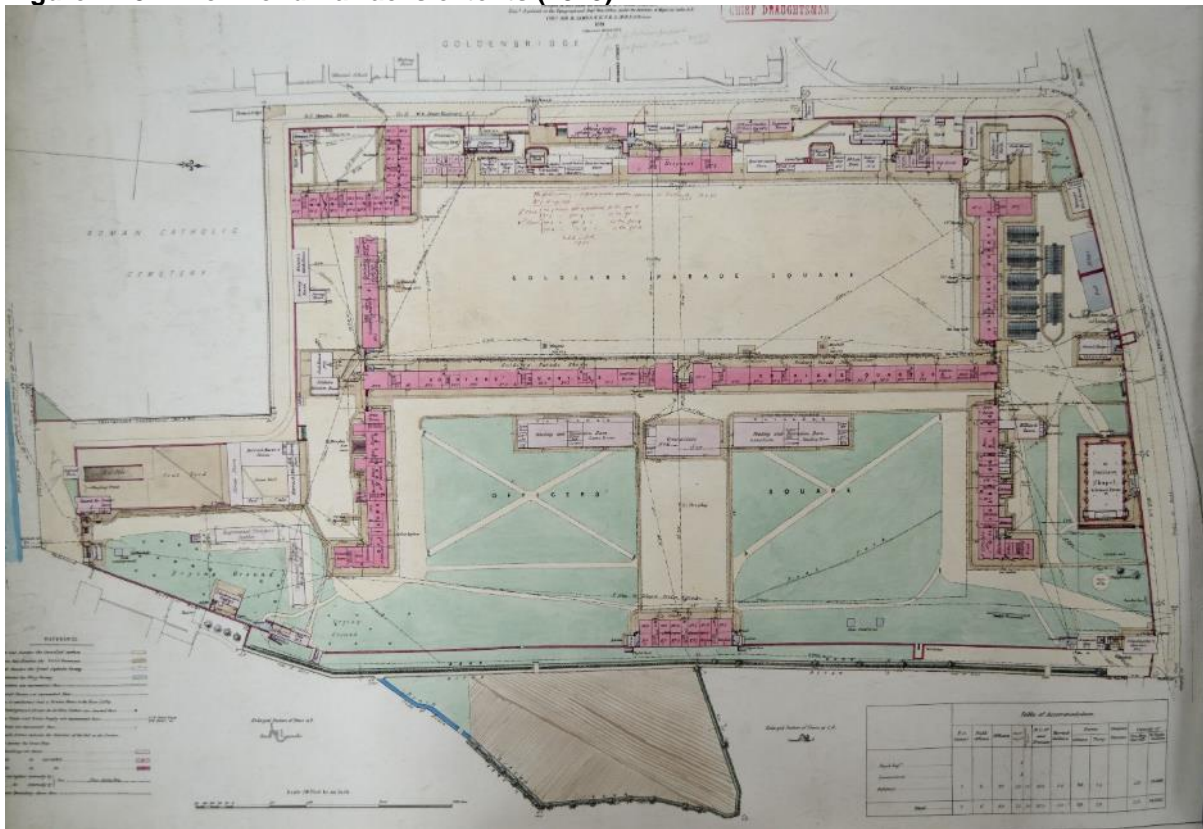


The barracks were built in H-configurations with a north and a south gate. The three remaining buildings immediately east of the development area were constructed in the 1860's and 70's. The first of the two outer stone-built buildings (Reading and Recreation) was opened in 1864, followed shortly by the second. The brick-built (Gymnasium) building between the two stone buildings was built during the 1870s. Sections of the boundary wall remain, together with a mortuary chapel and the Garrison Chapel now St. Michael Church.

In 1922, the Free State Army took over from the departing British Army. Shortly afterwards, Richmond Barracks was handed over to Dublin Corporation for use as housing at which point the name of the Barracks was changed to Kehoe Barracks, in honour of Commandant Tom Kehoe of the National Army who died in the Irish Civil War. A housing scheme, known as Keogh Square, was constructed on the western side of the barracks site in the 1930's on the

former soldiers' Parade Grounds. Many of the Barracks buildings remained standing around Kehoe Square and would remain until the latter half of the 20th century.

Figure 14.3 – Richmond Barracks extents (1879)



The majority of the barracks buildings including Keogh Square were largely demolished by the 1970's to be replaced by the St Michael's Estate flats complex. The flat complex was demolished between 2000 and 2013. Only three of the barracks' buildings, together with a section of the perimeter wall, mortuary chapel and the Garrison Chapel (now St. Michael's Church) survive to the present day. The surviving barracks buildings are located to the east of the proposed development and the part of perimeter wall is located at the North West corner of the development site.



Figure 14.4 – Richmond Barracks extents (1879) Soldier's Parade Ground



Figure 14.5 – Richmond Barracks extents (1879) Officer's Quarters and Gymnasium

The remaining buildings are considered to be historically important because they are almost all that survives of one of Dublin's largest early 19th century military barracks complexes and because of their significance in the context of the 1916 Rising. The brick central building, formerly the barracks gymnasium, was used to detain some of those arrested during the Rising. The leaders of the rising were court-martialled in Richmond Barracks and taken from here to Kilmainham Gaol to be executed. The gymnasium and the stone building to the south are currently in use as a

visitor centre exhibiting information on the history of Richmond Barracks, Keogh Square and St. Michael's Estate. The stone building to the north of the Gymnasium is part of a HSE Primary Care Centre.

Figure 14.6 – Image taken over the site of the former barracks c.1980



The Aerial image above was taken c.1980 and shows the 1970's St. Michael's Estate flat complete after its construction. The 1930's Keogh's Square Housing been demolished by 1969 and replaced by the flats seen in the image. This was a social failure and has now been demolished, the last block demolished in 2013. The surviving barracks buildings, mortuary chapel and boundary walls are visible on the image. The surviving three barracks buildings were in use as school by the Christian Brother's from 1928 until 2006.

Playing pitches are visible to the east and north of the buildings. In 2006 the school was acquired by Dublin City Council; the northern single-storey stone building was acquired by the HSE. The northern building was redeveloped by the HSE together with a large section of land the north and east, into what is now a HSE Primary Care Centre. The remaining two building have been restored and adapted in 2016 to commemorate the significance of the Barracks site.

Figure 14.7 – Image taken of the western elevation of Gymnasium building in 2016

The only surviving structures and fabric from the original Richmond Barracks within the proposed site boundary or in the immediate vicinity of the site consist of the three buildings facing onto Patriots Path (the former Officers' Quarters and Gymnasium), The Garrison Church in the north east corner of the site and a small section of northern and western boundary wall onto Emmet Road and St. Vincent's Street West. A section of the boundary wall is located within the proposed development site.

In addition to the buildings within the proposed site boundary or in the immediate vicinity of the site other structures associated with the barracks remain in the wider context including, the remanence of the eastern barracks boundary wall further east of the site, to the rear of the housing development on Connolly Avenue and a mortuary building along the same wall, now encompassed in the back Garden of the house at No. 1 Connolly Avenue.

The historically significant Goldenbridge Cemetery (Protected Structure) is located to the south and Golden Bridge Convent and School buildings to the west of the site.

Two of the remaining three buildings have recently been restored and adapted in 2016 to commemorate the significance of the Barracks site. The third building has been incorporated into the HSE Primary Care Unit.

None of the protected structures or historically significant fabric will be demolished. Section of stone will be removed from part of the remaining boundary wall to the North West in order to make pedestrian routes as part of the development.

The former Gymnasium (central red-brick building) which is flanked by the former Officers' Quarters (single-storey limestone buildings) to the north and south were first listed for protection in 1991 Development Plan. The three structures form a long terrace, ranged north-south, and occupy much of the eastern side of Patriots Way. The buildings are considered to be historically important because they are almost all that survives of one of Dublin's largest early nineteenth-century military barracks complexes and because of their significance in the context of the 1916 Rising.

The brick central building, formerly the barracks gymnasium, was used to detain some of those arrested during the Rising. The leaders were court-martialed in Richmond Barracks and taken from here to Kilmainham Gaol to be executed. The building continued to be used as a gymnasium while in use as a Christian Brothers School, and today it is in use as an exhibition area

Figure 14.8 – Image taken 2106 of the eastern elevation of Gymnasium building



The Gymnasium Building is a freestanding, single-storey, double-height structure, set on a granite ashlar plinth. It has a single-span, pitched roof with the ridge parallel to the principal elevations and with gables at both ends. The roof covering is of natural slate. The building is seven bays long and was constructed in the 1870's as the barracks gymnasium. It is a simply composed structure, of red brick, with a series of bays formed by square-headed recesses. Decoration is achieved by the restrained use of dogtooth, scalloped and bull-nosed brickwork, and the block is framed at each corner with brick pilasters. The windows are set within the recesses, in brick arched openings with glazed yellow bull-nosed brick arches and granite cills. The entrance is on the south elevation and is now accessed through a glazed, flat-roofed, single-storey link building that provides internal circulation between the former Gymnasium and the Officers' Quarters to the south.

Internally, the southern end of the building is two-storey, as shown by the disposition of the openings on the southern elevation (three windows lighting the first floor and two flanking the main entrance door). The interior consists of one large exhibition and event space located in what would have been the main gymnasium space. A smaller two-storey section to the south currently accommodates the entrance hall, and office, toilets and an upper room. The roof structure is exposed internally as it would have done originally, the walls are plastered and painted and the floor is polished concrete which was constructed as part of the works carried out 2016.

As part of the works carried out 2016, the Octagon on the roof of the Gymnasium was reinstated. Historic drawings and photographs were used to help recreates this large element that was removed at some point in the early 20th century. The reinstatement of the Octagon and the construction of the new Link building were two of the most significant interventions made to the buildings under the 2016 phase of works. To the east, a new Landscaped garden was constructed as an external semi-public open space.

The former Officers Quarter's building located south of the Gymnasium, like the matching building to the north, is a freestanding, single-storey, double-height building, built of limestone ashlar in c. 1860. It is twelve bays long on its principal elevation, with granite detailing and a central pedimented two-bay breakfront. This breakfront may have formed the original principal entrance to the building when it was used as part of the barracks. The tympanum of the central pediment has a circular niche with a cut stone reveal. A carved stone crest with the motto of the Christian Brothers was inserted in 1929. The building has a single-span pitched roof with the ridge parallel to main elevation, hipped to the south end and gabled to the north, with natural slate roof covering and terracotta hip and ridge tiles. The roof of the two-bay breakfront is a single-span pitched roof gabled to the front. The building has a stone plinth and a plain frieze-cornice. The front elevation forms an arcade of round-headed openings. Along with the matching building further north, this block is of particular architectural interest as an example of military architecture, its strong character emphasised by its stripped classical composition. The main entry to this building is through the new glazed link building.

The arcade is articulated by a granite moulded string course at the level of the springing point of the arches. Openings and quoins are subtly emphasised by the use of ashlar and each opening in the arcade has an inner recessed architrave of red brick into which the window openings are set. All windows have granite cills and their original timber sashes, which were repainted in 2016. Both Officers Quarters buildings formerly housed the Officer's mess and the library/reading room for the barracks. The interiors were refitted to adapt the buildings for school use in the 1920s. A small two-storey section, originally used as living accommodation, is located at the south end of the southern building and now contains an office and store.

When the interior was reordered and converted into use as a school, a simple layout was adopted – a long access corridor running the full length of the west side of the building, lit by the tall sash windows in the arcade, with classrooms to the east. The partition wall between the corridor and the classrooms is a beautiful glazed partition wall, typical of early Free State interior architecture. The classrooms are two-bays wide and lit by tall sash windows on the east side. While they are in some cases separated by solid walls, in others they are divided by fine purpose-made folding door partitions. Interiors have parquet flooring and the walls and ceilings are plainly executed, plastered and painted. As part of the 2016 phase of works the classrooms were reimagined as exhibition areas to commemorate the buildings lifespan from Rooms for use by Military Officers to Classrooms use by the Christian Brothers.

The matching building to the north is identical externally, however was more radically changed for use as part of the HSE Primary Care centre constructed on the Site in 2006. Its primary access is through a sliding door inserted into its central breakfront. The interior of the building was not inspected as part of this report.

The section of the boundary wall to the north east corner is of coursed random rubble calp limestone. The wall varies in height ranging from 1.2m along Emmet Road to 4.0m approximately on St. Vincent's Street west. The condition of the wall appears to be reasonable. There is a slight lean in the direction of the slope the curvature of the wall. Some areas of stone have receded.

Figure 14.9 – Remaining section of the Barracks boundary wall at the northwest corner of the site



14.4.1 Cartographic Analysis

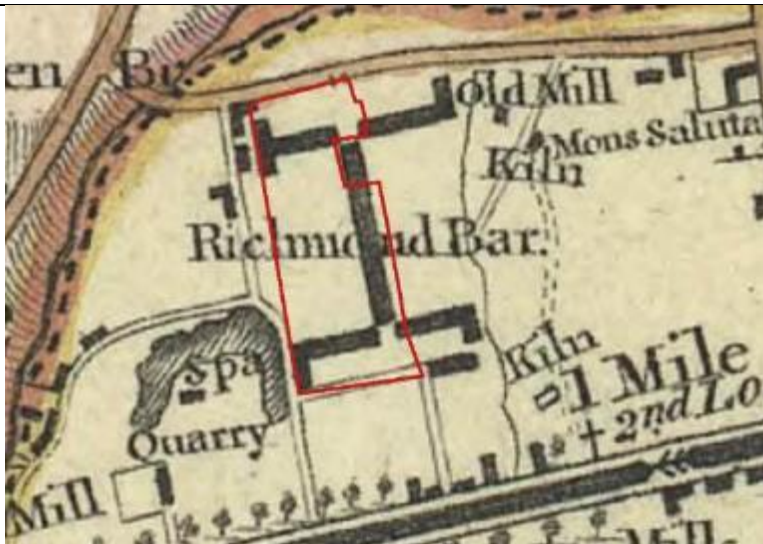
Figure 14.10 – Extract from Rocque’s map of 1757 showing the approximate location of the proposed development area



John Rocque, A Survey of the City, Harbour, Bay, and Environs of Dublin, 1757

At the time of this map the River Cammock flows in two channels, the northern of which appears to serve two mills, one at Goldenbridge and another on the Inchicore Road. The two channels re-join at Kilmainham to the east. The proposed development area appears to be located within a number of agricultural fields to the south of the Kilmainham Road. No features or structures are shown within the approximate location of the proposed development area. The lands where the Barracks was to be built upon were owned by Mr. William Smith up until their purchase by the British Military 1809. The lands where Golden-Bridge Cemetery now lie were retained by Smith to be acquired by the Sisters of Mercy. By January 1810 Tenders for the construction of the Barracks appeared in newspapers and notice was also given in Parliamentary Papers dated 1810.

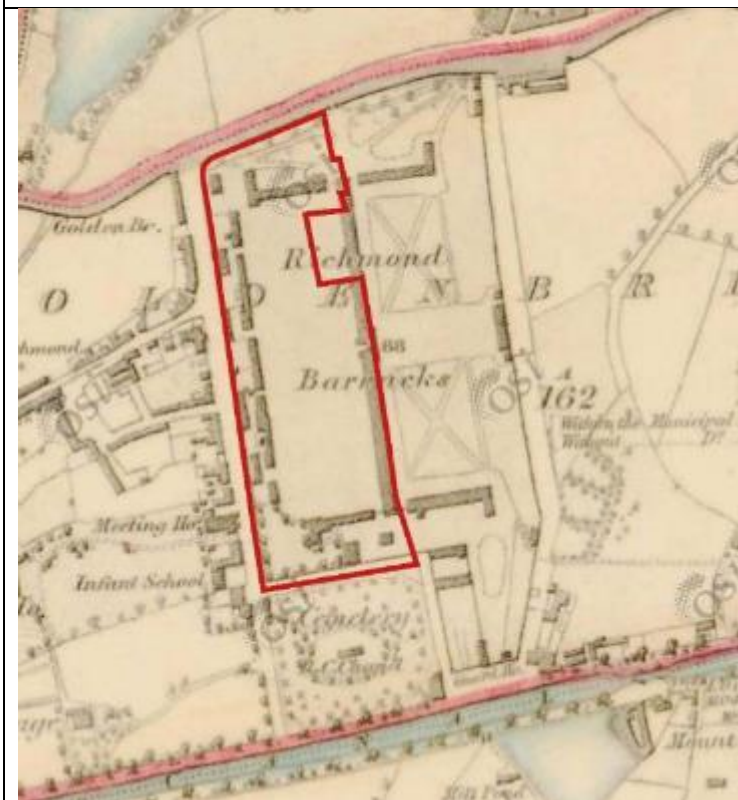
Figure 14.11 – Extract from Taylor’s map of 1816 showing the approximate location of the proposed development area



John Taylor, Map of the Environs of Dublin, 1816

Richmond Barracks is depicted within the proposed development area for the first time. In the immediate area, a quarry is shown to the southwest and a number of kilns are shown to the east, along with an 'old mill'. The Grand Canal has been constructed to the south of the site by the time of this map, as has Kilmainham Gaol (DU018-125) which is labelled as 'County Goal'. The barracks were built in H-configurations with a north and a south gate. The majority of the soldier's quarters of the Barracks appears to have been completed by this stage. Additional soldiers and officers' quarters were to be constructed in the second half of the 19th century.

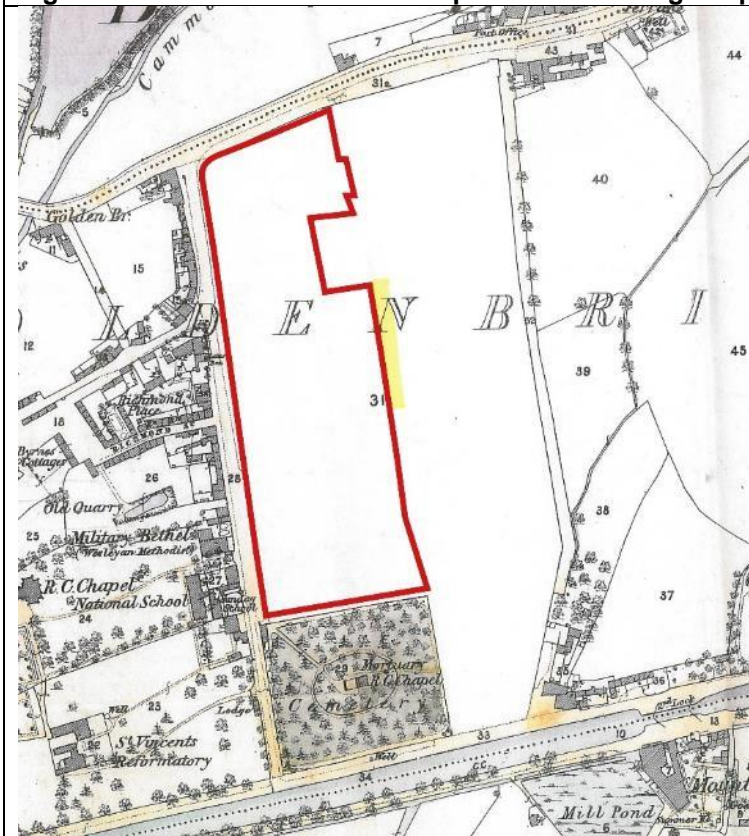
Figure 14.12 – Extract from the First Edition OS map of 1843 showing the proposed development area



This is the first accurate map of the proposed development area. It shows the barracks occupying a large area including the proposed development area. The structures of the barracks largely border the site with a large open area depicted in the centre of the site. The cemetery is shown to the south for the first time, with a Roman Catholic Chapel marked within it. In the wider area, a number of Mills are depicted powered by the River Cammock.

First edition Ordnance Survey map of 1843, scale 1:10,056

Figure 14.13 – Extract from OS map of 1864 showing the proposed development area

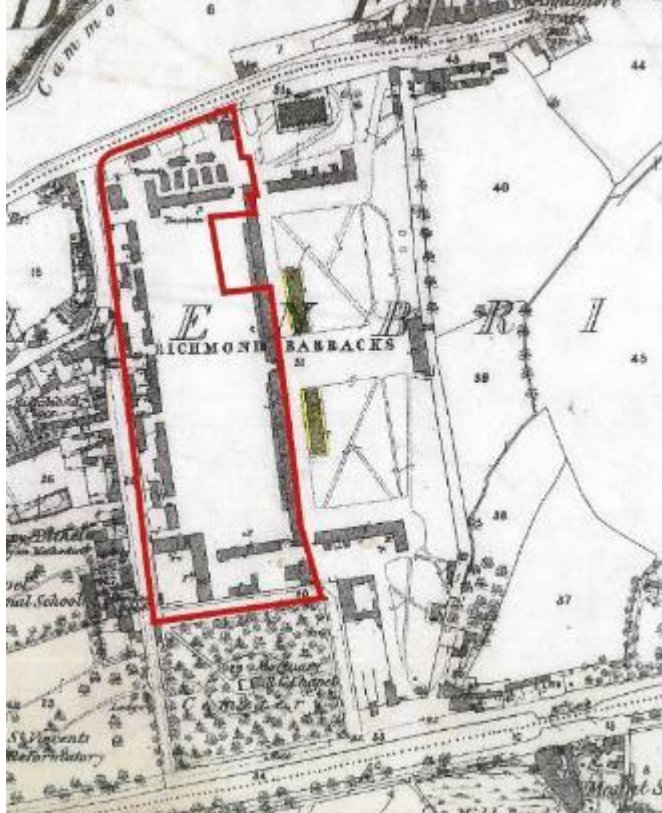


On this series of maps the Barracks has been left blank, presumably for security reasons.

We can see St. Vincent's Reformatory at the South of the map.

Ordnance Survey Map, 1864, scale 1:10,056

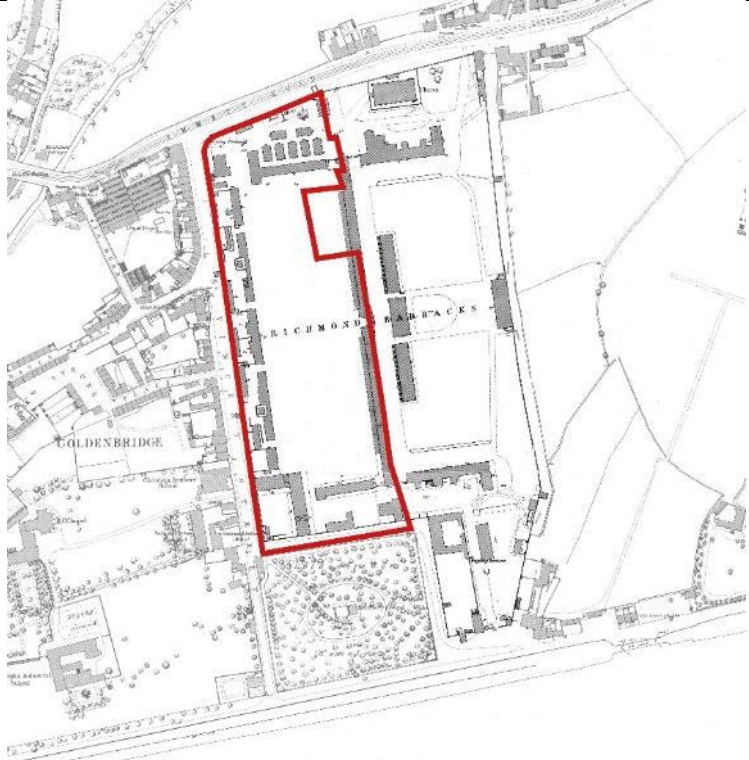
Figure 14.14 – Extract from OS map of 1872 showing the proposed development area



The time of this map, there have been a number of additional structures constructed in the north of the proposed development area and a significant large structure in the southwest corner of the proposed development area.. St. Michael's Church, which was formerly the garrison church for Richmond Barracks is shown to the immediate east having been built in 1845.

Second Edition Ordnance Survey Map, 1872, scale 1:10,056

Figure 14.15 – Extract from OS map of 1889 showing the proposed development area

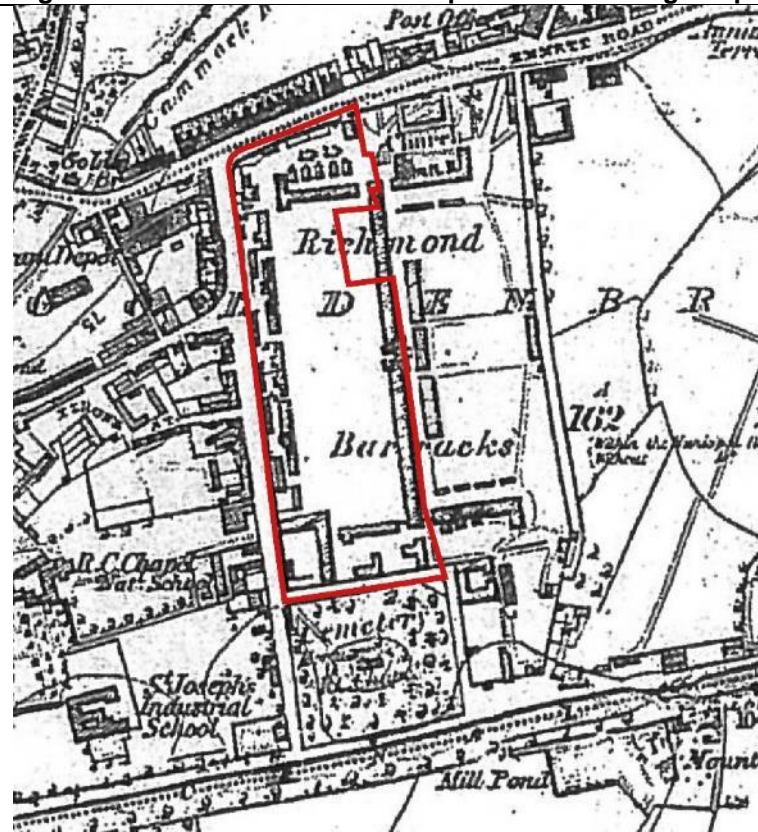


This map shows the Richmond Barracks as largely unchanged with the majority of the structures depicted in the western and northern extents of the proposed development area.

At the north of the proposed development area, a ball alley and an area annotated as 'drying ground' are shown. The road to the immediate north of the proposed development area is labelled 'Emmet Road' for the first time and a tramway has been established along its route.

Second Edition Ordnance Survey Map, 1889, scale 1:10,056

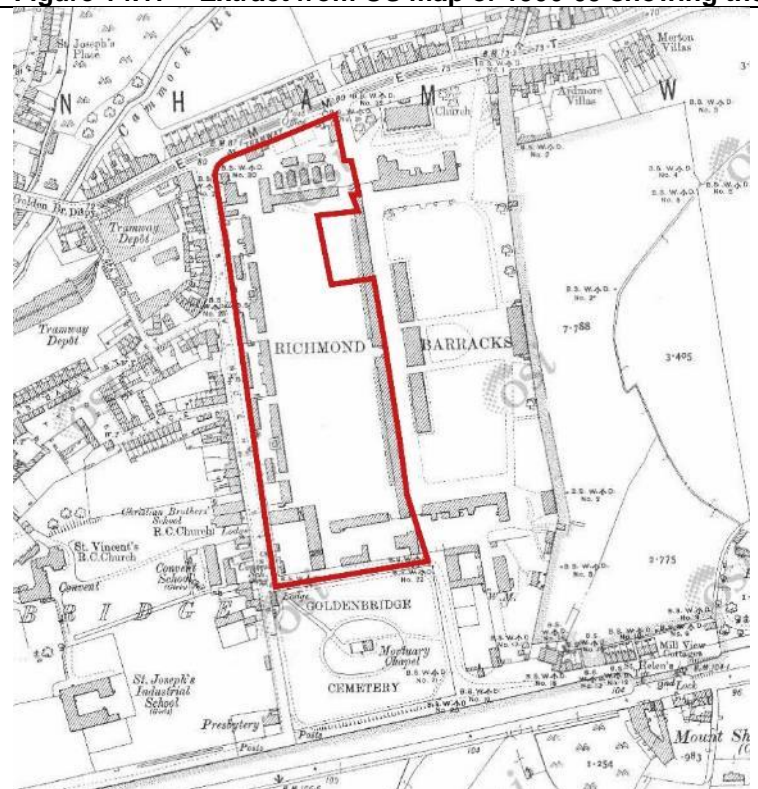
Figure 14.16 – Extract from OS map of 1897 showing the proposed development area



The most notable development that had taken place at the time this map was produced has been the construction of the terrace of redbrick houses to the north of Emmet Road. The barracks complex has largely remained as is since the construction of the brick Gymnasium and the addition of soldiers huts to the northern side of the soldier's quarters

Second Edition Ordnance Survey Map, 1897, scale 1:10,056

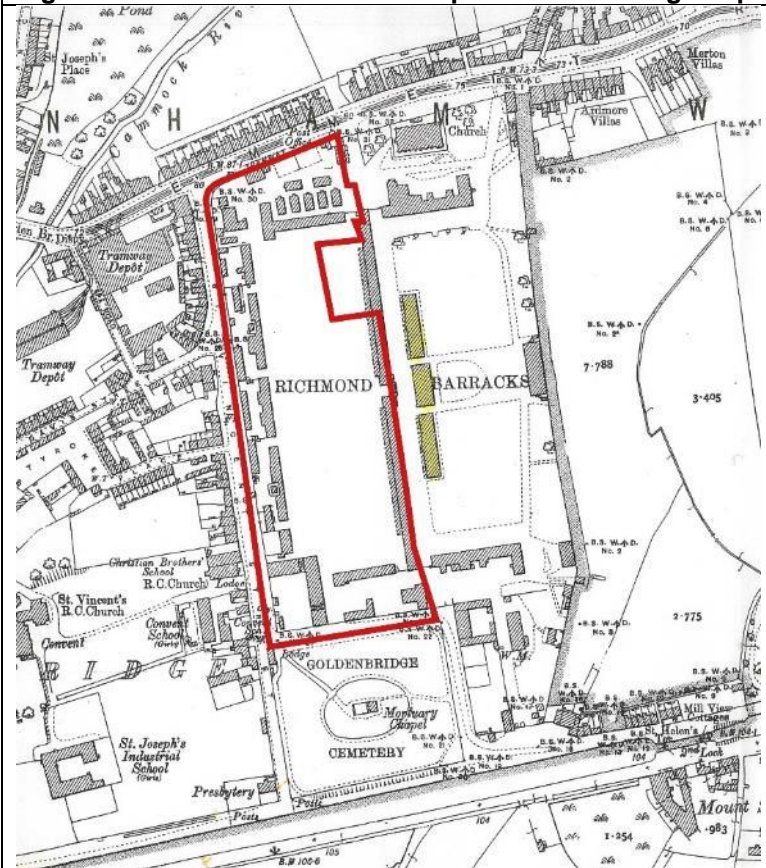
Figure 14.17 – Extract from OS map of 1906-09 showing the proposed development area



There is no significant change to the proposed development area by the time of this map in 1906-9.

Ordnance Survey Map, 1906-9, scale 1:2500

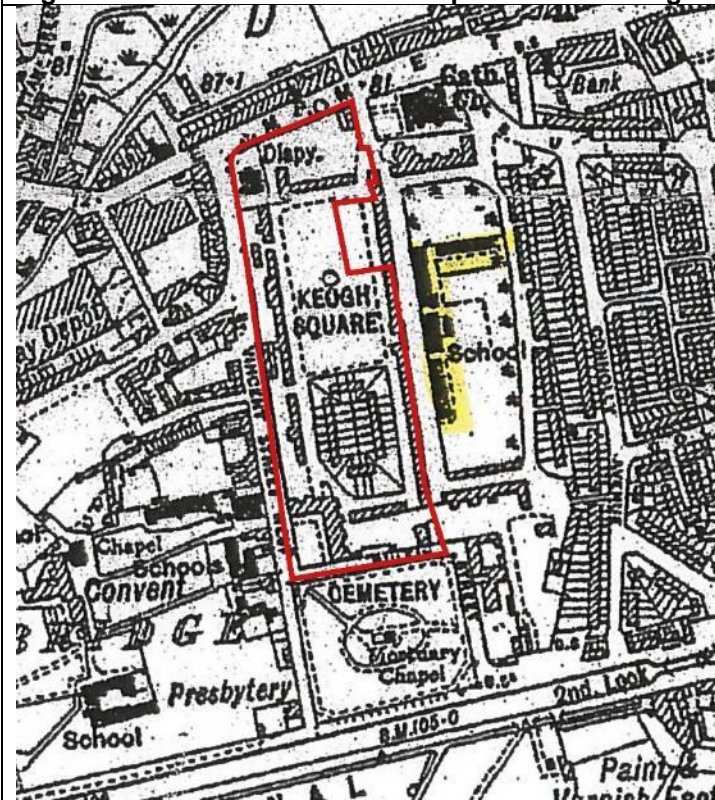
Figure 14.18 – Extract from OS map of 1911 showing the proposed development area



There is no significant change to the proposed development area by the time of this map in 1906-9.

Ordnance Survey Map, 1911, scale 1:2500

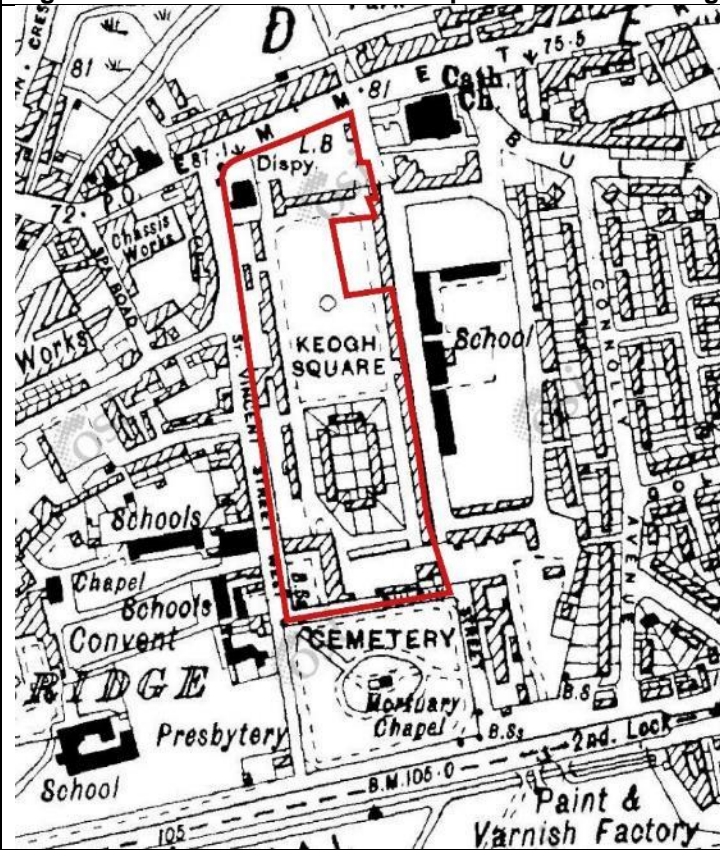
Figure 14.19 – Extract from OS map of 1935 showing the proposed development area



At the time of the publication of the map, which is an updated version of the 1906-09 map, a 'School' is noted along the line of the three present-day Barracks buildings. These structures were historically used as Soldier's Quarters and Gymnasium. The maps also show that the Keogh Square social housing had been constructed. This map indicates the first sign of the change of use from the military Barracks buildings. The Barracks became known as Keogh Barracks and the School was established here by the Christian Brothers in 1929 and would operate as a Christian Brothers School (CBS) until 2006.

Ordnance Survey Map, 1935, scale 1:10560

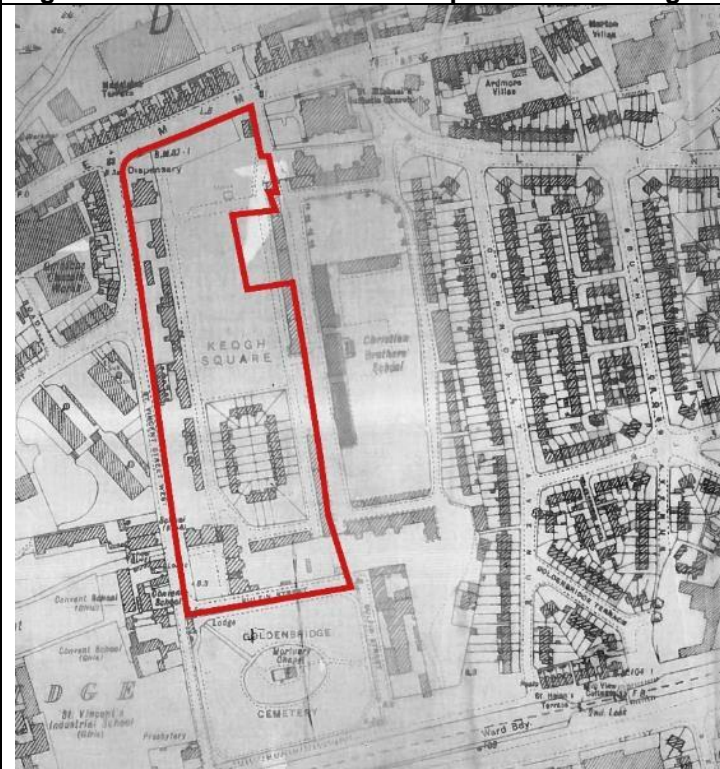
Figure 14.20 – Extract from OS map of 1906-09 showing the proposed development area



The map shows a dispensary in the north of the proposed development area, whilst the former barracks buildings and a newly constructed central development are named 'Keogh Square': a social housing development. The Barracks buildings to the immediate east of the proposed development area are in use as a school at this time.

Third Edition Ordnance Survey Map, 1947, scale 1:10,056

Figure 14.21 – Extract from OS map of 1966 showing the proposed development area



Here we can see significant portions of the barracks have been demolished, including the bell tower and a large portion of the central and northern soldier's quarters.

Third Edition Ordnance Survey Map, 1966, scale 1:10,056

14.4.2 Architectural Heritage

The Planning and Development Act, 2000 (as amended) requires each planning authority to compile and maintain a Record of Protected Structures (RPS). The RPS record all structures within a planning authority's functional area which in the opinion of the planning authority form part of the architectural heritage and which are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. This record is a mechanism for the statutory protection of the architectural heritage and forms part of each planning authority's development plan. The National Inventory of Architectural Heritage (NIAH) survey may result in further revisions to the RPS.

The three remaining barrack buildings to the east of the development site are Protected Structures. The structures are the only surviving buildings currently relating to the Barracks with the exception of a former mortuary chapel. The buildings and boundary walls are grouped as one Protected Structure Ref. No. 8705 "*Former St. Michael's CBS building and stone flanking pavilion buildings, formerly known as Richmond/Keogh Barracks, including rubble stone boundary walls*".

St. Michael's church, formerly The Garrison Chapel and once inside the walls of the Barracks is also a Protected Structure, Ref. No. 2639. Other protected structures in the immediate vicinity of the development site include Goldenbridge Cemetery including walls, gates and lodge, St. Vincent's Street West, (Ref. No. 7818), Goldenbridge Chapel, St. Vincent's Street West, (Ref. No. 7817) and the Sisters of Mercy Convent, Goldenbridge (Ref. No. 7816). The convent encapsulates the former Goldenbridge House.

A number of other structures identified in the context of the development site were examined to assess the potential effects of the proposed development and to consider potential for mitigation where necessary. Some of the structures are already contained in the NIAH and each of these structures identified are rated in accordance with the system adopted by 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".

The definitions for each of these categories are as follows:

International

Structures or sites of sufficient architectural heritage importance to be considered in an international context. Examples include St Fin Barre's Cathedral, Cork. These are exceptional structures that can be compared to and contrasted with the finest architectural heritage in other countries.

National

Structures or sites that make a significant contribution to the architectural heritage of Ireland. These are structures and sites that are considered to be of great architectural heritage significance in an Irish context. Examples include Ardnacrusha Power Station, Co. Clare; the Ford Factory, Cork; Carroll's Factory, Dundalk; Lismore Castle, Co. Waterford; Sligo Courthouse, Sligo; and Emo Court, Co. Laois.

Regional

Structures or sites that make a significant contribution to the architectural heritage within their region or area. They also stand in comparison with similar structures or sites in other regions or areas within Ireland. Examples would include many Georgian terraces; Nenagh Courthouse, Co. Tipperary; or the Bailey Lighthouse, Howth. Increasingly, structures that need to be protected include structures or sites that make a significant contribution to the architectural heritage within their own locality. Examples of these would include modest terraces and timber shop fronts.

Local

These are structures or sites of some vintage that make a contribution to the architectural heritage but may not merit being placed in the RPS separately. Such structures may have lost much of their original fabric.

Record only



















These are structures or sites that are not deemed to have sufficient presence or inherent architectural or other importance at the time of recording to warrant a higher rating. It is acknowledged, however, that they might be considered further at a future time.

Other structures within the site development setting which are not Protected Structures or which have not been included in the NIAH have been identified as "*Structures of Architectural and Historical Interest*".

Figure 14.22 – Map indicating Structures of Cultural and Heritage significance within 100m of site



Figure 14.23 – Record of Structures of Cultural and Heritage significance within 100m of site

Record of protected Structures & Buildings Listed on the NIAH within 100m of the site									
Map Ref	RPS No	NIAH Ref No	Title	Period	Type of Structure	Distance From Site	Rating		
A	2639	50080092	Saint Michael's Church formerly - Garrison Chapel	1835 - 1935	Church	30m	Regional		
B	7817	50080099	Goldenbridge Cemetery Chapel	1829	Mortuary Chapel	50m	Regional		
C	7818	50080100	Sextons House	1829	Caretakers House	5m	Regional		
D		50080098	Goldenbridge Cemetery	1829	Cemetery	0m	Regional		
E		50080101	Goldenbridge Cemetery Walls	1829	Walls	0m	Regional		
F		50080093	Inchicore Primary Care Centre formerly - CBS School, Soldiers Recreation Room	1830 - 1870	Military	10m	Regional		
G	8705	50080094	Richmond Barracks Visitors Centre formerly - CBS School, Soldiers Gymnasium	1830 - 1870	Military	10m	Regional		
H		50080095	Richmond Barracks Visitors Centre formerly - CBS School, Soldiers Recreation Room	1830 - 1870	Military	10m	Regional		
I			Richmond Barracks Boundary Wall	1812	Military	0m	Regional		
J		50080089	McDowells Public House	1868	Public House	22m	Regional		
K		50080383	Golden Bridge	1740 - 1780	Bridge	110m	Regional		
L		50080384	Emmett Road Postbox	1920 - 1940	Post Box	80m	Regional		
M		50080088	Inchicore United Workmens Club	1880 - 1900	Clubhouse	45m	Regional		
N		50080096	Mercy Convent Gate Lodge	1860 - 1900	Gate Lodge	10m	Regional		
O		50080397	Saint Vincent's Convent	1855 - 1865	Chapel	150m	Regional		
P		50080097	Saint Anne's	1870 - 1910	Presbytery	95m	Regional		
Q			Emmett Road Terrace	c1890	Residential	15m	Architectural Interest		
R			Barracks Mortuary Chapel	c1900	Military / Religious	90m	Historical and Social Interest		

Refer to Appendix E Volume III of the EIAR for NIAH Description and Appraisal

14.4.3 Undesignated Cultural Heritage Assets

No structures of architectural heritage significance that are not included in the record of protected structures, National Inventory of Architectural Heritage or the Sites and Monuments Record have been identified that could be affected by the proposed development.

14.5 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will occupy the western half of the overall footprint of the former Richmond Barracks site, and when constructed will be bounded by St. Vincent's Street West to the west, Goldenbridge Cemetery to the south, Patriot's Path to the east and Emmet Road to the north. The remaining barracks buildings are located east of Patriots Path in the immediate vicinity of the development but do not form part of the development site. The lands further to the east, behind the barracks buildings has been developed under various housing and community uses in the recent past. The development will largely consist of residential buildings of three to seven storeys separated by external circulation and amenity spaces with a number of community and commercial units to the northern end of the site onto Emmet Road. The existing community centre located on Patriots Path to the west of the HSE Primary Care Centre (formally one the barracks buildings) will be retained and be embedded into the new development. A new crèche building will also be provided in the development to the west of the former barracks' gymnasium building. The development will occupy the existing green open spaces between St. Vincent's Street West and Patriots Path.

The existing structures and sites of historical merit will be largely all retained in the proximity of the development. Historical sites and structures in the immediate vicinity of the development include the remaining three former Richmond Barracks buildings to the east, Goldenbridge Cemetery to the south, St. Michael's Church to the North East and the section of boundary wall at the edge of the site at the North West corner. The scale and massing of the development will be higher than any of the surrounding buildings of historical or modern origins. The only modifications to physical fabric will be the loss of below ground remnants of the barracks buildings, and modifications to the boundary wall to the North West corner where sections of masonry will be removed to form openings allowing permeability in this area of the development.

The positions of the new buildings within the site have been organised in a way that retains the sightlines along existing routes towards the historically significant sites and structures around the edges of the site. Diagonal sightlines across the site will be obscured by the new buildings.

A detailed description of the proposed development is contained in the BMCEA Architects Design Statement and Chapter 2 of the EIAR.

The proposal will entail the removal of some sections of remaining protected wall associated with Richmond Barracks. The wall is on the Dublin City Council Record of Protected Structures (Ref. No. 8705, Description:– 'Former St. Michael's CBS building and stone flanking pavilion buildings, formerly known as Richmond/Keogh Barracks, including rubble stone boundary walls'). There is a significant quantity of wall remaining at this location and albeit altered in some locations retains its original design intent as a defensive boundary wall. The wall also changes direction at this location from North-South to East West direction forming the north west corner of the former barracks site. It also contains a War Department marker stone indicating the boundary of land once owned by the British War Department.

Sections of masonry will be removed to ground level at three locations at the North West corner to form openings allowing pedestrian access to pass through from the public footpath into the development site. A section of the southern end of the wall along St. Vincent's Street West will also be removed due to the proximity of the adjacent new building immediately inside the wall. Sections of the wall along Emmet Road are also been lowered in order to provide a better relationship between the public footpath along Emmet Road and the development.

The proposed development also includes the construction of a watermain for c. 200m along the Emmet Road to the junction of Grattan Crescent and Tyrconnell Road, which will traverse Golden Bridge.

It is noted a permitted Part 8 (PRR 2221/21) allows for the demolition of existing modern structures in the northern part of the site.

14.6 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

14.6.1 Construction Phase

The redevelopment of the majority of the former Richmond Barracks site to provide a mixed-use development (predominantly housing).

The potential exists for vibration damage, arising from construction and demolition works associated with the demolition of the existing buildings on the site and/or associated with the watermain works along Emmet Road, may impact on surrounding Protected Structures and structures of historical merit in the vicinity of the proposed development such as Richmond Barracks, (including the stone wall), St. Michael's Church, Goldenbridge Cemetery. This is considered to be a short-term, slight negative impact in the absence of mitigation.

The proposal includes the removal/demolition of sections of north-west wall (protected structure no. 8705) to form new openings. The works also entail the lowering of northern section of boundary wall. The removal of the sections of wall is considered to be a direct negative, moderate, and permanent impact.

It is noted a permitted Part 8 (PRR 2221/21) allows for the demolition of existing modern structures in the northern part of the site which will facilitate the proposed development. The removal of these structures and their replacement with a new high-quality scheme including a plaza is positive and long term.

14.6.2 Operational Phase

There will be no direct effects on architectural heritage during the operational phase as a direct effects indicates alterations to the structures and there will be no alterations to structures outside the site boundary.

There will be indirect effects on some structures of architectural heritage significance during the operational phase relating to the setting and regenerated site.

In relation to remaining Richmond Barracks buildings:

The proposed development includes a range of heights of between 3 and 7 storeys. The height of proposed buildings to the west of the three remaining barracks buildings is higher than existing, altering the historic context of the remaining Richmond barracks buildings. The setting of these buildings historically were addressed by a 3 Storey range of soldier’s quarters and also social housing of up to 8 storeys (as part of the St. Michael’s Estate). As such the project site and its relationship with Richmond Barracks has altered a number of times since its construction. The proposed insertion of a high-quality mixed-use development has the potential to alter the current relationship, and the impact is considered to be permanent, neutral and not significant.



Figure 14.24 – Artists Impression of space between former Barracks Buildings and adjacent 7-storey building

In relation to St. Michaels Church:

The closest building within the proposed development to St. Michael’s Church is the proposed new Community Hub/Library building which has been set back a distance from the southern building line of the church. A proposed plaza is designed to be located to the north of the Community Hub/Library and to the west of St. Michael’s Church. The impact is considered to be permanent, neutral and not significant.

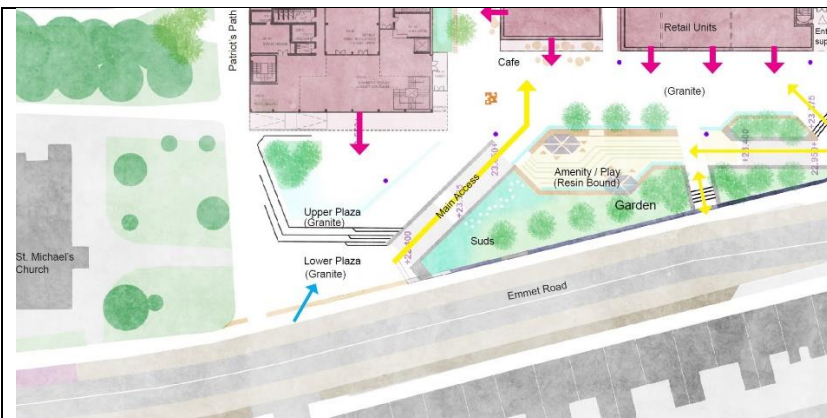


Figure 14.25 – Artists Impression of setback of development and St. Michael’s Church

With reference to the boundary wall:

The impact of the modifications to the boundary wall is considered to be permanent, negative and significant. The North West corner of the wall is currently legible as a defensive boundary wall and retains much of its original design intent. The exact height of the original wall is unclear; the higher section to St Vincent’s Street West has undergone some modifications along the top. The loss of fabric to form the openings and the further adjustments to the height of the wall dilute its historic function as a boundary wall to the former Barracks site. The purpose of the original wall was to defend against ingress into the barracks complex. The site is currently to undergo development for a new use. The fabric of the wall given its association with the barracks is still significant; however, it no longer serves as it was originally intended. There will be loss of masonry resulting from the creation of the new openings and modifications to the tops of the existing levels.



Figure 14.26 – Artists Impression of Proposed Works to Wall along St. Vincent’s Street

Goldenbridge Cemetery.

The proposed development is set back from the cemetery wall by approximately 18m. The space between the cemetery wall and the complex will be occupied by a shared surface carriageway, carpark spaces and a green area along the base of the cemetery wall. The closest buildings to the wall will consist of 5 and 7 storeys. The development has been set back from St. Vincent’s Street West on the western side in order to allow more space to the gatekeepers lodge at the entrance to the cemetery. This setback also allows increased sightlines at a greater distance from the cemetery on approach from the north along St. Vincent’s Street West. The impact of the proposed development on the cemetery is considered to be permanent, neutral and not significant.



Figure 14.27 – Artists Impression of development next to Goldenbridge Cemetery

Figure 14.28 – Summary of Impacts on Record of Protected Structures and Buildings Listed on the NIAH

Summary of Impacts on Record of Protected Structures & Buildings Listed on the NIAH within 100m of the site								
Map Ref	RPS No	NIAH Ref No	Title	Period	Type of Structure	Distance From Site	Impact	
A	2639	50080092	Saint Michael's Church	1835 - 1935	Church	30m	Permanent, Neutral, Not Significant	
B	7817	50080099	Goldenbridge Cemetery Chapel	1825 - 1835	Mortuary Chapel	50m	Permanent, Neutral, Not Significant	
C	7818	50080100	Sextons House	1860 - 1900	Caretakers House	5m	Permanent, Neutral, Not Significant	
D		50080098	Goldenbridge Cemetery	1825 - 1830	Cemetery	0m	Permanent, Neutral, Not Significant	
E		50080101	Goldenbridge Cemetery Walls	1825 - 1830	Walls	0m	Permanent, Neutral, Not Significant	
F	8705	50080093	Inchicore Primary Care Centre	1830 - 1870	Barracks	10m	Permanent, Neutral, Not Significant	
G		50080094	Richmond Barracks	1830 - 1870	Barracks	10m	Permanent, Neutral, Not Significant	
H		50080095	Richmond Barracks	1830 - 1870	Barracks	10m	Permanent, Neutral, Not Significant	
I			Richmond Barracks Boundary Wall	1812	Defensive	0m	Permanent, Negative, Significant	
J		50080089	Mcdowells Public House	1865-1870	Public House	22m	Permanent, Neutral, Not Significant	
K		50080383	Golden Bridge	1740 - 1780	Bridge	110m	Permanent, Neutral, Not Significant	
L		50080384	Emmett Road Postbox	1920 - 1940	Post Box	80m	Permanent, Neutral, Not Significant	
M		50080088	Inchicore United Workmans Club	1880 - 1900	Clubhouse	45m	Permanent, Neutral, Not Significant	
N		50080096	Mercy Convent Gate Lodge	1860 - 1900	Gate Lodge	10m	Permanent, Neutral, Not Significant	
O		50080397	Saint Vincent's Convent	1855 - 1865	Chapel	150m	Permanent, Neutral, Not Significant	
P		50080097	Saint Anne's	1870 - 1910	Presbytery	95m	Permanent, Neutral, Not Significant	
Q			St. Vincent Street West Cottages	C1890	Residential	10m	Permanent, Neutral, Not Significant	
R			Emmett Road Terrace	C1890	Residential	15m	Permanent, Neutral, Not Significant	

The likely impacts of the proposed development at operational phase relate to the visual impact of the proposed works on the architectural character of the wider area. This has been taken into consideration as part of the incorporated mitigation by design.

14.6.3 “Do-Nothing” Scenario

If the proposed development were not to proceed, there would be no negative impact on the archaeological, architectural or cultural heritage resource. The exposed nature of the masonry in the boundary wall means that maintenance will be required on an ongoing basis. The views diagonally across the existing green space to Goldenbridge Cemetery would be retained. The northern end of the site would continue to retain abandoned buildings currently detracting from the site.

14.6.4 Cumulative Impacts

While a number of planning permissions have been granted in the area and not yet implemented, none of these would lie between the application site and the structures of architectural heritage significance that have been identified in this chapter as being in the vicinity of the application site. None of the extant, but not implemented, planning permissions would add a cumulative effect (such as the 52 unit older persons residential development located to the east of the project site) to that of the proposed development.

14.7 MITIGATION MEASURES

14.7.1 Construction Phase

It is recommended that protection is put in place around the remaining section of boundary wall in order to limit any impact damage to the wall during construction works (including demolition works).

In relation to the works to remove sections of the boundary wall a method statement which contains appropriate mitigation measures such as propping during the construction work and repointing of the whole wall on completion of the works has been prepared and is included in Appendix C of Volume III of the EIAR. The method statement forms part of the mitigation for the project.

The remaining section of the wall is to undergo conservation works including repointing, stone replacement and works to the wall top. Where sections of wall are to be removed, the stone will be reused elsewhere on the wall in areas where repairs will be carried out.

Vibration limitation are to be calculated and mitigation measure to lessen damage by vibration are to be put in place. To mitigate the potential direct effect on the boundary wall the means of excavation of the land within the site in the vicinity of the wall and other adjacent protected structures should be designed so as to minimise any vibration that would be likely to cause damage to the building. Chapter 8, Noise and Vibration, has predicted that the vibration levels during construction (including demolishing works of structures in northern part of site) are not likely to be such that any damage would occur to built heritage structures, notwithstanding the adoption of lower limits of vibration for the protected structures. The Noise and Vibration chapter has proposed mitigation through monitoring in accordance with the relevant standards to ensure that vibration levels do not exceed acceptable levels in the vicinity of built heritage structures.

14.7.2 Operational Phase

The new openings to be introduced along the original boundary wall as part of the proposed development will be carried out in conjunction with conservation works to the existing masonry to ensure the survival of historic fabric. The retention of much of the historic wall, together with the introduction of active use in the vicinity of the wall, will reduce the defensive character to the wall while respecting it as a boundary element to the former barracks site. The War Department Boundary marker stone currently located in the wall will be moved to a new location along the wall. Corten steel will be added to the top of the wall as in indicator to wall's original height.

The juxtaposition of new elements, whether buildings or planting can also be seen to highlight the particular and contrasting nature of the remaining section of wall. Monitoring works are to be carried out to ensure no damage to existing historic fabric occurs.

The development has been designed in a way that mitigates the overall impact of the proposed building on the existing historic structures. The inclusion of setbacks allow for greater sightlines towards historic structures. Public open spaces and green areas close to historic buildings act as a buffer zone and soften the visual impact of the development.

Interpretive signage will be introduced to inform the general public of the site’s past. The portion of the boundary wall along St. Vincent’s Street West is to be referenced in the proposed development.

14.8 RESIDUAL IMPACTS

Proposed Alteration	Negative Impacts	Observations	Positive Impacts	Mitigating measures
OVERALL PROPOSAL				
<p>Redevelopment of the proposed development site including removal of all the buildings to the northern end of the site, and modifications to the remaining portion of the boundary wall at the junction of St. Vincent’s Street west and Emmet Road. Watermain upgrade works.</p>	<p>Loss of views to Goldenbridge Cemetery from Patriot’s Path and St. Vincent’s Street West.</p> <p>Loss of legibility of historic boundary wall to at the junction of St. Vincent’s Street west and Emmet Road.</p> <p>Water main upgrade works are not expected to have a negative impact.</p>	<p>Current buildings to be removed, are relatively modern and of negligible architectural heritage significance.</p> <p>In setting up the geometry of the new development, the historic setting has been greatly considered.</p> <p>Open spaces have been incorporated next to the significant historic structures around the perimeter of the site.</p> <p>The use of the site for largely residential purposes, is a continuation of its historical use throughout much of the 20th century and is inherent to the nature of the place.</p> <p>The proposed development site has undergone various residential development phases since its use as a Military Barracks.</p>	<p>Nature of the redevelopment permits the pedestrian penetration of the site when completed.</p> <p>The proposed development gives the site a new repurposed use and will provide much needed residential accommodation and amenity spaces for the local community.</p> <p>The geometry of the proposed layout is sympathetic to site’s past use as a Barracks as well as the surviving barracks structures.</p>	<p>The development has been designed to incorporate interpretive information to inform the general public of the site’s past.</p> <p>The sections of the boundary wall along the St. Vincent’s Street that are to be removed to allow permeability will be used further south to reconstruct sections of the wall that have already been lost.</p> <p>Lansdcaped areas have been designed at the approach to all the remaining historically significant structures.</p>

14.8.1 Construction and Operational Phase

The main residual effect on the architectural heritage is the change of use of the large open site, much of which is occupied by the large green open space that once contained the former Richmond Barracks parade ground, the Keogh Square and later St. Michael's Estate housing scheme. The views southwards towards Goldenbridge Cemetery along St. Vincent's Street West and Patriots Path will be permanently obscured by the new development.

The remaining section of the Boundary Wall be will permanently altered.

Loss of fabric has to be balanced with overall amenity of the wall presentation – ability of the existing masonry, when modified, to contribute at ground and at roof level to overall positive visual and social amenity of the scheme.

Removal of connections to defensive barracks wall allows for more generous connections and visual spatial improvements at junctions. Existing historic buildings will remain a backdrop to new building to the west. Large green space to west of historic buildings will provide breathing space across Patriot's Path.

14.9 MONITORING

14.9.1 Construction and Operational Phase

The mitigation measures recommended above would also function as a monitoring system during construction to allow the further assessment of the scale of the predicted impacts and the effectiveness of the recommended mitigation measures. A Conservation architect will be part of each design team during the preparation of construction documents, tender process and during the construction of the proposed developments.

Monitoring will be carried out by a Conservation Architect to ensure no damage to existing historic fabric occurs during the construction phase.

During the construction phase it will be necessary to monitor vibration levels, to ensure that no damage occurs to Richmond Barracks including the boundary wall, through vibration effects. Chapter 8, Noise and Vibration, sets down the criteria for monitoring during construction.

Annual inspections and cleaning (where necessary) is proposed in respect of the wall during the operational phase in order to maintain its appearance and integrity.

14.10 REINSTATEMENT

14.10.1 Construction and Operational Phase

Not applicable.

14.11 INTERACTIONS

Please refer to Chapter 16 for interactions.

14.12 DIFFICULTIES ENCOUNTERED IN COMPILING

No difficulties were encountered in compiling information.

14.13 REFERENCES

- Bennett, I. (ed.) 1987–2010. *Excavations: Summary Accounts of Archaeological Excavations in Ireland*. Bray. Wordwell.
- British Military Archives, Kew Gardens (Blackwood Associates Architects)
- Byrne, F. J 1973 *Irish Kings and High Kings*. London: Batsford.
- Chartered Institute for Archaeologists 2014a. *Standards & Guidance for Field Evaluation*.
- Chartered Institute for Archaeologists 2014b. *Standards & Guidance for Archaeological Excavation*.
- Chartered Institute for Archaeologists 2014c. *Standards & Guidance for an Archaeological Watching Brief (Monitoring)*.
- Clarke, H B (ed). 1990. *Medieval Dublin: The Living City*. Blackrock Co Dublin: Irish Academic Press.
- Clarke, H. 2002. *Historic Towns Atlas of Dublin. Part 1*
- De Courcy, J W. 1996. *The Liffey in Dublin*. Dublin: Gill and Macmillan.
- Department of Arts, Heritage, Gaeltacht and the Islands. 1999a. *Framework and Principles for the Protection of the Archaeological Heritage*. Government Publications Office, Dublin.
- Department of Arts, Heritage, Gaeltacht and the Islands. 1999b. *Policy and Guidelines on Archaeological Excavation*. Government Publications Office, Dublin.
- Dowd, M. and Carden, R. 2016 *First evidence of a Late Upper Palaeolithic human presence in Ireland*. *Quaternary Science Reviews* 139, 158–63.
- Environmental Protection Agency. 2015. *Draft Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)*. Government Publications Office, Dublin.
- Environmental Protection Agency. 2017. *Draft Guidelines on the Information to be Contained in Environmental Impact Statements*. Government Publications Office, Dublin.
- MacCotter, P. 2008. *Medieval Ireland: Territorial, Political and Economic Divisions*. Four Courts Press, Dublin.
- McQuade, M. and O'Donnell, L. 2007 'Late Mesolithic fish traps from the Liffey estuary, Dublin, Ireland,' *Antiquity* 81:313, pp. 569-584.
- Mitchell, G. F. 1972 'Further Excavation of the Early Kitchen-Midden at Sutton, Co. Dublin,' *The Journal of the Royal Society of Antiquaries of Ireland*, 102:2, pp. 151-159.
- National Monuments Service, Department of Housing, Local Government and Heritage. *Sites and Monuments Record, County Dublin*.
- National Museum of Ireland. *Topographical Files, County Dublin*.
- O'Brien, E. 1998 *The Location and Context of Viking Burials at Kilmainham and Islandbridge, Dublin*. In H.B. Clarke, M. Ni Mhaonaigh and R. O'Floinn (ed.) *Ireland and Scandinavia in the Early Viking Age*, Four Courts Press. Dublin, 203-221.
- O'Meara L. 2014 *From Richmond Barracks to Keogh Square*
- O'Meara L. 2016 *Who Remembers Keogh Square?*
- Stout, G. and Stout, M. 1997 'Early Landscapes: from Prehistory to Plantation' in Aalen, F.H.A et al (eds) 1997 *Atlas of the Irish Rural Landscape* Cork University Press

Stout, M. 2017 Early Medieval Ireland 431-1169. Bray. Wordwell.

Wilde, W. 1866 On the Scandinavian antiquities lately discovered at Islandbridge, near Dublin. Proceedings of the Royal Irish Academy 10, 13–22

CARTOGRAPHIC SOURCES

William Petty, Down Survey Map of the Parish of Kilmainham, c.1655

John Rocque, A Survey of the City, Harbour, Bay, and Environs of Dublin, 1757

(Check to see if the maps on this list are included)

Pool Map (A Plan of Dublin), 1780

The Society of the Diffusion of Useful Knowledge, 1812

John Taylor, Map of the Environs of Dublin, 1816

Warburton Whitelaw Walsh, 1818

Duncan. Map of the County of Dublin, 1821

J Cooke, Cooke's Royal Map Of Dublin, 1822

WB Clarke, 1836

OS Map 1838

Pettigrew and Oulston, 1840

OS Map 1872

OS Map 1903

Ordnance Survey Maps of Dublin, 1843-1947

ELECTRONIC SOURCES

www.excavations.ie – Summary of archaeological excavation from 1970-2020.

www.archaeology.ie – Department of Housing, Local Government and Heritage website listing all SMR/RMP sites.

www.heritagemaps.ie – The Heritage Council web-based spatial data viewer which focuses on the built, cultural and natural heritage.

www.googleearth.com – Satellite imagery of the proposed development area.

www.bingmaps.com – Satellite imagery of the proposed development area.

www.richmondbarracks.ie – A Dublin City Council - Community Partnership to Restore and Commemorate the Heritage of Richmond Barracks

15.0 RISK MANAGEMENT FOR MAJOR ACCIDENTS AND/OR DISASTERS

15.1 INTRODUCTION

The 2014 EIA Directive (2014/52/EU) has updated the list of topics to be addressed in an EIAR and has included 'Risk Management' as a new chapter to be addressed. Article 3 of the new EIA Directive requires that the EIA shall identify, describe and assess in the appropriate manner, the direct and indirect significant effects on population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage, and landscape deriving from (amongst other things) the *“vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned”*.

The purpose of the chapter is to ensure that the safety and precautionary measures necessary to protect the proposed development in the event of a major accident and / or natural disaster are identified and that appropriate mitigation measures are provided that would protect the environment in the event of such occurrences.

This chapter will identify the types of major accidents / natural disasters that the project is vulnerable to; whether major accidents or natural disasters and the responses to these give rise to significant adverse environmental impacts; the nature of these impacts and the measures needed to prevent or mitigate the likely adverse impact of such events on the environment.

15.2 STUDY METHODOLOGY

The starting point for the scope and methodology of this assessment is that the proposed development has been designed and will be constructed in line with best practice described in the OCSC Construction Environmental Management Plan (See Volume III of the EIAR) and, as such, major accidents and / or natural disasters will be very unlikely. The identification, control, and management of risk is an integral part of the design and assessment process throughout all stages of a project lifecycle. For example, a Specific Site Flood Risk Assessment was carried out. Measures to control risks associated with Construction Phase activities are incorporated into the Construction Environmental Management Plan. A number of design safety reviews and risk analysis have also been completed in line with the provisions of the Safety Health at Work (Construction) Safety Regulations 2013 and supporting legislative requirements. The purpose of this review was to identify and highlight key safety issues for further review during detailed design and construction. Issues identified have been incorporated into a design risk register and collectively reviewed by the design team as well as noted within individual design risk assessment information (as issued by each designer).

The following sections set out the requirements as stated in the new EIA Directive, Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment' (August 2018) and in the EPA Guidelines on the information to be contained in an Environmental Impact Assessment Report (EIAR (May 2022)). The scope and methodology presented is based on the new EIA Directive, the EPA guidelines and professional judgement of the consultants with this responsibility in the construction and operation of the proposed development. A risk analysis-based approach methodology which covers the identification, likelihood and consequence of major accidents and / or natural disasters has been used for the assessment. This type of risk assessment approach is an accepted methodology.

Recital 15 of the EIA Directive states that:

“In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment. For such projects, it is important to consider their vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment. In order to avoid duplications, it should be possible to use any relevant information available and obtained through risk assessments carried out pursuant to Union legislation, such as Directive 2012/18/EU.”

The proposed development in this instance is residential development on a predominantly greenfield site which includes a construction access road traversing the site and a construction compound. When the proposed development is completed, it will not give rise to ongoing significant risks in its operating environment.

The 2022 EPA Guidelines on the information to be contained in an EIAR refer to major accidents and/or disasters in a number of sections, as follows:

Characteristics of the Project – the guidelines state that the project characteristics should include “a description of the Risk of Accidents – having regard to substances or technologies used.”

Impact assessment - the guidelines state that the impact assessment should include “the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)”.

Likelihood of Impacts - the guidelines state the following:

“To address unforeseen or unplanned effects the Directive further requires that the EIA takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned and that the EIA therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIA should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other regulations e.g. a COMAH assessment.”

There are also a number of mechanisms which currently manage accidents outside of the EIA process. These would include the Construction Environmental Management Plan, which would deal with pollution risks during construction (See Chapters 5, 6 and 7 on Land, Soils, Air and Water) and risk of accidents during construction, including traffic accidents. The risk of flooding is dealt with in Chapter 6; Water. The development within the subject site is in Flood Zone C which is low risk and is appropriate for residential development. Separately, the risk of fire is managed through the Fire Safety Certification process, which is an integral part of the design of the proposed development.

15.2.1 Site Specific Risk Assessment Methodology

This section identifies the potential of unplanned but potential events that could occur during construction and operation of the proposed development.

Risks are set out according to the classification of risk, taken from the Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage & Local Government, 2010), as follows:

Table 15.1 – Risk Classification

Ranking	Classification	Likelihood
1	Extremely Unlikely	May occur only in exceptional circumstances; Once every 500 or more years
2	Very Unlikely	Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities or communities; and / or little opportunity, reason or means to occur; May occur once every 100-500 years.
3	Unlikely	May occur at some time; and /or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisations worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years.
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years
5	Very Likely	Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year.

15.2.2 Hazard identification

The site is not in an area prone to natural disasters. Risks were reviewed through the identification of plausible risks in consultation with relevant specialists. Therefore, the risks set out below are considered the most relevant potential risks.

Table 15.2 – Risk Likelihood

Category	Risk Factor Type	Likelihood
Weather	Storms, snow	3
Hydrological	Risk from flooding	1
Excavation work	Collapse	3
Road	Traffic accident	4
Industrial accident	General housebuilding construction	1
Explosion	General Construction materials no explosive products used.	1
Fire	Hot works close to timber frame structures, if required.	3
Building Collapse	Structural failure during construction.	1
Hazardous substance escape	General housebuilding construction products.	2
Pollution	Construction	3

The risks are then tested in terms of consequences (the most probable result of the potential incident). It should be noted that when categorising the Consequence Rating, the rating assigned assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster.

The impact ratings are taken from the Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage & Local Government, 2010).

A risk matrix can be prepared against which the proposed development can be tested.

Table 15.3 – Risk Matrix

Likelihood Rating	Very likely	5					
	Likely	4					
	Unlikely	3					
	Very unlikely	2					
	Extremely Unlikely	1					
				Minor	Limited	Serious	Very Serious
			1	2	3	4	5
Consequence Rating							

15.3 RECEIVING ENVIRONMENT

The overall site amounts to 4.68 hectares, a portion of which comprises the lands of the (now demolished) Saint Michael’s Estate housing development and the watermain upgrade works along Emmet Road. The main development site (3.72 hectares) lands are bounded to the north by Emmet Road, to the south by Goldenbridge cemetery to the east by the former Richmond Barracks and the pedestrian link to the Bulfin estate next to Saint Michael’s Church and to the west by Saint Vincent Street West.

The Site is located in the heart of Inchicore village within a well-established setting. The site is approximately 350m long with width varying from 105-115m in an east west direction. The overall site covers approximately 3.8 hectares in total across a mixture of existing buildings, existing hard landscaped areas and existing greenfield/brownfield space.

The site is gently sloping in a broadly south-west to north east direction. The highest point of the site is located in the south western corner of the site adjacent to the gatehouse of Goldenbridge Cemetery at 27.5m OD. The ground level falls by approximately 1m along the length of the boundary wall to Goldenbridge Cemetery to 26.5m OD at the south eastern corner of the site. Levels fall to approximately 24m OD adjacent to the Community Sports Centre across a length of c. 240m-this equates to an average fall of approximately 1 in 70 across the main open space of the site.

The site of the proposed development has a long history of previous uses. It originally formed part of the Richmond Barracks-a British Army Barracks first occupied in 1814. Following the formation of the Irish Free state, the barracks

changed into Irish hands in 1922 and remained in use as a barracks until its closure in 1925. Subsequently the site was handed over to Dublin Corporation with the development of Keogh Square purpose-built residential accommodation in 1947. A large-scale social housing development known as St Michaels Estate was completed in the 1970s consisting of a number of tower blocks. The buildings were in use up until the early 2000s with demolition of the various blocks being undertaken between 2004 and 2013.

The surrounding context consists of a mix of residential cultural, cemetery and commercial lands. It does not include any man-made industrial processes (including SEVESO II Directive sites (96/82/EC & 2003/105/EC) which might result in a risk to human health and safety. From a review of the Dublin City County Council Development Plan Map E there are no SEVESO Site as defined by the Health and Safety Authority, on the subject site of the proposed development, in the immediate vicinity, or in the surrounding Inchicore Village.

15.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development comprises the construction of a mixed-use residential development consisting of 578 no. apartments, a creche, Community Hub/Library, 5 no. retail/retail services units, a neighbourhood supermarket, as well as open space, and infrastructural works/services to serve the development. It also includes water main upgrades along Emmet Road (for c. 200m) to the junction of Tyrconnell Road and Grattan Crescent.

The project also includes the demolition of the existing buildings on the subject site (as part of a permitted Part 8 development Reg. Ref. 2221/21). A description of the project is provided in Chapter 2 of the EIAR.

15.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

15.5.1 Health & Safety/ Risks of Major Accidents and/or Disasters

It is noted that the risks associated with the proposed work falls short of reaching the criteria to classify the project as reaching even the 'lower tier establishment' as outlined within the SEVESO II Directive sites (96/82/EC & 2003/105/EC), therefore the risks likely to be encountered on the project are associated with demolition or construction. Examples of which would be:

Risk of falling from scaffolding, ladders or unprotected edges/open voids during the construction phase.

- Risk of falling into open excavations.
- Risk of burial under earthfalls in basement excavations.
- Risk of injury from falling tools / construction materials during construction phase.
- Risk of electrocution / flooding during the foundation works. Any work around existing services.
- Risk of injury during the assembly of precast columns, stairs, façade panels, etc.

15.5.1.1 Construction Phase

It is considered that the main risks associated with the proposed development will arise during the construction phase. The design and specification of materials has been reviewed with regard to their likely use based on experience from previous construction projects during the initial design phase so as to minimise potential impact during construction. Where required technical data information will be procured and assessed with reference in the developed Preliminary Safety Plan for the project (Hazardous materials are a recognised 'Particular Risk' under safety legislation and as such is addressed in detail in design risk assessment information). A site layout drawing will be prepared by the lead designer indicating site access routes, indicative site compound, existing services and locations of material storage.

In the event of storms or snow, construction activity can be suspended and the site secured. The construction activity will involve a number of potential risks as set out in the construction management plan. The risks identified include, flood risk, movement of site vehicles and co-ordination with other projects and contractors with regard to traffic management, design and construction of temporary support works to ensure the stability of partially erected structures, working at height, construction impacts on the local road network and fire strategy. In addition, a fire safety management plan and risk assessment will be prepared by the main contractor and reviewed by the PSDP as part of the overall construction safety plan. This will reduce hot works on site and management remaining fire safety issues through a formal permit to work system. The safety plan will also highlight emergency preparedness and planning throughout the construction phase.

The construction phase of the proposed development may give rise to short-term impacts associated with construction traffic, migration of surface contaminants, dust, noise and littering. Secondary impacts may include resulting increased traffic arising from hauling building materials to and from the proposed development site which are likely to affect population and human health distant from the proposed development site, including adjacent to aggregate sources and landfill sites.

Construction impacts are likely to be short term and are dealt with separately in the relevant chapters of this EIAR document and will be subject to control through a Construction Environmental Management Plan. The construction methods employed, and the hours of construction proposed will be designed to minimise potential impacts. The development will comply with all Health & Safety Regulations during the construction of the project. Where possible, potential risks will be omitted from the design so that the impact on the construction phase will be reduced.

15.5.2 Operational Phase

The main risk identified during operation is the risk of fire. It should be noted that the proposed uses are considered normal hazard fire risks as would be encountered in most residential developments and do not include any hazards which would be regarded as presenting an exceptional environmental fire hazard.

A schedule of Residual Risks will be prepared by designers appointed to the project and reviewed by Linesight as PSDP. This will set out risk associated with the management and maintenance of the completed buildings and how these can be safely mitigated with reference to the Safety File (operations and maintenance information) for the project.

The fire risk mitigation for the project will comprise all fire safety measures necessary to comply with the requirements of Building Regulations. It is noted that these measures will be validated under the Building Control Act 1990-2007 through the obtaining, in due course, of statutory Fire Safety Certificates under Part III of the Building Control Regulations 1997-2018 from South Dublin County Council.

The measures will include inter alia:

- Provision of fire-rated materials in accordance with relevant building regulations.
- Provision of early warning fire detection systems where required under building regulations;
- Use of materials which do not support fire spread with particular reference, inter alia, to internal wall and ceiling linings and external wall cladding.
- Facilities to assist the fire service including fire tender access proximate to all units, dry rising mains, and external fire hydrants
- A bespoke Fire Emergency Evacuation Plan [FEPP] will be prepared by a fire consultant at detailed design stage.

15.5.3 'Do Nothing' Scenario

In the do-nothing scenario, the potential risk of the site causing, or being affected by a disaster and / or accident would be low, given that the site is currently an undeveloped greenfield site.

15.6 MITIGATION MEASURES

The Construction Management Plan and the Health and Safety Plan (which will use the mitigation in the EIAR) will limit the risk of accidents during construction. Fire safety will be dealt with under the Fire Safety Code at design and construction stage. The estate management company will have responsibility for fire safety during operations.

The proposed development will involve ground works to facilitate the proposed development. Site investigations have been carried out (refer to Appendix D1. Volume III of this EIAR) and have not identified any hazardous material with the exception of TP54 at 1.00mBGL where the results indicate that the total organic carbon is above the inert limits (3.86% vs 3%). Note TP 54 is within the subject site to the north west of the site. All spoil disposed of off-site will be sent to a suitably licensed facility. Further site investigation and WAC (Waste Acceptance Criteria) testing will be carried out prior to construction to inform the detailed design. In the event that any hazardous material is identified the appropriate measures will be taken in accordance with the requirements of the EPA. The excavation and movement of soil from the site will be undertaken by a registered specialist contractor and removed to a licensed facility. The following are outlined:

- Hazardous materials used during construction will be appropriately stored so as not to give rise to a risk of pollution.
- In the event of storms or snow, construction activity can be halted and the site secured. The construction activity will involve a number of potential risks, as set out below. The risks identified include traffic management, and fire strategy.
- During the construction stage, the risk of accidents associated with the proposed development are not predicted to cause unusual, significant or adverse effects to the existing public road network. The vast majority of the works are away from the public road in a controlled environment. The objective of which is to minimise the short term disruption to local residents, and reduce the potential for accidents.
- Furthermore, is expected that the risk of accidents would be low during the construction of the proposed development considering the standard construction practices which are to be used.
- With reference to natural disasters (e.g. flooding), the proposed development has undergone a Site Specific Flood Risk Assessment, prepared by DBFL Consulting Engineers. The main area of the site where development is proposed is low risk of fluvial, pluvial or groundwater flooding.
- A Health and Safety Plan will be prepared (required by the *Safety, Health and Welfare at Work (Construction) Regulations 2013*) to address health and safety issues from the design stages through to the completion of the construction and maintenance phases. The Health and Safety Plan will comply with the requirements of the Regulations and will be reviewed as the development progresses.
- Safety on site will be of paramount importance. Only contractors with the highest safety standards and training will be selected. During the selection of the relevant contractor and the respective subcontractors their safety records will be investigated.
- Prior to working on site, each individual will receive a full safety briefing and will be provided with all of the safety equipment relevant to the tasks the individual will be required to perform during employment on site.
- Safety briefings will be held regularly and prior to any onerous or special task. ‘Toolbox talks’ will be held to ensure all workers are fully aware of the tasks to be undertaken and the parameters required to ensure the task will be successfully and safely completed.
- All visitors will be required to wear appropriate personal protective equipment prior to going on to the site and will undergo a safety briefing by a member of the site safety team.
- Regular site safety audits will be carried out throughout the construction programme to ensure that the rules and regulations established for the site are complied with at all times.

The design and specification of materials has been reviewed with regard to their likely use based on experience from previous construction projects during the initial design phase so as to minimise potential impact during construction. Where required technical data information will be procured and assessed with reference in the developed Preliminary Safety Plan for the project (Hazardous materials are a recognised ‘Particular Risk’ under safety legislation and as such is addressed in detail in design risk assessment information). A site layout drawing will be prepared by the lead designer indicating site access routes, indicative site compound, existing services and locations of material storage.

In the event of storms or snow, construction activity can be suspended and the site secured. The construction activity will involve a number of potential risks as set out in the construction management plan. The risks identified include, flood risk, movement of site vehicles and co-ordination with other projects and contractors with regard to traffic management, design and construction of temporary support works to ensure the stability of partially erected structures, working at height, construction impacts on the local road network and fire strategy. In addition, a fire safety management plan and risk assessment will be prepared by the main contractor and reviewed by the PSDP as part of the overall construction safety plan. This will reduce hot works on site and management remaining fire safety issues through a formal permit to work system. The safety plan will also highlight emergency preparedness and planning throughout the construction phase.

Table 15.4 – Strategy for tackling potential risks

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION
Risk Number	Risk Description / Risk Event Statement	Responsible	Impact H / M / L	Probability H / M / L	Actions
Provide a unique identifier for risk	A risk event statement states (i) what might happen in the future and (ii) its possible impact on the project.	Name or title of team member responsible for risk	Enter H (High); M (Medium) ; or L (Low) according to impact definitions	Enter H (High), M (Medium) or L (Low) according to probability definitions	List, by date, all actions taken to respond to the risk. This does not include assessing the risk
1	Work which puts persons at risk of:-burial under earth falls. Risk of burial under earthfalls in trenches.	Project Supervisor Construction Stage (PSCS)	H	M	Contractor to address requirement for trench support. Excavations are to be carried out at safe slope. Refer to site investigation for same and temporary works engineer to design.
2	Scaffolding Risk of falling from scaffolding, ladders or unprotected edges/open voids during the construction phase.	PSCS	H	M	Working at height required throughout the project. Installation of scaffolding for all working at height activities to be subject to a full temporary works design submission. In order to fully Co-Ordinate any temporary works submission the Project Supervisor for the Design Process must receive the following items before reviewing any submission; A full design submission, Calculations for the design, Design Risk Assessment, Copy of designer's PI insurances, Designers CV. This submission can then be reviewed by the Permanent Works Engineer to ensure the design will not impact on the permanent structure.

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION
3	<p>Fire Strategy</p> <p>Risk of fire damage to houses or to partially complete new apartment blocks from construction activities.</p>	PSCS/ PSDP / Fire SC.	H	M	<p>Fire strategy must be put in place in advance of start on site which must take into consideration the requirement for hot works and the provision of Hot Works Permit systems to manage Hot works when needed. A fire marshal will be required - full co-operation from site supervisors and contractors will be required. Specification of materials will be reviewed during design and in submittals from the contractor with the objective of ensuring compliance with current standards and minimising fire load</p>
4	<p>Lifting Operations</p> <p>Work involving the assembly or dismantling of heavy pre-fabricated components.</p> <p>Risk of injury during the assembly of precast columns, stairs, façade panels, etc.</p>	PSCS	H	M	<p>Lifting operations using cranes will be a requirement during the project. The PSCS must identify this as a risk factor ensuring the ground conditions are tested and appropriate to point loading from mobile cranes. The PSCS must ensure there is a fully risk assessed lift plan to manage all lifting operations on site.</p>
5	<p>Existing Utilities</p> <p>Work near overhead electric cables, risk of Electrocutation</p> <p>Impact with existing services</p>	PSCS/PSDP	H	M	<p>Information on the existence of live overhead ESB cables on site is to be provided to the PSCS via the Tender pack. The sequence of work to be planned to avoid working in close proximity to the lines. Information on existing services and new services installed and connected for the project works will be included in the Safety File. These will include 'as-built' drawings</p>

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION
					indicating the locations and routes as well as physical identification and signage of all services to enable safety procedures to be adopted for any works. The PSCS to arrange for the relocation of the lines prior to working around them. The PSCS must follow the ESB code of practice and provide a risk assessed RAMS document to manage this hazard.
6.	Construction Traffic Working adjacent to live construction and normal traffic.	PSCS/PSDP	H	M	Contractor to prepare and implement a Construction Traffic Management Plan to be agreed with the design team to ensure public safety. The contractor is to supervise vehicle movements during construction and enforce the traffic management plan.
7	Contamination Encountering contamination and/or existing hazardous materials during excavation works Contact with hazardous materials and/ or pollution	PSCS	H	M	Full site investigation surveys and reports completed during the design phase of the project. Reports are updated as required during construction with all information included in the safety file

15.7 PREDICTED IMPACTS - RISK OF MAJOR ACCIDENTS AND/OR DISASTERS

15.7.1 Risk Analysis

Following identification of risks, the next stage is to analyse how likely this is to occur and the consequences, should the risk arise. This will provide a risk score, i.e., the consequences versus the likelihood of the event taking place.

Taking the above table, and applying it below, the red zone represents 'high risk scenarios', the amber zone represents 'medium risk scenarios' and the green zone represents 'low risk scenarios.'

Table 15.5 – Risk Evaluation

Likelihood Rating	Very Likely	5					
	Likely	4					
	Unlikely	3					
	Very Unlikely	2					
	Extremely Unlikely	1					
			Minor	Limited	Serious	Very Serious	Catastrophic
			1	2	3	4	5
			Consequence Rating				

- Risk Number 1 = Likelihood rating 2 * Consequence rating 4 = Amber zone (Medium risk scenario)
- Risk Number 2 = Likelihood rating 2 * Consequence rating 4 = Amber zone (Medium risk scenario)
- Risk Number 3 = Likelihood rating 2 * Consequence rating 4 = Amber zone (Medium risk scenario)
- Risk Number 4 = Likelihood rating 2 * Consequence rating 4 = Amber zone (Medium risk scenario)
- Risk Number 5 = Likelihood rating 2 * Consequence rating 5 = Amber zone (Medium risk scenario)
- Risk Number 5 = Likelihood rating 2 * Consequence rating 4 = Amber zone (Medium risk scenario)

15.7.2 Main risks

The main risks arise during the construction period. Consequences may be limited but severe for the individuals concerned. Geographical widespread environmental consequences are not anticipated.

15.8 INTERACTIONS

Refer to chapter 16 of the EIAR for the anticipated interactions and interdependencies.

15.9 RESIDUAL IMPACTS

Through the implementation of mitigation measures, there are no identified incidents or examples of major accidents and or natural disasters that present a sufficient combination of risk and consequence that would be likely to lead to significant residual impacts or environmental effects.

15.10 CUMULATIVE IMPACTS

Existing and permitted developments were identified through planning records. It is noted an adjoining permitted 52-unit older persons development, located at St. Michael's Estate, Inchicore (Planning Reg. Ref. 4260/19). In addition, on the 15th of July 2022, the National Transport Authority lodged the Liffey Valley to City Centre Core Bus Corridor Scheme Compulsory Purchase Order 2022, located to the north of the site on Emmet Road (Reference no. KA29N.314091). The Case is due to be decided by 25/01/2023. No other relevant cumulative developments were identified.

The primary potential cumulative impact considered is the increase in construction traffic and construction of the developments above. Overall, the cumulative impact of the construction of the proposed development, the 52 no. unit development to the east and the Liffey Valley to City Centre Core Bus Corridor Scheme are predicted to be neutral and of an imperceptible significance (temporary in duration).

16.0 INTERACTIONS OF THE FORGOING

16.1 INTRODUCTION

The purpose of this chapter is to highlight the significant interaction between environmental factors, and the cumulative impact this interaction and the proposed development has on the receiving environment. In preparing the EIAR each of the specialist consultants have and will continue to liaise with each other and will consider the likely interactions between effects predicted as a result of the proposed development during the preparation of the proposals for the subject site and this ensures that mitigation measures are incorporated into the design process.

This approach is considered to meet with the requirements of Part X of the Planning and Development Act 2000 and Part 10, and schedules 6 and 7 of the Planning and Development Regulations 2001 as amended.

Article 3(1) of the EIA Directive (2014/52/EU) states that:

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).

As this EIAR document has been prepared by a number of specialist consultants an important aspect of the EIA process is to ensure that interactions between the various disciplines have been taken into consideration.

Having regard to the approach taken, the aspects of the environment likely to be significantly affected by the proposed development, during both the construction and operational phases, have been considered in detail in the relevant Chapters of this EIAR document.

The relevant consultants liaised with each other and the project architects, engineers and landscape architects where necessary to review the proposed scheme and incorporate suitable mitigation measures where necessary. As demonstrated throughout this EIAR, most inter-relationships are neutral in impact when the mitigation measures proposed are incorporated into the design, construction or operation of the proposed development.

16.2 INTERACTIONS

Section 3.7.2 of the EPA Guidelines 2022 states that the interactions between effects on different environmental factors should be addressed as relevant throughout the EIAR. The EPA Guidelines further note that:

“It is general practice to include a matrix to show where interactions between effects on different factors have been addressed. This is usually done using the actual headings used in the EIAR (which may differ from the factors contained in the Directive (ref section 3.3.6). This is typically accompanied by text describing the interactions.”

Table 16.1 – Matrix of Summary of interactions between the environmental factors

Interaction	Population & Human Health		Biodiversity		Land and Soils		Water		Air Quality/Climate		Noise/Vibration		Landscape and Visual		MA-Traffic		MA-Waste/Utilities		Cultural Heritage		Risk Mgmt	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
Population & Human Health			x	x	x	x	x	x	✓	x	✓	x	x	x	✓	x	✓	✓	x	x	x	x
Biodiversity	x	x			✓	x	✓	✓	✓	x	x	x	x	✓	x	x	x	x	x	x	x	x
Land and Soils	x	x	✓	x			✓	x	✓	x	x	x	x	x	x	x	✓	x	✓	x	x	x
Water	x	x	✓	x	✓	x			x	x	x	x	x	x	x	x	✓	✓	x	x	x	x
Air Quality/Climate	✓	✓	x	x	x	x	x	x			x	x	x	x	✓	✓	x	✓	x	x	x	x
Noise/Vibration	✓	✓	x	x	x	x	x	x	x	x			x	x	✓	x	x	x	✓	x	x	x
Landscape and Visual	✓	✓	x	✓	x	x	x	x	x	x	x	x			x	x	x	x	✓	✓	x	x
MA-Traffic	x	x	x	x	x	x	x	x	✓	✓	✓	x	x	x			x	x	x	x	x	x
MA- Waste/Utilities	✓	x	x	x	✓	✓	✓	x	x	✓	x	x	x	x	✓	x			x	x	x	x
Cultural Heritage	x	x	x	x	x	x	x	x	x	x	✓	x	✓	✓	x	x	x	x			x	x
Risk Mgmt	✓	x	x	x	✓	x	✓	x	✓	x	✓	x	x	x	✓	x	x	x	✓	x		

Con. Construction Phase Op. Operational Phase ✓ Potential Significant Interaction x No Significant Interaction

The following provides the interactions anticipated from the proposed development:

16.2.1 Chapter 3 Population and Human Health

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

16.2.1.1 Air Quality/Climate

The greatest potential impact on air quality on human health during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. However, dust control measures such as wheel washes and covering of fine materials will minimise the impact on air quality.

The effect of construction on air quality will not be significant following the implementation of the proposed mitigation measures. It is proposed to adhere to good working practices and dust mitigation measures to ensure that the levels of dust generated will be minimal and are unlikely to cause an environmental nuisance. There will be no significant impact from dust once the development is completed. Overall, it is envisaged that the proposed development will not have a significant impact on air quality. This is dealt with in Chapter 7.

16.2.1.2 Noise/Vibration

The greatest potential for noise and vibration impact (and interaction with human health) arising from the proposed development will be in the construction phase. However, following the implementation of the proposed mitigation measures in relation to noise, the impact associated with the construction phase of the proposed development is predicted to be moderate, transient and temporary. No significant impacts on the local noise and vibration climate are predicted during the operational phase of the proposed development. The mitigation measures described in the Noise and Vibration chapter (Chapter 8) adequately address this interaction.

16.2.1.3 Material Assets – Traffic & Transport

Traffic flow for construction vehicles in the locality has potential to impact upon road safety. Appropriate mitigation is included to reduce the impact on road safety.

16.2.1.4 Material Assets – Utilities

The operational stage increased population will create greater demand on built services, placing greater demand on water requirements and the public sewer. Irish Water have confirmed capacity. This is dealt with in Chapter 12.

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

16.2.2 Chapter 4 Biodiversity

The potential significant impacts on biodiversity arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation, there are expected to be no residual negative effects to biodiversity which can be considered to be significant.

16.2.2.1 Land and Soils

Site preparatory works have the potential to cause impact on the biodiversity of the site, through removal and disturbance of habitats and species.

16.2.2.2 Hydrology

Any negative impact on water quality arising from accidental spillages etc. may impact biodiversity. A series of mitigation measures are proposed in Chapter 5 – Hydrology of this EIAR document, as well as in this Chapter, to

ensure the quality (pollution and sedimentation) and quantity (surface run-off and flooding) of water is of an appropriate standard.

16.2.2.3 Air Quality and Climate

An assessment of the potential impact of the Proposed Development on air quality and climate is included in Chapter 7 of this EIAR.

16.2.2.4 Landscape and Visual

An assessment of the potential impact of the Proposed Development on the surrounding landscape character is outlined in Chapter 9 - Landscape and Visual. 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 both referenced in this Chapter and described in full in Chapter 9.

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

16.2.3 Chapter 5 Land and Soils

During the construction phase, the following aspects would interact with land and soils and in the absence of mitigation may give rise to likely significant effects:

16.2.3.1 Biodiversity

Site preparatory works (i.e. site clearance, re-profiling etc.) have the potential to cause impact on the biodiversity of the site, through removal and disturbance of habitats and species.

16.2.3.2 Water & Hydrology

Site preparatory works (i.e. site clearance, re-profiling etc.) during the construction stage have the potential to impact on the hydrology and hydrogeology due to the risk of suspended solids becoming entrained in surface water runoff and accidental spills etc.

16.2.3.3 Air Quality

Excavation works and exposure of soil during the construction phase can influence the microclimate in an area. The construction phase may result in the spread of dust onto surrounding land uses and public roads. The air quality assessment indicates that there is no significant impact associated with these matters. The implementation of the dust management and dust control measures will ensure that the proposed development will not give rise to the generation of any significant quantities of dust. This is dealt with in Chapter 7.

The potential significant impacts on land and soils arising from these interactions with air quality/climate have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant temporary or permanent residual negative impacts will occur.

16.2.3.4 Material Assets – Utilities

There are interactions between lands and soils and material assets, with the construction of drainage and utilities impacting the soil and subsoil as these materials will be removed to facilitate construction. The likely impact will be permanent slight, and negative.

There are interactions between lands and soils and material assets, with the delivery of stone fill under buildings and roads and footpaths resulting in additional construction vehicles on roads adjacent to the site. The likely impact will be negative, temporary and slight.

16.2.3.5 Archaeological and Cultural Heritage

Site clearance works may impact on sub-surface archaeology. No potential operational interactions were identified. The potential significant impacts on land and soils arising from these interactions have been considered within the

relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

16.2.4 Chapter 6 Water, Surface Water / Groundwater

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

16.2.4.1 Biodiversity

A deterioration in water quality in nearby watercourses, which would adversely impact aquatic biodiversity, could occur during the construction phase of the proposed development due to rainwater run-off containing sediments, concrete and hydrocarbon spillages, and during the operational phase due to the discharge of domestic wastewater.

During the construction phase, surface water quality would be protected through the implementation of mitigation measures, which include the regular maintenance and inspection of construction plant, the appropriate storage of potentially polluting substances, the supervision of all concrete works and use of appropriate silt control features where required. Therefore, no potential significant impacts upon water quality is anticipated during the construction phase. There would be no potential impacts to water quality during the operational phase of the development.

16.2.4.2 Land & Soils

Site preparatory works (i.e. site clearance, re-profiling etc.) during the construction stage have the potential to impact on the hydrology and hydrogeology due to the risk of suspended solids becoming entrained in surface water runoff and accidental spills etc.

There is an interaction between land/soils on the site and groundwater, where removal of soil/subsoils can increase groundwater vulnerability and result in sediment run-off. There is also an interaction between land/soils and water where potentially contaminated soils/subsoils could contaminate surface water and groundwater. This is dealt with in Chapter 5 Land & Soils.

16.2.4.3 Material Assets - Utilities

The construction of the proposed services (water supply, drainage and IT etc.) may affect the local hydrological and hydrogeological environment as there is a risk of suspended solids run off.

During the operational phase the potential interactions are;

16.2.4.4 Material Assets - Utilities

During the operational phase, there will be an increased demand on potable water supply and on the municipal drainage system. The potential significant impacts on water and hydrology arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

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

16.2.5 Chapter 7 Air Quality & Climate

During the construction phase, the following aspects would interact with air quality and climate:

16.2.5.1 Population and Human Health

The interaction between human beings and ambient air quality will vary between the construction and operational phases of the development. The construction phase may cause nuisance to the existing local population including the soiling of properties with dust, however, provided that the construction phase air quality control and mitigation measures are implemented, it is predicted that the impact on humans and air quality will be short-term and minor.

The interaction between human beings and air quality during the operational phase of the development will be minimal with a relatively low quantum of combustion engine vehicles at the proposed development, once fully occupied. Although there will be an increase in traffic movement on the existing road network as a result of the operational phase, the predicted impact will be long-term and imperceptible.

16.2.5.2 Material Assets Traffic & Transport:

Emissions from construction traffic may impact local air quality and climate in terms of increased emissions of greenhouse gases from vehicles.

During the operational phase the potential interactions are:

16.2.5.3 Population & Human Health:

There is potential for impact on human health from a deterioration in air quality associated with emissions from vehicles.

16.2.5.4 Material Assets Traffic & Transport:

Emissions from traffic associated with future occupants may impact local air quality and climate in terms of increased emissions of greenhouse gases from vehicles.

16.2.5.5 Material Assets – Utilities

The built services have an interaction with climate in the availability and use of non-greenhouse gas reliant power and heat sources. The potential significant impacts on air quality and climate arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils. No other significant interactions with air quality have been identified.

16.2.6 Chapter 8 Noise/Vibration

The principal interactions between Noise & Vibration impacts, Human Beings and Architectural Heritage have been addressed in this chapter which describes in detail the mitigation measures that shall be implemented to ensure that human health and residential amenity are not adversely impacted by any aspect of the construction or operational phases of the development.

In compiling this environmental impact assessment, reference has been made to the project description provided by the project co-ordinators, project drawings provided by the project architects and information relating to construction activities provided by the engineers. Noise emission sources from the proposed development during the construction and operational phases will be from construction plant and activity, building services and traffic accessing the development. The noise impact assessment has been prepared in consultation with the design team and traffic engineers. Reference can be made to the relevant chapters for additional information.

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

16.2.6.1 Population & Human Health

There is potential for impact on human health associated with noise generated during the construction phase.

16.2.6.2 Traffic & Transport:

Construction traffic may give rise to localised noise and vibration effects.

16.2.6.3 Cultural Heritage – Architectural Heritage

Construction works have the potential to impact on local structures (including protected structures) through vibration.

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

16.2.7 Chapter 9 Landscape and Visual

During the construction phase the following potential impacts are noted as;

16.2.7.1 Population & Human Health

The emergence of plant to facilitate the development resulting in short-term, slight to not-significant, neutral visual effects for the existing resident population and users of the surrounding road network.

During the operational phase the potential interactions are:

16.2.7.2 Population & Human Health

The landscape plan will impact on the quality of the private and communal open spaces, which will impact on people's health and well-being;

16.2.7.3 Biodiversity

The landscaping has significant interaction with biodiversity in relation to the potential of the proposed planting maximising biodiversity benefits.

16.2.7.4 Cultural Heritage – Architectural Heritage:

There is the potential for negative visual impacts to the setting of the protected structures during the construction phase. The operational phase will result in an altered visual appearance of the subject site, the design of which, has had regard to the setting of the protected structures.

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

16.2.8 Chapter 10 Material Assets – Traffic and Transportation

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

16.2.8.1 Noise & Vibration:

Construction traffic, excavation works and the build out of the blocks may result in short-term localised noise and vibration effects. The effect of this interaction would be local, neutral, not significant and at worst short term in duration.

16.2.8.2 Air Quality and Climate:

Emissions from construction traffic may impact local air quality and climate in terms of increased emissions of greenhouse gases from vehicles. The effect of this interaction would be local, neutral, not significant and at worst short term in duration.

During the operational phase the potential interactions are;

16.2.8.3 Air Quality and Climate:

Emissions from traffic associated with future occupants may impact local air quality and climate in terms of increased emissions of greenhouse gases from vehicles. However, having regard to the insignificant number of parking spaces proposed to serve the development, this interaction would be negligible.

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

16.2.9 Chapter 11 Material Assets – Waste Management

The identified interactions between the management of waste arising during both the construction and operational stages are as follows;

16.2.9.1 Population & Human Health,

During the construction phase, potential impacts relate to management of waste in the construction and operational phase to mitigate nuisance.

16.2.9.2 Land & Soils,

During the construction phase, potential impacts relate to excavation to facilitate the development.

16.2.9.3 Water, Hydrogeology & Hydrology

Should waste be incorrectly handled or stored at the development site during construction works, it has the potential to cause an adverse impact upon water quality in the area through leaching of materials to groundwater or surface water. Waste will be segregated and stored in suitably contained waste receptacles at the site compound, considerably reducing the potential risk of pollution to water. It is not considered that there would be any significant risk to water quality as a result of waste management during the operational phase, given that waste will be collected by private, licensed waste contractors and recovered, recycled or disposed of at appropriately licenced waste facilities, which would have environmental controls in place as standard.

16.2.9.4 Traffic,

Potential impacts relate specifically movement of waste associated with the construction stage. This is dealt with in Chapter 11.

16.2.9.5 Land & Soils,

During the operational phase, suitably contained wheelie bins / waste receptacles will be provided to the residential area and childcare facility by private waste contractors, thus there would be no significant risk of pollution to soils. Waste will be collected on a regular basis. Therefore, waste would not be envisaged to accumulate to high enough volumes to cause nuisance. This is dealt with in Chapter 11.

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

16.2.10 Chapter 12 - Material Assets – Utilities

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

16.2.10.1 Land & Soils

The construction works have the potential to impact upon the Land & Soils of the area. Prior to commencement of Site works, the works Contractor will provide a Construction Methodology document detailing their proposed construction methods and any additional requirements of the Design Team or Planning Regulator. The Contractor will also prepare a CEMP which sets out the overarching vision of how the construction of the project will be managed in a safe and organised manner by the Contractor with the oversight of the Developer.

16.2.10.2 Water & Hydrology

The construction works have the potential to impact upon the Water & Hydrology of the area. Prior to commencement of Site works, the works Contractor will provide a Construction Methodology document detailing their proposed construction methods and any additional requirements of the Design Team or Planning Regulator. The Contractor will also prepare a CEMP which sets out the overarching vision of how the construction of the project will be managed in a safe and organised manner by the Contractor with the oversight of the Developer.

16.2.10.3 Noise & Vibration

Construction traffic, excavation works and the build out of the blocks may result in short-term localised vibration effects which could have potential to impact below ground services. Monitoring stations will be set up around the site to monitor vibration levels and ensure they are within acceptable levels.

During the operational phase, the following aspects would interact with built services and in the absence of mitigation may give rise to likely significant effects.

16.2.10.4 Water & Hydrology

The proposed SuDS for the development incorporates flow control and attenuation of discharge from the site to the receiving drainage network, limiting run-off to the equivalent green field run-off rate. Silt traps are proposed upstream of attenuation zones to in order to trap sediment and other gross pollutants, and prevent from entering the downstream watercourse; thus improving the water quality discharging from site. A Class 1 bypass fuel separator is to be provided immediately downstream of all attenuation systems prior to surface water discharge from each unit sub-catchment to the surface water network.

16.2.11 Chapter 13 and Chapter 14 - Cultural Heritage

During the construction phase, the following aspects would interact with cultural heritage and in the absence of mitigation may give rise to likely significant effects.

Land and Soils: Site clearance works may impact on sub-surface archaeology.

No operational interactions were identified. The potential significant impacts on cultural heritage - archaeology arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.

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

There are interactions between this chapter and the landscape and visual chapter in view of the visual effects on the settings of structures of architectural heritage significance and the potential for landscaping to mitigate such effects

There are interactions between this chapter and the noise and vibration chapter in view of the proximity of the protected structures (Richmond Barracks and the protected wall) and the proposed works in close proximity during the construction phase.

16.2.11.1 Landscape and Visual:

The removal of some elements of the historic wall to facilitate permeability will result in the loss of historic features and fabric of significance

The impact of the proposed development on the architectural heritage character of the wider setting during the operational phase has been mitigated through various design decisions, through a high quality design, careful siting of higher elements of the scheme as well as inclusion of open spaces, and the use of high quality materials.

With mitigation measures in place, the effect is not significant and there will be no likely significant residual impact from the proposed development.

16.2.11.2 Noise and Vibration

During the construction phase there is the potential for impacts to structures in the area including protected structures from vibration. With mitigation measures in place, the effect is not significant and there will be no likely significant residual impact from the proposed development.

16.2.12 Chapter 15 Risk Management

There are interactions with Population and Human Health, Land, Soils, Geology and Hydrogeology, Surface Water, Noise, Climate and Air, Material Assets, Traffic and Transport, Landscape and Visual, and Cultural Heritage. However, subject to implementation of mitigation measures, good working practices and codes, the interactions between these areas have been sufficiently considered in relation to risk management.

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

16.2.13 Interactions & Cumulative Impacts

Each Chapter of the EIA includes a cumulative impact assessment of the proposed development with other relevant existing and/or approved projects in the area.

The potential cumulative impacts primarily relate to traffic, dust, noise and other nuisances from the construction of the development, with other planned or existing projects, and each of the EIA chapters has regard to these in the assessment and mitigation measures proposed.

The potential cumulative significant effects through interactions have been considered and there are no significant potential for cumulative significant effects to arise from multiple non-significant effects. In respect of the project.

16.3 SUMMARY

As outlined above, the proposed development has the potential to impact on various environmental aspects, with interactions and inter-relationships between these aspects as described above. The EIA has considered these interactions and inter-relationships throughout the appraisal, firstly through the design and layout of the proposed developments, to avoid impacts where possible, and also in the definition of suitable mitigation measures to minimise the impacts.

17.0 SUMMARY OF EIA MITIGATION AND MONITORING MEASURES

17.1 INTRODUCTION

The central purpose of EIA is to identify potentially significant adverse impacts at the pre-consent stage and to propose measures to mitigate or ameliorate such impacts. This chapter of the EIAR document has been prepared by John Spain Associates and sets out a summary of the range of methods described within the individual chapters of this EIAR document which are proposed as mitigation and for monitoring. It is intended that this chapter of the EIAR document will provide a useful and convenient summary to the competent/consent authority of the range of mitigation and monitoring measures proposed. This chapter of the EIAR was prepared by Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt., Executive Director with John Spain Associates.

EIA related conditions are normally imposed by the competent/consent authority as part of conditions of planning consent and form a key part of the Impact Anticipation and Avoidance strategy. Conditions are principally used to ensure that undertakings to mitigate are secured by explicitly stating the location, quality, character, duration and timing of the measures to be implemented.

Monitoring of the effectiveness of mitigation measures put forward in the EIAR document, both by the competent authorities and the developer, is also an integral part of the process. Monitoring of environmental media and indicators arise either from undertakings or from conditions.

In the case of mitigation and monitoring measures it is important for all parties to be aware of the administrative, technical, legal and financial burdens that can accompany the measures proposed. It is also important to ensure that, where monitoring is provided for, it is clearly related to thresholds, which if exceeded cause a clearly defined set of actions to be implemented.

17.2 MITIGATION STRATEGIES

17.2.1 Introduction

There are three established strategies for impact mitigation - avoidance, reduction and remedy. The efficacy of each is directly dependent on the stage in the design process at which environmental considerations are taken into account (i.e. impact avoidance can only be considered at the earliest stage, while remedy may be the only option available to fully designed projects).

17.2.2 Mitigation by Avoidance

Avoidance is generally the fastest, cheapest and most effective form of impact mitigation. Environmental effects and consideration of alternatives have been taken into account at the earliest stage in the project design processes. The consideration of alternatives with respect to the development of the subject lands has been described in Chapter 2.

17.2.3 Mitigation by Reduction

This is a common strategy for dealing with effects which cannot be avoided. It concentrates on the emissions and effects and seeks to limit the exposure of the receptor. It is generally regarded as the "end of pipe" approach because it does not seek to affect the source of the problems (as do avoidance strategies above). As such this is regarded as a less sustainable, though still effective, approach.

17.2.4 Reducing the Effect

This strategy seeks to intercept emissions, effects and wastes before they enter the environment. It monitors and controls them so that acceptable standards are not exceeded. Examples include wastewater treatment, filtration of air emissions and noise attenuation measures.

17.2.5 Reducing Exposure to the Impact

This strategy is used for impacts which occur over an extensive and undefined area. Such impacts may include noise, visual impacts or exposure to hazard. The mitigation is affected by installing barriers between the location(s) of likely receptors and source of the impact (e.g. sound barriers, tree screens or security fences).

17.2.6 Mitigation by Remedy

This is a strategy used for dealing with residual impacts which cannot be prevented from entering the environment and causing adverse effects. Remedy serves to improve adverse conditions which exist by carrying out further works which seek to restore the environment to an approximation of its previous condition or a new equilibrium.

17.2.7 Mitigation and Monitoring Measures

The following provides a list, for ease of reference, of the mitigation and monitoring measures recommended in each chapter of the EIAR.

17.3 DESCRIPTION OF THE PROJECT AND ALTERNATIVES

17.3.1 Construction Management Strategy

It is envisaged that the development of the lands subject of the proposed development will occur over a 48-54 month period. Given the nature of the project and the need for flexibility to respond to market demand, the development phases are indicative. A Construction Management Plan has been prepared by OCSC Consulting Engineers and is included in Appendix B of Volume III of the EIAR. This CEMP will be developed by the Contractor to include the mitigation contained in the EIAR.

Construction Traffic Management Plan

A Construction Traffic Management Plan (CTMP) will be prepared by the main contractor and agreed with the Planning Authority prior to commencement of development in the event of a grant of permission. It will contain the mitigation in the EIAR.

17.4 POPULATION AND HUMAN HEALTH

In order to protect the amenities enjoyed by nearby residents, premises and employees a Construction Environment Management Plan will be submitted by the contractor and implemented during the construction phase and it will contain the mitigation measures in this EIAR.

With reference to the construction phase of the proposed development, the objectives of the Construction Waste By Products Management Plan prepared by Byrne Environmental (and also Chapter 11 of the EIAR) is to ensure that waste generated during the proposed construction and operation phases will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts 1996 - 2013 are complied with.

17.4.1 Operational Phase

The operational phase is considered to have likely positive impacts on population in relation to the provision of additional residential units, open space, childcare provision, to cater for the demands of a growing population in accordance with the residential zoning objectives pertaining to the site.

During the operational phase of the development the design of the scheme has undergone a Road Safety Audit and has had regard to Design Manual for Urban Roads and Streets (DMURS) during its design. This will promote a pedestrian friendly environment, promoting sustainable development and reducing the influence of cars. This has the potential to reduce accidents within the proposed development.

No further specific mitigation is required having regard to the mitigation included within the other chapters of this EIAR.

In relation to the impact of the development on population and human health it is considered that the monitoring measures outlined in this EIAR in regard to the other environmental topics such as water, air quality and climate and noise and vibration sufficiently address monitoring requirements.

17.5 BIODIVERSITY

17.5.1 Construction Phase

17.5.1.1 Protection of Surface Waters and Aquatic Fauna

The following mitigation measures will protect surface waters during the Construction Phase of the Proposed Development:

All works carried out as part of the Proposed Development will comply with all Statutory Legislation including the Local Government (Water Pollution) acts, 1977 and 1990 and the contractor will cooperate fully with the Environment Section of Dublin City Council in this regard.

Personnel working on the Site will be trained in the implementation of environmental control and emergency procedures. Procedures and relevant documents produced will be formulated in consideration of standard best international 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;
- 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.

The following standard measures will protect surface water and groundwater during the Construction Phase of the Proposed Development:

- Silty water generated on Site will be treated using silt trays/settlement ponds/settlement tanks and temporary interceptors and traps will be installed until such time as permanent facilities are constructed.
- All containment and treatment facilities will be regularly inspected and maintained.
- Any other diesel, fuel or hydraulic oils stored on site will be stored in bunded storage tanks- the bunded area will have a volume of at least 110% of the volume of the stored materials as per best practice guidelines (Enterprise Ireland, BPGCS005);
- Portaloos and/or containerised toilets and welfare units will be used to provide facilities for site personnel. All associated waste will be removed from site by a licenced waste disposal contractor.
- Runoff from machine service and concrete mixing areas will not enter the drainage network.
- Discharge water generated during placement of concrete will be stored and removed off site for treatment and disposal.
- There will be no washing out of any concrete trucks on site.
- Specific areas for storage, delivery, loading/unloading of materials will be designated, which will have appropriate containment/spill protection measures where required.
- Leachate generation from stockpiles or waste receptacles will be prevented by using waterproof covers.
- If contaminated soils are encountered during construction works or if material becomes contaminated by, for example a fuel spill or hydraulic fluid leak the contaminated materials will be segregated, placed on an impermeable membrane so as to prevent contamination of the underlying ground and covered to prevent contaminants being mobilised by rainwater run-off. The materials will remain covered until such time as they can be compliantly removed from site by appropriately authorised waste management contractors.
- A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances.
- Refuelling of plant during the Construction Phase will only be carried out at designated refuelling station locations on site. Each station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on site.
- Appropriate bunding, storage and signage arrangements for all deleterious substances will be used.

- Robust and appropriate Spill Response Plan and Environmental Emergency Plans will be implemented for the duration of the works.
- A register will be kept of all hazardous substances either used on site or expected to be present. The register shall be available at all times and shall include as a minimum: valid safety sheets; Health & Safety, environmental controls to be implemented when storing, handling, using and in the event of spillage of materials; emergency response procedures/precautions for each material; the Personal Protective Equipment (PPE) required when using the material.
- All existing services will be mapped, and a plan will be put in place to decommission/divert or manage any drains or sewers which are associated with the Site.
- A plan for dealing with any unknown drains or services which may be encountered during the works will be set out and implemented.
- Any drains or sewers which could act as pathways for contamination from the Site will be protected where required. Surface water on Site will likely be required to be passed through settlement tanks and similar, with controlled discharge to the public network. This will be subject to approval of a construction discharge license from Dublin City Council.

All wastewater generated on-site during the Construction Phase will be stored and disposed of appropriately. Under no circumstances will any untreated wastewater generated onsite (from equipment washing, road sweeping etc.) be released into nearby drainage ditches or watercourses. There will be no uncontrolled discharges to ground (groundwater) or surface water.

Only soil and other materials identified as suitable for use in accordance with regulatory standards and that will not pose a risk to the receiving environment will be used during the Construction Phase.

Surface water runoff management will be implemented to prevent runoff entering excavations during construction and to the existing surface water drainage network. Surface water will require diversion around the open excavations using standard temporary drainage methods to ensure that surface water is effectively conveyed around works areas and with no impacts to the overall existing surface water flow regime.

All below (below ground) drainage infrastructure will be constructed in accordance with current IW requirements to ensure that there are no potential impacts to groundwater quality..

If shallow groundwater is encountered during excavations, dewatering methodology to be implemented where required by the contractor and will ensure that any dewatering is confined to the localised zone and does not impact offsite receptors. Discharges from the Proposed Development will be in accordance with relevant statutory approvals from Irish Water for discharges to sewer and Dublin city Council for discharges to surface water.

17.5.1.2 Removal of Invasive Alien Plant Species

Three invasive plant species were recorded at the Site of the Proposed Development during the surveys carried out in 2020, 2021 and 2022, namely Butterfly Bush *Buddleja davidii*, Montbretia *Crocasmia x crocosmiiflora* and Sycamore *Acer pseudoplatanus*. No species listed on Schedule III of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011, as amended) were recorded at the Site. Butterfly Bush was abundant throughout the Site, the largest stand was recorded growing within the recolonising bare ground habitat, however, plants were also recorded growing within walls and other areas of hardstanding within the Site.

Physical removal of Butterfly Bush, Montbretia and Sycamore will be undertaken during Site clearance activities. Disposal of all plant material will be undertaken with due caution to prevent accidental spread of the plant. Where Butterfly Bush is growing within walls or structures for retention and physical removal of the *entire* plant is not possible, a combination of physical and chemical control would be the most appropriate management approach. According to TII (2020a) “*effective control can be achieved by cutting Buddleia plants to a basal stump during active growth (late spring to early summer) and immediately treating the total cut surface with herbicide concentrate. Monitoring will be required and retreatment, as necessary. Do not leave cut stems and branches on the ground as they will re-root and produce new plants.*”

17.5.1.3 Fauna

Construction Phase Lighting

To protect bats and other nocturnal fauna from lighting associated with the **Construction Phase** of the Proposed Development, any Construction Phase external lighting will follow the most recent BCT Lighting Guidelines (BCT, 2018):

- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

Reduction of noise and dust related impacts

Reduction of noise impacts

To mitigate the potential effects (disturbance) to faunal species in the vicinity of the project site, the following measures will be implemented:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoidance of 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 originates from 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 nesting birds or any other fauna species in the vicinity of the Site of the Proposed Development will be reduced to a minimum.

Reduction of dust related impacts

The following general dust control measures will be followed for the duration of the Construction Phase of the Proposed Development, and will ensure no significant dust related impacts occur to nearby sensitive receptors including local faunal species:

- In situations where the source of dust is within 25m of sensitive receptors screens (permeable or semi-permeable) will be erected.
- Haulage vehicles transporting gravel and other similar materials to site will be covered by a tarpaulin or similar.
- Access and exit of vehicles will be restricted to certain access/exit points.
- Vehicle speed restrictions of 20km/hr will be in place.
- Water bowsers will be available during periods of dry weather throughout the construction period.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bower will operate to ensure moisture content is high enough to increase the stability of the soil thereby reducing the amount of dust.
- Stockpiles will be stored in sheltered areas of the site, covered, and watered regularly or as needed if exposed during dry weather.
- If necessary, gravel will be used at site exit points to remove caked-on dirt from tyre tracks.

- Equipment will be washed at the end of each work day, if necessary.
- Hard surfaced roads will be wet swept to remove any deposited materials.
- Unsurfaced roads will be restricted to essential traffic only.
- Wheel-washing facilities should be located at all exits from the construction site, where necessary.
- Dust production as a result of site activity will be minimised by regular cleaning of the site access roads using vacuum road sweepers and washers. Access roads should be cleaned at least 0.5km on either side of the approach roads to the access points.
- Public roads outside the site shall be regularly inspected for cleanliness, as a minimum daily, and cleaned as necessary. A road sweeper will be made available to ensure that public roads are kept free of debris.
- The frequency of cleaning will be determined by the site agent and is weather and activity dependent
- The height of stockpiles will be kept to a minimum and slopes should be gentle to avoid windblown soil dust.
- The following will be dampened during dry weather:
 - Unpaved areas subject to traffic and wind
 - Stockpiles
 - Areas where there will be loading and unloading of dust-generating materials
- Under no circumstances should wastewater from equipment, wheel or surface cleaning enter the surface water drainage network.

Vegetation Clearance/Building Demolition

Any clearance of vegetation will be carried out outside the main breeding season, i.e. 1st March to 31st August, in compliance with the Wildlife Act 2000. Should any vegetation removal be required during this period, the NPWS will be consulted, and instruction taken from them. If the buildings on Site are to be demolished during the breeding bird season, the buildings will be inspected for breeding birds (e.g. Herring Gull, Swallows) prior to demolition. Should nesting birds be discovered, the nest will be protected until any nesting birds have fledged and departed the site.

While Building 1 and 2 were considered to be of Low bat Roost suitability and there was no emergence from same, a pre-demolition bat survey will be carried out if these buildings are to be demolished between March and October to ensure no bats are present at this time.

17.5.1.4 Biosecurity

The following will be adhered to, to avoid the introduction of invasive species to the Proposed Development site.

- Any material required on the site will be sourced from a stock that has been screened for the presence of any invasive species by a suitably qualified ecologist and where it is confirmed that none are present.
- All machinery will be thoroughly cleaned and disinfected prior to arrival on site to prevent the spread of invasive species.

17.5.2 Operational Phase

17.5.2.1 Bats

A range of options for enhancing bat roosting opportunities at the Site have been provided in the Bat Report and include installation of integrated bat bricks or boxes onto site structures, installation of pole mounted bat boxes and installation of bat boxes onto trees in nearby lands owned by Dublin City Council.

The Project Ecologist discussed the potential for installing integrated bat bricks or boxes onto buildings with the Architect. However, it was deemed that there were no suitable locations for bat boxes within/on the proposed buildings. This was namely due to proximity of the proposed bat bricks/boxes to balconies and windows of residential units and lack of suitable commuting or foraging habitat near the proposed boxes. As such, to enhance the Site for bats, 5 no. pole mounted bat boxes will be installed along the southern boundary of the Site near Goldenbridge Cemetery²¹. Bat boxes will be installed under the supervision of a suitably qualified bat expert.

²¹ <https://www.nhbs.com/pole-mounted-maternity-bat-box>

17.5.3 Monitoring

17.5.3.1 Surface Water Protection

Regular monitoring will be carried out by the contractor to ensure water quality protection measures (e.g., drain protection) are working throughout entire construction phase. All containment and treatment facilities will be maintained and inspected regularly based on Site and weather conditions for any signs of contamination or excessive silt deposits and records of these checks will be maintained.

17.5.3.2 Invasive Flora

Monitoring for regrowth of all invasive flora treated/removed at the Site will be carried out for 2 years following treatment/removal, by a suitably qualified ecologist. Further monitoring may be required if treatment has not been successful. A site may be considered remediated after two consecutive growing seasons with no sign of regrowth from all of the previously identified stands (TII, 2020b).

17.5.3.3 Bat Mitigation

Monitoring will be carried out post-construction works. This monitoring will involve the following:

- Inspection of bat boxes within one year of erection of bat box scheme. Register bat box scheme with Bat Conservation Ireland. This should be undertaken for a minimum of 2 years.
- A full summer bat survey will be carried out post-works.
- Specific monitoring in relation to the proposed lighting scheme will be undertaken to determine whether lux levels have increased at Goldenbridge Cemetery.

17.6 LAND AND SOILS

This section describes a range of recommendations and mitigation measures designed to avoid, reduce, or offset any potential adverse geological impacts identified. The potential impacts, mitigation measures, and resulting residual impacts have been combined in **Table 5.11** Detailed Impact Assessment in presented at the end of Section 5.9 and are outlined below.

17.6.1 Incorporated Design Mitigation

To reduce the impact of the development on the lands and soils of the site, the proposed design will be optimised to minimise the required excavation, and thereby reduce the volume of soils exported off-site, the volume of materials imported to the site, and machinery operation time. It is proposed that where soils are to be exported off-site, a local facility will be chosen where feasible to reduce the carbon footprint associated with the transport and handling of the material.

Mitigation in the design of the proposed development also includes:

- Design of the proposed development levels to minimise cut/fill type earthworks and the volume of material to be disposed off-site where possible.
- Design of landscaping works for the development to protect the soils again from weathering and erosion.
- Design of site services / drainage works in accordance with the relevant design guidance such as the GSDS, The SUDS Manual (CIRIA C753), and the Irish Water Code of Practice (IW-CDS-5030-03 Revision 2).
- Removal of excavated material off-site and disposal in accordance with all applicable waste transport and disposal requirements.
- Appropriate design of site services / drainage / sewers incorporating features such as a light liquids separator or SuDS treatment train approach to protect the soils and geology from risk of contamination arising from the development.
- Appropriate measures against radon will be taken at detailed design stage.

17.6.2 Construction Phase Mitigation

To reduce the impacts on the soils, geology, and hydrogeological environment, a number of mitigation measures will be adopted as part of the construction works on site. The measures will address the main activities of potential impact which include:

- Surveying of watermains prior to upgrades and testing prior to commissioning.
- Control of soil excavation and export from site;
- Sources of fill and aggregates for the project;
- Fuel and chemical handling, transport, and storage; and
- Control of water during construction.

A CEMP is included with the planning application and includes a range of site-specific mitigation measures relating to soils. In advance of work starting on site, the works Contractor will develop the site-specific CEMP which sets out the overarching vision of how the construction of the project will be managed in a safe and organised manner by the Contractor with the oversight of the Developer. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures contained in this EIAR and any subsequent conditions relevant to the project as stipulated by An Bord Pleanála.

17.6.2.1 Management of Watermain Upgrades

Full and detailed surveys of the existing watermains to be upgraded, diverted, or removed will be undertaken in advance of the works with works appropriately planned and sequenced to ensure that risk of any temporary loss of supply to local residents is negated. The watermains will be tested according to the requirements of Irish Water prior to commissioning. Compliance with the conditions of the connection application will effectively mitigate potential risks to the public watermains network while compliance with the CEMP will mitigate potential risks associated with the construction activity such that the impact associated with these works will be negative, temporary, and not significant.

17.6.2.2 Control of Soil Excavation

Soil stripping; excavation to facilitate the foundations and the construction of a new sewer and water mains connections, roadways, and all other associated services earthworks; and stockpiling of soil will be carried out during the construction phase on the development site. Soil stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated through the implementation of an appropriate earthworks handling protocol during construction:

- Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development and located so as not to necessitate double handling.
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter watercourses. It is anticipated that stockpiles will be formed within the boundary of the excavation and there will be no direct link or pathway from this area to any surface water body.
- It is anticipated that only local/low level of stockpiling will occur as the bulk of the material will be excavated either straight into trucks for transport off site or will be reused in other areas of the site as fill.
- Excavated soils will be segregated according to contamination level to ensure the removal from site of those materials which pose a risk to human health or the environment and that cross-contamination of materials does not occur.
- The project will incorporate the 'reduce, reuse, and recycle' approach in terms of soil excavations on site. The construction will be carefully planned to ensure only required volumes of soil will be excavated with as much material left in situ as possible. All excavated arisings will be reused on site where possible/if suitable in landscaping and public open spaces, for backfill to trenches under non-trafficked areas, etc.
- Where bedrock / boulders are encountered in excavations, crushing and reuse will be considered depending on the quantity of material excavated. Screened material may be reused as a fill material e.g., in road construction and backfill to service trenches.
- Stockpiles of excavated subsoil material to be protected for the duration of the works and located separate to the topsoil stockpiles.
- Disturbed subsoil layers to be stabilised as soon as practicable - backfilling of service trenches, construction of road capping layers, construction of building foundations, and completion of landscaping are to be carried

out promptly to minimise the duration that subsoil layers are exposed to the effects of weather and construction vehicles.

- Dust suppression measures (e.g. damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment are free of nuisance dust and dirt on roads. Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes on the site.

The undertaking of soil excavation and soil handling on the development and watermains upgrade sites in compliance with the CEMP will mitigate potential risks associated with these activities such that the impact associated with these works will be neutral, temporary, and not significant.

17.6.2.3 Export of Material from Site

Where material cannot be reused on site, it will be sent for recovery/disposal at an appropriately permitted/licensed site. Further details will be included in the CEMP and the Construction and Demolition Waste Management Plan which provide mitigation for Chapter 11 Material Assets – Waste Management.

Site investigations on the development site have established that there is contamination present on site consisting of inert, non-hazardous, and hazardous materials. The standalone OCSC Waste Soil Classification Report (OCSC, 2020) contained in Appendix C Volume III of this EIAR includes details on the Waste Soil Classification assessment completed for the site.

All material removed from site will be classified before removal to ensure it is disposed of to an appropriately licensed landfill or recovery facility in accordance with The Waste Management (Hazardous Waste) Regulations 1998. Nonetheless, material which is exported from site, if not correctly managed or handled, could negatively impact human beings as well as water and soil environments. Additional Soil Classification will be undertaken as part of the site development and the watermains upgrade work, and control of any material will be carried out in accordance with the Waste Management Act.

As part of the development and watermains upgrade works, any material excavated for offsite disposal will be disposed of in line with the Waste Soil Assessment criteria thus mitigating potential risks to human health or the environment associated with contamination on the site. Waste categories for the disposal of soils are outlined in Table 17.1 along with possible disposal facilities for each category of waste.

Table 17.1 – Soil Waste Categories

Waste Category	Title	Classification Category	Potential Outlet
Category A	Inert Waste Criteria	Reported concentrations less than inert waste guidelines, which are based on waste acceptance criteria set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). Results found to be non-hazardous using the HazWasteOnline application.	Potentially suitable for reuse or recovery subject to Planning and/or Waste Permissions and acceptance criteria.
Category B	Inert (with elevated PAHs)	Acceptance Criteria as laid out in Waste Licence W0129-02 and W0254-01. Reported concentrations less than inert waste guidelines, which are based on waste acceptance criteria set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002) with the exception of PAHs (Total 17 <100mg/kg). Results found to be non-hazardous using the HazWasteOnline application.	Disposal at Integrated Material Solutions or Walshestown Restoration

Waste Category	Title	Classification Category	Potential Outlet
Category C1	Non-Haz Criteria	Analytical results greater than Category A criteria but less than non-hazardous waste guidelines, which are based on waste acceptance criteria set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002) no limit for TOC. Results found to be non-hazardous using the HazWasteOnline application.	Disposal/Recovery at licensed Landfill (Ballynagran, Knockharley, Drehid). Material can be sent for recovery as engineering material rather than disposed of (no landfill tax)
Category C2	Non-Haz Criteria but with trace asbestos	Results as per C1 but with trace asbestos	Material will need to be disposed of at a licensed landfill if trace asbestos confirmed. If asbestos level is quantifiable then it may have to be disposed in N. Ireland or further abroad.
Category D	Hazardous	Analytical results found to be hazardous using the HazWasteOnline application.	None in Ireland (export) with the exception of Enva in Portlaoise.

In total 183No. soil samples were collected and classified in accordance with S.I. 233 of 2015 using the HazWasteOnline software, classification engine WM3.v1.1. The leachate analysis results and a selection of total pollutant content results have been compared with the thresholds for acceptance of waste at inert, non-hazardous and hazardous landfill facilities as prescribed in the Landfill Directive.

The HazWasteOnline (HWOL) outputs are attached in Appendix C of the OCSC (2020) Waste Soil Classification report for the site contained in Appendix C Volume III of this EIAR.

The table below summarises the waste classification assessment of soil analytical results from the 2020 soil investigation on the site.

Table 17.2 – Soil Classification Results

	A	B1	B2	C1	C2	D	D1
	Inert – Waste Permitted or Recovery Sites	Inert e.g. IMS B1	Inert e.g. IMS Landfill Inc. Limits	Non-Haz	Non-Haz Quantifiable asbestos	Hazardous	Hazardous with Asbestos >0.1%
No. of samples	11	98	30	26	1	16	1

A total of 11No. samples have been identified as category A inert, 98No. samples as category B1 inert (IMS B1), 30No. samples as category B2 inert (IMS B2), 26No. samples as C1 Non-Haz, 1No. samples C2 Non-Haz with quantifiable asbestos, 16No. samples as D Hazardous and 1No. sample D1 Hazardous with asbestos >0.1%.

Site investigations have not been conducted to determine contaminants levels within the watermain upgrade area. Excavated material from these works will require stockpiling on site under controlled conditions as detailed in the CEMP. The materials will then be sampled and sent for laboratory analysis to determine the appropriate disposal option(s) for these materials.

The undertaking of disposal of soils from the development and watermains upgrade sites in compliance with the CEMP and the Waste Management Act will mitigate potential risks associated with these activities such that the

impact associated with these works will be positive, permanent, and significant due to the removal of contamination source material.

17.6.2.4 Sources of Fill and Aggregates

The use of fill and aggregate containing recycled or recovered materials shall be considered. All imported fill and aggregate for the project will be sourced from reputable suppliers as per the project Contract and Procurement Procedures. All suppliers will be vetted for:

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

The undertaking of procurement and fill and aggregates in compliance with the CEMP will mitigate potential risks associated with these activities such that the impact associated with these works will be neutral, temporary to short-term, and not significant

17.6.2.5 Fuel and Chemical Handling

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

- Designation of bunded refuelling areas on the site (if required);
- Provision of spill kit facilities across the site;
- Where mobile fuel bowzers are used, the following measures will be taken:
 - Any flexible pipe, pump, tap, or valve will be fitted with a lock and will be secured when not in use;
 - All bowser units will carry a spill kit and operatives must have spill response training; and
 - Portable generators or similar static operation fuel containing equipment will be placed on suitable drip trays.

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

- Secure storage of all containers that contain potential polluting substances in a dedicated, internally bunded chemical storage cabinet unit or inside concrete bunded areas;
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the site, they should be done so secured and on spill pallets; and
- Drums to be loaded and unloaded by competent and trained personnel using appropriate equipment.
- Refuelling and servicing of construction machinery to take place in a designated hardstanding area remote from surface water inlets (when it is not possible to carry out such activities off-site).
- Good housekeeping (site clean-ups, use of disposal bins, etc.) on the site.

The aforementioned list of measures is non-exhaustive and is included in the CEMP. The handling of fuel and chemicals on the development and watermains upgrade sites in compliance with the CEMP will mitigate potential risks associated with these activities such that the impact associated with these works will be negative, temporary to short-term, and slight.

17.6.2.6 Control of Water During Construction

Run-off from excavations/earthworks cannot be prevented entirely and is largely a function of the prevailing weather conditions. Earthwork operations will be carried out such that surfaces, as they are being raised, shall be designed with adequate drainage, falls and profile to control run-off and prevent ponding and flowing. Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. All run-off will be prevented from directly entering any water courses.

During construction, groundwater ingress into the excavations is possible, and a discharge licence will likely be required to enable discharge of water to the public sewer to keep the excavation dry. Should any discharge of

construction water be required during the construction phase, discharge to foul sewer will be regulated under a Discharge Licence obtained from the Regulator (Irish Water) and issued under the Water Pollution Act. Attenuation, pre-treatment, and monitoring of discharge water will likely be required under any Discharge Licence (Section 16 Licence). Pre-treatment and silt reduction measures on site will include a combination of silt fencing, settlement measures (silt traps, silt sacks, and settlement tanks), surface water inlet protection, earth bunding adjacent to open drainage ditches, and hydrocarbon interceptors. Active treatment systems such as Siltbusters or similar may be required depending on turbidity levels and discharge limits. Qualitative and quantitative monitoring will be implemented as per the Conditions of any Discharge Licence. The client's environmental consultant will audit the sampling and analysis results as required to ensure conformance to the discharge licence limits and testing frequency requirements.

The control of water during construction on the sites in compliance with the CEMP and any required Discharge Licence will mitigate potential risks such that the impact associated with this phase of works will be neutral, temporary to short-term, and not significant to slight.

17.6.3 Operational Phase Mitigation

Mitigation measures envisaged during the operational phase comprise;

- Ensuring regular maintenance of site services, SuDS features, and attenuation systems such that they operate as designed.
- Emptying oil separators as per manufacturer's operation and maintenance recommendations to mitigate against risk of spillage / leaks into the soils.

During the operational phase of the development, there will be no requirement for fuel oil storage thus removing any potential source of contamination and resultant mitigation requirements. There are no proposals to connect to the gas supply to serve the development as the development will be heated by air source heat pumps. As such, the potential impact following mitigation associated with the operational phase will be neutral, permanent, and not significant.

This section describes monitoring measures to be implemented to ensure that site construction and operational phases of the proposed development to not pose any potential adverse geological impact to the site or surrounding area.

17.6.4 Construction Phase Monitoring

Construction phase monitoring relates to the good maintenance of mitigation measures outlined above in section 5.8, including the CEMP contained in Appendix B Volume III of this EIAR. Proposed monitoring during the construction phase in relation to the soil and geological environment includes:

- Soil removed during the construction phase is to be monitored to maximise potential for re-use on site. Any contaminated soil encountered and not identified on site investigations will be analysed and disposed off-site at a suitable licensed facility.
- The quantities of topsoil, subsoil and rock removed off site will be recorded.
- Record keeping and monitoring of import and export of soils shall be carried out in accordance with the Waste Management Act. All waste haulers and receiving facilities shall have valid permits in accordance with the Waste Management Acts and Planning Conditions.
- Monitoring of any hazardous material stored on site forms part of the Construction & Demolition Waste and By-Product Management Plan, included in the application and Chapter 11 of this EIAR Material Assets Waste Management.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill; protection of soils from contamination for removal from site)
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection, etc.)
- Monitoring shall be carried out as per the conditions of any water Discharge Licence associated with the construction phase of the project.
- Monitoring of dust and noise shall also be carried out as specified in the planning permission should the development be allowed to proceed.
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road sub-formation level in advance of placing capping material, stability of excavations etc.).

- Inspection of fuel / oil storage areas.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities.

17.6.5 Operational Phase Monitoring

There is no requirement for monitoring during the operational phase except for that associated with the regular maintenance of site services, SuDS features, and attenuation systems such as oil separators.

17.7 WATER, HYDROLOGY, HYDROGEOLOGY

17.7.1 Incorporated Design Mitigation

Surface water runoff from the proposed development will be managed in accordance with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS), with surface water attenuation and retention included as part of the main surface water drainage system.

Many design mitigation measures has been incorporated into the proposed development's surface water management system. Typically, all rainfall runoff is to be managed by an integrated sustainable drainage network, which utilises various sustainable drainage systems and landscaping features to treat rainfall runoff at source, and intercept the initial rainfall flush. This ensures a higher quality of surface water, and lower total volume of surface water, discharging from site. The design mitigation measures include:

- Green roofs;
- Pervious paving car parks;
- Bio-retention zones;
- Filter drains;
- Integrated SuDS tree pits;
- Interception zones under attenuation;
- Silt traps;
- Flow controls;
- Deep landscaping features.

17.7.2 Construction Phase Mitigation

This stage of the development will be dealt with by the appointed contractor through the development and implementation of a Construction & Environmental Management Plan submitted under separate cover with this application. This plan will be agreed with the Local Authority prior to the commencement of construction.

Surface water on site will likely be required to be passed through settlement tanks and similar, with controlled discharge to the public network. This will be subject to approval of a construction discharge license from Dublin City Council.

Standard best practice measures including CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, (C532) will be applied to minimise potential impacts on surface water hydrology and groundwater. These include the following; potentially contaminating liquids in the on-site buildings including oil storage tanks, boilers, chemicals and cleaning agents will be removed from the site and disposed in accordance with the requirements of the Outline Construction Environmental Management Plan (CEMP), prepared by OCSC Consulting Engineers, which is included under separate cover with this application.

All construction and demolition plant will be regularly checked to ensure there are no leaks or drips of oils to ground. Plant maintenance will not be undertaken on site. All fuel oils for plant will be stored in bunded storage areas in the site compound.

All construction materials with the potential to impact on water will be stored in secure bunded areas in the construction compound or at designated storage areas on the construction site footprint. Drip trays will be provided for drum storage.

All waste containers (including all ancillary equipment such as vent pipes and refuelling hoses) will be stored within a secondary containment system. Excavation and the stripping of soils will not be undertaken until absolutely necessary to prevent sediment run off and leaching of nutrients from soils into drains or to groundwater.

All potentially contaminating liquids in the existing site buildings, including oil storage tanks, boilers, chemicals and cleaning agents will be removed from the site and disposed in accordance with the requirements of the Construction Environmental Management Plan submitted under separate cover.

Excavated soils will be stockpiled to minimise the effects of weathering. Care will be taken in re-working this material to minimise dust generation, groundwater infiltration and generation of runoff. The following mitigation measures will be used to control the interaction of wash down water from concrete and cementitious material with water:

All batching and mixing activities will be located in contained areas

Pouring of cementitious materials will be carried out where possible in dry weather conditions;

- Pumped concrete will be monitored to ensure no accidental discharge;
- Excess concrete will not be discharged to ground;
- There will be no hosing into the ground surface of spills of concrete, cement, grout or similar materials;
- Washout from mixing plant or concrete trucks will not be permitted on the site.

The Contractor will be required to prepare and implement a Surface Water Management Plan that ensures avoidance and minimisation of effects. Surface water storage in excavations may be directed to on-site settlement ponds, where silt removal will be facilitated prior to discharge off site at a controlled rate. Periodic testing of the surface water discharge may also be undertaken.

If concrete mixing is carried out on site, the mixing plant will be sited in a designated area with an impervious surface. To minimise any impact on the water environment from material spillages, all oils, solvents, and paints used during construction will be stored within temporary bunded areas or chemical storage containers.

17.7.3 Operational Phase

Surface water runoff from the proposed development will be managed in accordance with the requirements of the Greater Dublin Strategic Drainage Study (GSDS), with surface water attenuation and retention included as part of the main surface water drainage system.

The surface water management proposals will reduce the overall adverse effects of the subject site on the existing environment by adopting a SuDS approach by combining elements such as blue roofs, bio-retention areas, attenuation storage and flow control.

The proposed drainage system will be commissioned and subject to a regular operational inspection and maintenance regime to ensure the system keeps operating within the design specifications.

The design mitigation measures outlined in 6.6.1 shall minimise the volume of rainfall runoff discharging from site to the river Camac, and reduce the flow rate to greenfield equivalent; thus, reducing the flood risk downstream. The integrated sustainable drainage system will also act to capture silt, solids and debris, along with hydrocarbons, which will result in a higher quality of surface water discharging from site.

The above will ensure that the receiving environment i.e., the river Camac, will likely have a significant positive impact, with permanent effects.

17.7.4 Monitoring

The requirement and recommendation for monitoring related to the hydrological environment is as follows:

- Qualitative and quantitative monitoring of any water to be discharged to the local infrastructure during the construction and operation phases. This might include flow monitoring and a regular sampling and analysis programme, if required by the Regulating Authority under any Discharge Licence.
- Watching Brief and Discovery Strategy for any potentially contaminated material to ensure adequate classification and disposal (refer to Chapter 8 of Vol. II of this EIA, Land and Soils);

- Regular inspection of on-site fuel storage facilities to ensure environmental ‘best-practices’ are being employed during construction;
- Upon installation of new drains, pressure tests will be carried out to assess the potential for leaks to occur in the newly constructed drains; and
- Following completion of the proposed drainage systems, a short-term flow and rainfall survey (involving in-pipe flow monitors and rain gauges on site) will be carried out to identify misconnections and allow for comparison with watermain meter readings to facilitate assessment and identification of any leakages.
- Regular inspection of maintenance of landscaping and sustainable drainage systems to ensure they are well maintained and remain functioning as per design.

17.8 AIR QUALITY AND CLIMATE

This section provides the measures that shall be implemented during the construction and operational phases of the development and into the design of the development to minimise the impacts/effects on ambient air quality in the receiving environment, on local population and human health, on local flora and fauna and on climate.

17.8.1 Demolition Phase

Pending the results of an asbestos survey of the Part 8 buildings to be demolished at the development site, a licensed asbestos contractor shall be appointed to remove all asbestos containing materials (ACM's) in accordance with the Health and Safety Authority's Guidelines on ACM Management and Abatement.

Demolition activities including concrete breaking shall include the use of water suppression techniques to minimise the generation of dust.

17.8.2 Construction Phase

- Use of rubble chutes and receptor skips during construction activities.
- During dry periods, dust emissions from heavily trafficked locations (on and off site) will be controlled by spraying surfaces with water and wetting agents.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic only.
- Re-suspension in the air of spillages material from trucks entering or leaving the site will be prevented by limiting the speed of vehicles within the site to 10kmh and by use of a mechanical road sweeper.
- The overloading of tipper trucks exiting the site will not be permitted.
- Aggregates will be transported to and from the site in covered trucks.
- Where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser.
- Wetting agents shall be utilised to provide a more effective surface wetting procedure.
- Exhaust emissions from vehicles operating within the construction site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, rather than just following breakdowns; the positioning of exhausts at a height to ensure adequate local dispersal of emissions, the avoidance of engines running unnecessarily and the use of low emission fuels.
- All plant not in operation shall be turned off and idling engines shall not be permitted for excessive periods.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- Material stockpiles containing fine or dusty elements including top soils shall be covered with tarpaulins.
- Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used to prevent unnecessary dust emissions by the erection of wind breaks or barriers. All concrete cutting equipment shall be fitted with a water dampening system.
- A programme of air quality monitoring shall be implemented at the site boundaries for the duration of construction phase activities to ensure that the air quality standards relating to dust deposition and PM10 are not exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented.
- A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.

- Dust netting and site hoarding shall be installed along the north, south, east and western site boundaries to minimise the propagation of fugitive windblown dust emissions falling on third party lands and existing residential areas.

17.8.3 Operational Phase

The Operational Phase of the Emmet Road mixed use development will not generate air emissions that would have an adverse impact on local ambient air quality or local human health.

The operational phase includes mitigation by design of the development to minimise the impact of the operational phase of the development on air quality and climate are as follows:

AC-O1 Climate Impact Mitigation Measures by Design

- Energy Efficiency – All residential units shall be designed and constructed in accordance with The Irish Building Regulations Technical Guidance Document L – Conservation of Fuel & Energy – Dwellings amended in 2017 includes requirements for all residential dwellings to be “Nearly Zero Energy Buildings” (NZEB’s) by 31st December 2020.
- Energy Consumption - The following key design features have been integrated into the design and construction of the residential units to reduce energy consumption:
 - Photovoltaic Cells will be installed on all roofs
 - The use of green building materials: low embodied energy & recycled materials will be utilised where possible
 - Energy efficient window units and frames with certified thermal performance shall be used
 - Building envelope air tightness will reduce the loss of warm air to the external environment
 - Installation of Exhaust Air Heat Pump systems in all units which operate by extracting warm air from kitchens and bathrooms, cleaning it and distributing it to other rooms in the unit.
 - Thermal insulation of walls and roof voids of all units

AC-O2 Air Quality Mitigation Measures

- A centralised air source heat pump is proposed to provide the heating load to the development.
- Inclusion of electric car charging points to encourage electric vehicle ownership
- There will be reduced car-parking at the development site given the quality of and proximity to Public designed for walking and cycling and the provision of a mobility hub.
- Provision of open landscaped areas, to encourage residents to avail of active lifestyle options and which will contribute albeit in a minor way to the adsorption of Carbon Dioxide from the atmosphere and the release of Oxygen into the atmosphere.

17.8.4 Monitoring

17.8.4.1 Construction Phase

This section describes the dust monitoring methodologies that shall be implemented at the site during the construction phases to ensure that dust and particulate matter (PM10 and PM2.5) generated by site activities does not cause nuisance or cause adverse health effects to residential areas and other receptors located in the vicinity of the site boundaries.

Dust Deposition Monitoring Methodology

Dust deposition levels will be monitored to assess the impact that site construction site activities may have on the local ambient air quality and to demonstrate that the environmental control measures in place at the site are effective in minimising the impact of construction site activities on the local receiving environment including existing residential developments and lands bordering the site. The following procedure will be implemented at the site on commencement of site activities:

The dust deposition rate will be measured by positioning Bergerhoff Dust Deposit Gauges at strategic locations near the boundaries of the site for a period of 30 +/-2 days. Monitoring shall be conducted on a monthly basis during the construction phase. The proposed monitoring locations (D1 – D4) are presented below.

The selection of sampling point locations will be completed after consideration of the requirements of Method VDI 2119 with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures. The optimum locations will be determined by a suitably qualified air quality expert to ensure that the dust gauge locations are positioned in order to best determine potential dust deposition in the vicinity of the site boundaries and existing on-site buildings.

After each (30 +/-2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in mg/m²-day in accordance with the relevant standards.

Technical monitoring reports detailing all measurement results, methodologies and assessment of results shall be subsequently prepared and maintained by the Site Manager. Monitoring reports shall be made available to the Local Authority as requested.

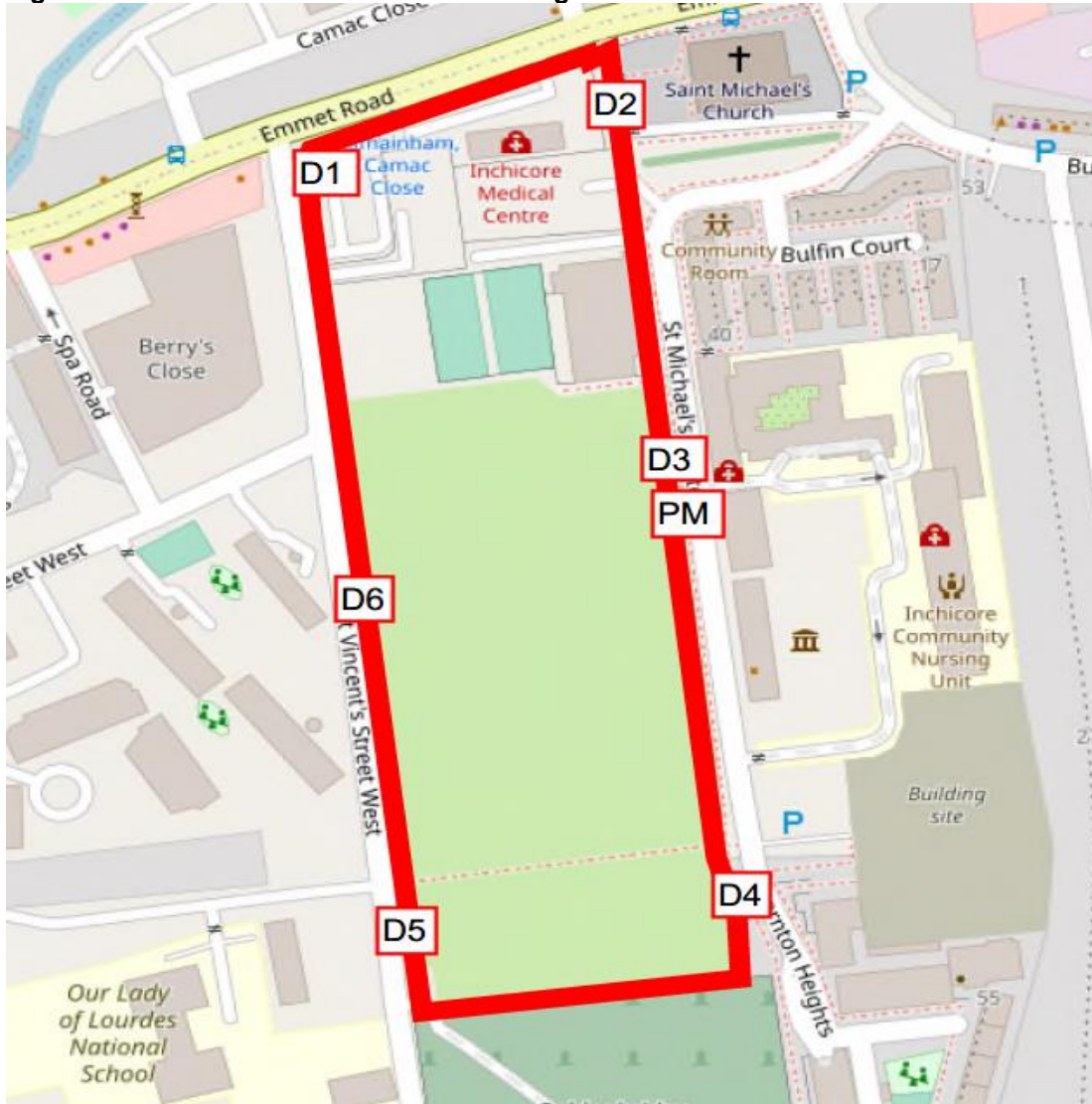
A dust deposition limit value of 350 mg/m²-day (measured as per German Standard Method VDI 2119 – Measurement of Particulate Precipitations – Determination of Dust Precipitation with Collecting Pots Made of Glass (Bergerhoff Method) or Plastic. is commonly specified by Local Authorities and by the EPA to ensure that no nuisance effects will result from specified activities and it is to this Best Practice standard method that this programme of dust monitoring and control has been prepared.

The German Federal Government Technical Instructions on Air Quality Control - TA Luft specifies an emission value for the protection against significant nuisances or significant disadvantages due to dustfall. This limit value is 350 mg/m²-day and it is to this limit value that all measured dust deposition levels shall be assessed. This limit value is commonly specified by Local Authorities at construction sites.

PM10 & PM2.5 Monitoring Methodology

Fine particulate matter as PM10 and PM2.5 shall be monitored using continuous data logging air quality monitoring instrumentation during the stripping and excavation of soils at the site. The monitoring system shall be located at the eastern site boundary at location PM as shown below.

Figure 17.1 – Construction Phase Monitoring Locations



17.8.4.2 Operational Phase

Air quality monitoring is not required for the operational phase of the proposed development.

17.9 NOISE AND VIBRATION

17.9.1 General Construction Site Management

The following noise management measures shall be implemented at the site from the outset of site activities to control and manage noise levels during the construction phase of the proposed development:

NV CONST 1 Construction Management Noise Mitigation

An independent acoustic consultant will be engaged by the contractor prior to the commencement of site activities to ensure that all noise mitigation measures as specified in this Chapter of the EIAR are implemented and to prepare a site-specific Construction Phase Noise Management Plan. The Plan will include all relevant noise and vibration control measures as specified in this Chapter of the EIAR. The Plan will be submitted to Dublin City Council for approval prior to the commencement of site works.

The nominated contractor shall appoint a designated person to manage all environmental complaints including noise and vibration.

A noise complaint procedure shall be implemented in which the details of any noise related complaint are logged, investigated and where required; measures are taken to ameliorate the source of the noise complaint.

In the event of the requirement for out of hours work to occur which will involve the generation of noise levels that are predicted to exceed out of hours noise limit criteria, Dublin City Council shall be notified no less than 72-hours prior to the works commencing.

Appropriate signage shall be erected on all access roads in the vicinity of the site to inform HGV drivers that engines shall not be left idling for prolonged periods and that the use of horns shall be banned at all times.

All site staff and contractors will be made aware of the requirement to implement noise mitigation measures to reduce the impact of all construction activities on the adjacent noise sensitive receptors by tool-box talks and via signage that shall be posted throughout the site.

Should noise limits be exceeded, site management will immediately investigate the source of the activity generating the noise and ensure that it is controlled to prevent a repeat exceedance.

Site offices will be stacked to act as a noise barrier to minimise the propagation of site noise.

The high site hoarding with a minimum height of 4m shall be erected around the entire site boundary to reduce the propagation of noise from the site to adjacent noise sensitive receptors.

Mains power will be used to supply electricity to all site offices and site lighting.

17.9.2 Construction Phase Noise Control & Mitigation

The following will be implemented to mitigate construction noise impacts in order to ensure that the construction phase of the development does not have an unacceptable impact on local noise sensitive receptors:

NV CONST 2 Construction Works Noise Mitigation Measures

- A strictly enforced noise management plan will be implemented at the site from the outset of construction activities and will include the mitigation measures contained in this EIAR.
- The principle of controlling noise at source will be implemented at the site. Best practice mitigation techniques as specified in BS 5228:2009+A1 2014 – Noise and Vibration Control on Construction and Open Sites will be implemented during the construction phase and are detailed in this Section.
- Generators will not operate when the site is closed during the nighttime and during weekends.
- Mains power and transformers will be used instead of generators where possible
- Where generators are required, only super silenced models shall be used.
- Mobile compressors shall be enclosed by acoustic screens.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and will be maintained in good efficient order
- All high noise activities including but not limited to, concrete cutting, steel cutting, pneumatic breaking shall be conducted using acoustic screens to minimise the propagation of noise and minimise the reverberation of the noise from the activity.
- All site vehicles shall be fitted with broadband non-tonal reverse alarms
- All pneumatic percussive tools such as pneumatic hammers shall be fitted with dampers, mufflers or silencers of the type recommended by the manufacturer.

- Any plant, equipment or items fitted with noise control equipment found to be defective in shall not be operated until repaired / replaced.
- Site vehicles and items of plant in intermittent use shall be shut down in the intervening periods between works or throttled down to a minimum during periods when not in use.
- All excavator mounted pneumatic breakers used for demolition and ground breaking activities shall be fitted with effective dampeners and /or enclosed within a noise adsorbing blanket structure to minimise the propagation of noise
- All drivers of excavators and material movement vehicles shall be instructed to minimise drop heights at all times. Signage to this effect shall be posted throughout the site.
- The dragging of materials such as steel covers, plant or excavated materials along ground surfaces shall not be permitted.

The images below describe the use of typical localised acoustic screens that shall be used during construction activities.

Double height acoustic blanket enclosure



Acoustic blankets screening excavations



3 sided Acoustic enclosure



Acoustic Blankets



17.9.3 Construction Phase Vibration Control & Mitigation

The following specific vibration mitigation and control measures shall be implemented during the construction phase:

NV CONST 3 Vibration Mitigation Measures

- Choosing alternative, lower-impact equipment or methods wherever possible
- Routing, operating or locating high vibration sources as far away from sensitive areas as possible
- Sequencing operations so that vibration causing activities do not occur simultaneously
- Isolating the equipment causing the vibration on resilient mounts
- Keeping equipment well maintained.
- Confining vibration-generating operations to the least vibration-sensitive part of the day which could be when the background disturbance is highest
- A nominated person from the Project Management team will be appointed to liaise with local residents and businesses regarding vibrational nuisance events.
- In order to ensure that site construction activities are conducted to minimise the vibration impacts on the receiving environment, structural vibration monitoring shall be conducted during the course of the construction phase,

N V CONST 4

In order to protect the amenities enjoyed by nearby residents and premises a full Construction and Environmental Management Plan (CEMP) (including traffic management) shall be included in the application documentation. The CEMP will include the mitigation measures set out in this section of the EIAR.

17.10 MONITORING

17.10.1 Construction Phase Noise & Vibration Monitoring

17.10.1.1 Noise Monitoring

Prior to the commencement of the site construction activities, a programme of continuous noise monitoring at the closest receptors to the site shall be undertaken to assess and manage the impact that site activities may have on ambient noise levels at receptors. These surveys will establish the noise impact of site activities at the closest noise sensitive receptors to assess compliance with the specified construction noise limit criteria and to ensure that mitigation and control measures are being implemented as required.

All noise monitoring data will be compiled into a monthly technical monitoring report which will include a full assessment of the potential noise impacts arising from site construction activities.

The environmental noise measurements will be completed in accordance with the requirements of ISO 1996-1: 2017: Acoustics – Description, measurement and assessment of environmental noise and with regard to the EPA's 2016 Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4). The measurement parameters to be recorded include LAeq, LA90, LA10 and LAm_{ax}, and 1/3 Octave Frequency analysis to allow tonal noise to be identified.

All live noise monitoring systems shall be programmed to include audio recording to allow construction management identify the source of high noise. The systems shall be capable of transmitting live text and email alerts to nominated construction staff should a noise limit be approached or exceeded.

Noise monitoring shall be conducted in proximity to the closest noise sensitive receptors to the site. The noise monitoring locations (N) in proximity to the closest receptors are shown below.

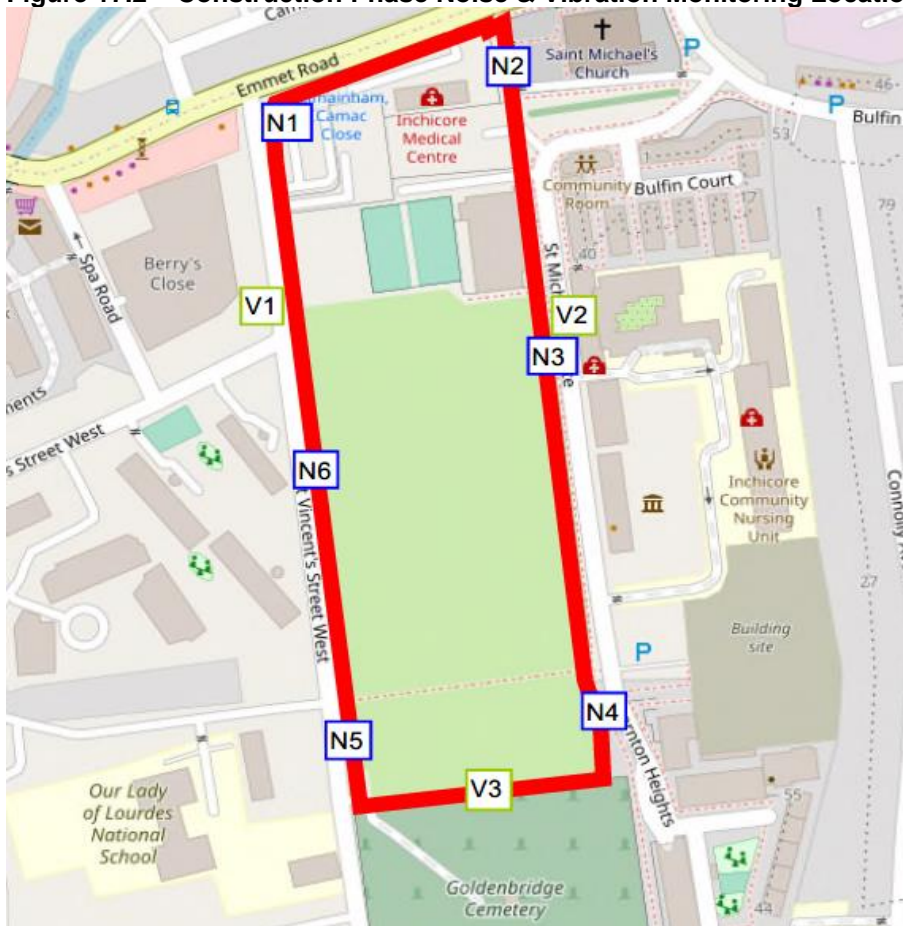
17.10.1.2 Vibration Monitoring

In order to ensure that site construction activities are conducted to minimise the vibration impacts on the receiving environment, it is proposed that structural vibration monitoring shall be implemented during the course of the construction phase. It is proposed that vibration monitoring will be conducted at the closest adjacent properties to the site boundaries using live data logging vibration monitors and geophones with live text and email alert functionality to ensure that if vibration levels approach or exceed the specified warning and limit values, nominated construction staff shall be instantly alerted to cease at the earliest instance and appropriate mitigation measures may then be implemented to minimise the ongoing impact on the monitored structures.

The monitoring points chosen for locating the geophone of the vibration measuring instrument will be determined according to the guidelines in British Standard BS 7385: Evaluation and measurement for vibration in buildings, Part 1 1990 Guide for measurement of vibrations and evaluation of their effects on buildings and Part 2 1993 Guide to damage levels arising from ground borne vibration.

The vibration monitoring locations (V) in proximity to the closest receptors are shown below.

Figure 17.2 – Construction Phase Noise & Vibration Monitoring Locations



17.10.2 Operational Phase Monitoring

Monitoring is not required during the operational phase.

17.11 LANDSCAPE AND VISUAL

17.11.1 Construction Phase

No measures are recommended for townscape and visual impact mitigation other than standard best practice construction site management.

17.11.2 Operational Phase

The potential townscape and visual effects of the proposal in the operational phase have been classified as positive or neutral. No negative effects have been identified. Therefore no mitigation measures are required for townscape and visual effects.

17.11.3 Monitoring

No monitoring of townscape and visual effects is required other than the monitoring of soft landscape works after planting to ensure the health and viability of the plants.

17.12 MATERIAL ASSETS – TRAFFIC AND TRANSPORTATION

17.12.1 Construction phase

A Construction and Environmental Management Plan (CEMP) accompanies this application and sets out the measures to mitigate the impact on the local environment during the construction phase. A Construction Traffic Management Plan (CTMP) based on the CEMP will be developed by the appointed contractor and submitted to An Bord Pleanála for approval prior to commencement of work. It will implement the relevant Mitigation Measures in this EIAR including the CEMP accompanying this planning application (contained in Appendix B Volume III of this EIAR.

A number of measures are proposed for the construction stage and will include:

- Limited on-site parking will be provided to encourage staff to travel by more sustainable means including public transport and/or car sharing, particularly given the proximity of the Luas station and bus services to the development site;
- Adequate on-site compounding will be provided to prevent any potential overflow onto the local transport network;
- The potential for construction staff to be brought to the site in vans/minibuses and other similar mobility management measures to limit trip generation will be investigated;
- Delivery vehicles travelling to and from the site can be controlled to a degree and so will be spread across the course of the working day meaning the number of HGV's travelling during the peak hours will be relatively low.

Further mitigation measures are outlined for the Construction Stage as set out in the Construction and Environmental Management Plan included in support of this application which includes details such as:

- Hoarding & site security;
- Site compound;
- Site access & egress;
- Site deliveries;
- Storage of materials;
- Removal of materials from site;
- Hours of Work;
- Public relations & Community Liaison;
- Environmental management
- Dust, dirt, noise and vibration management;
- Management of harmful materials
- Construction traffic management;

17.12.1.2 Operational phase

Mitigation measures for the operational stage have primarily been incorporated into the development design, with further plans set out to support these measures.

The key design mitigation measures are:

- Reduction in provision of private car parking spaces to reduce the level of car ownership at the site and the associated potential for unnecessary car based trips generated by the development;
- Provision of an extensive number of car club spaces across the site to facilitate occasional and necessary travel by car but not practical for commuting purposes;
- Provision of varied and high quality cycle parking options throughout the development site including cargo bike spaces which can facilitate an increased number of trips by bicycle;
- A high degree of permeability through the site to the benefit of residents and users, providing connectivity to local amenities and public transport options as well as through movements.

The supporting mitigation measures include:

- Implementation of a site specific Mobility Management Plan to facilitate and encourage travel by sustainable and active modes, thereby reducing car based travel;
- Implementation of a site specific Car Parking Strategy to facilitate the reduced car ownership at the site as outlined in the Traffic & Transport Assessment and summarised earlier in this chapter.

17.12.2 Monitoring

The construction phase will be monitored by the appointed site manager and regular progress reports will be prepared. The manager will ensure the mitigation measures outlined will be implemented and adhered to.

A mobility manager will be appointed from within the management company to ensure the implementation of the Mobility Management Plan. They will also be responsible for the undertaking of post occupation travel surveys and act as a point of contact for residents for all mobility and access related issues.

The Management Company will be responsible for the continued implementation of the site specific parking strategy to ensure effective communication and control is ongoing.

17.13 MATERIAL ASSETS – WASTE MANAGEMENT

The following measures will mitigate the impact of the construction and operational phases impact on regional waste management infrastructure.

17.13.1 Construction Phase Resource and Waste Management Plan

The Resource and Waste Management Plan (RWMP) prepared by Byrne Environmental (included with the application in Appendix D Volume III of the EIAR) specifically addresses the following aspects:

Waste materials generated by construction activities will be managed according to the EPA Draft Best Practice Guidelines for the preparation of resource management plans for construction and demolition projects, April 2021. The mitigation measures contained in the CWMP will be implemented in full and form part of the mitigation strategy for the site.

- Analysis of waste arisings / material surpluses;
- Specific Waste Management objectives for the Project including the potential to re-use existing on-site materials for further use in the construction phase;
- Methods proposed for Prevention, Reuse and Recycling;
- Waste Handling Procedures;
- Waste Storage Procedures;
- Waste Disposal Procedures;
- Record Keeping.

Waste minimisation and prevention will be the primary responsibility of the Resource and Waste Manager who shall ensure the following:

- Materials will be ordered on an “*as needed*” basis to prevent over supply;
- Materials will be correctly stored and handled to minimise the generation of damaged materials;

- Materials will be ordered in appropriate sequence to minimise materials stored on site;
- Sub-contractors will be responsible for similarly managing their wastes.

17.13.2 Programme of Waste Management for Construction Works

It is proposed that the construction Contractor as part of regular site inspection audits will determine the effectiveness of the waste management statement and will assist the project manager in determining the best methods for waste minimisation, reduction, re-use, recycling and disposal as the construction phase progresses and waste materials are generated.

17.13.3 Construction Waste Disposal Management

It is proposed that from the outset of construction activities, a dedicated and secure compound containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the active construction phase of the development site.

In order to ensure that the construction contractor correctly segregate waste materials, it is the responsibility of the site construction manager to ensure all staff are informed by means of clear signage and verbal instruction and made responsible for ensuring site housekeeping and the proper segregation of construction waste materials.

It will be the responsibility of the Resource and Waste Manager to ensure that a written record of all quantities and natures of wastes exported -off site are maintained on-site in a Waste File at the Project office.

It is the responsibility of the Resource and Waste Manager that all contracted waste haulage drivers hold an appropriate Waste Collection Permit for the transport of waste loads and that all waste materials are delivered to an appropriately licenced or permitted waste facility in compliance with the following relevant Regulations:

- *Waste Management (Collection Permit) Regulations 2007 (SI No. 820 of 2007);*
- *Waste Management (Collection Permit) Amendment Regulations 2008 (SI No. 87 of 2008);*
- *Waste Management (Facility Permit and Registration) Regulations S.I.821 of 2007 and the Waste Facility Permit under the Waste Management (Facility Permit and Registration) Amendment Regulations S.I.86 of 2008.*

Prior to the commencement of the Project, the Resource and Waste Manager shall identify a permitted Waste Contractor who shall be employed to collect and dispose of all wastes arising from the project works. In addition, the Resource and Waste Manager shall identify and all waste licensed / permitted facilities that will accept all expected waste exported off-site and will maintain copies of all relevant Waste Permits / Licences as required.

All waste soils prior to being exported off-site, have been classified utilising HazWasteOnline software using classification engine WM3.v1.1. Excess soils shall be exported off-site to appropriately permitted/licenced facilities based on their acceptance criteria.

17.13.4 On-Site Waste Reuse and Recycling Management

Construction waste material such as soils, damaged or broken concrete slabs, blocks, bricks and tiles generated that is deemed by the Project Engineer to be suitable for reuse on the Project site for ground-fill material and landscaping. This initiative shall provide a positive environmental impact to the construction phase as follows:

- Reduction in the requirement for virgin aggregate materials from quarries;
- Reduction in energy required to extract, process and transport virgin aggregates;
- Reduced HGV movements associated with the delivery of imported aggregates to the site;
- Reduced noise levels associated with reduced HGV movements;
- Reduction in the amount of landfill space required to accept C&D waste;
- Reduction in the volume of soils to be exported off-site.

17.13.5 Waste Storage Compound

A waste storage compound shall be set up on-site from the commencement of site activities. The compound shall include the following:

- Separate waste skips labelled with signage stating the nature of waste materials that can only be placed in the skips;
- Waste oils / containers shall be placed in dedicated mobile bunds units;
- Soils contaminated by accidental on-site spillages of oils / construction hydrocarbons shall be stored in clearly identified hazardous waste storage containers;
- Spill kits with instructions shall be located in the waste storage compound.

17.13.6 Soil Classification

Soils at the site have been classified by *O'Connor Sutton Cronin (Report Dated Jan 2021)* following sampling, analysis and the utilisation of the *HazWasteOnline software WM3V.1.1*.

Table 17.3 – Soil Classification Results

	A	B1	B2	C1	C2	D	D1
	Inert – Waste Permitted or Recovery Sites	Inert e.g. IMS B1	Inert e.g. IMS Landfill Inc. Limits	Non-Haz	Non-Haz Quantifiable asbestos	Hazardous	Hazardous with Asbestos >0.1%
No. of samples	11	98	30	26	1	16	1

17.13.7 Invasive Species listed on the Third Schedule of S.I. 477/2011 (as amended)

An ecological assessment of the site prepared by Enviroguide has identified the presence of Buddleia plant species on the subject site. The management of the species shall be managed by cutting Buddleia plants to a basal stump during active growth (late spring to early summer) and immediately treating the total cut surface with herbicide concentrate. Monitoring will be required and retreatment, as necessary.

17.13.8 Top-Soil Reuse

Approximately 35,289m³ of soils shall be stripped to facilitate the construction phase. Topsoil shall be retained on-site and shall be re-used for landscaping purposes.

17.13.9 Record Keeping

It is the responsibility of the Project Manager or his/her delegate that a written record of all quantities and natures of all wastes reused / recycled and exported off-site during the construction phase are maintained in a Waste File at the site project office.

The following information shall be recorded for each load of waste exported off-site:

- Waste Type EWC Code and description;
- Volume of waste collected;
- Waste collection contractor's Waste Collection Permit Number and collection receipt including vehicle registration number;
- Destination of waste load including Waste Permit / Licence number of facility;
- Description of how waste at facility shall be treated: disposal / recovery / export;
- The waste records shall be issued to Dublin City Council as required / requested.

17.13.10 Waste Management Auditing

In order to ensure that construction wastes generated during the course of the development are being effectively managed and recorded, a waste management audit shall be conducted on a routine basis by an independent waste management consultant to determine compliance with the Resource Waste Management Plan.

17.13.11 Operational Phase Waste Management Plan

An Operational Waste Management Plan (OWMP) has been prepared as a stand-alone report to accompany the Part 10 application and is contained in Appendix D Volume III of the EIAR. The mitigation measures contained in the OWMP will be implemented in full and form part of the mitigation strategy for the site. The OWMP has been prepared to demonstrate how the required infrastructure will be incorporated into the design and operational management of the development to ensure that domestic wastes will be managed and monitored with the objective of maximising the quantity of waste segregated at source and maximising the volume of clean recyclable materials generated by the residents of the development.

The Goal of the OWMP is to achieve a compliance with the current *Eastern-Midlands Region Waste Management Plan* which defines the following Waste Targets:

- 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan.
- Achieve a recycling rate of 50% of managed municipal waste .
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill.

The Operational Waste Management Plan has been prepared with regard to the strategy, policy and objectives and design standards of the Draft Dublin City Council Development Plan 2022-2028.

The Operational Waste Management Plan is defined by the following stages of waste management for both the residential and commercial aspects of the development:

- Stage 1 Occupier Source Segregation;
- Stage 2 Occupier Deposit and Storage;
- Stage 3 Bulk Storage and On-Site Management;
- Stage 4 On-site treatment and Off-Site Removal;
- Stage 5 End Destination of wastes.

The OWMP has been prepared with regard to *British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice* which provides guidance on methods of storage, collection, segregation for recycling and recovery for residential building.

The apartments which will include a 3 - bin waste segregation at source system together with the communal waste storage areas have been designed with regard to *Section's 4.8 and 4.9 Refuse Storage of The Department of Housing, Planning and Local Government – Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities. 2020.*

The proposed residential development shall be designed and managed to provide residents with the required waste management infrastructure to minimise the generation of un-segregated domestic waste and maximise the potential for segregating and recycling domestic waste fractions.

The **Objective** of the OWMP is to maximise the quantity of waste recycled by residents by providing sufficient waste recycling infrastructure, waste reduction initiatives and waste collection and waste management information services to the residents of the development.

The **Goal** of the OWMP is to achieve a residential recycling rate of 50% of managed municipal waste by 2020 (and future targets in subsequent Regional Waste Management Plans).

All residential units will have a 3-bin system (non-recyclable, organic and recyclable) in each kitchen to encourage residents to segregate waste at source.

Apartment residents will be provided with waste recycling and waste disposal information by the development's Facility Management Company who will be responsible for providing clean, safe and mobility impaired accessible communal waste storage areas for the apartment blocks.

The Facility Management Company shall maintain a register of all waste volumes and types collected from the development each year including a break-down of recyclable waste and where necessary, shall introduce initiatives to further encourage residents to maximise waste segregation at source and recycling. They shall also provide an annual bulky waste and WEEE and waste battery collection service for all residents.

The development shall be designed to provide adequate domestic waste storage areas for each apartment blocks. This will promote the appropriate segregation at source of domestic generated waste from all residential units at the development. Communal waste bin storage areas shall be designed in a manner to ensure that appropriate signage for the correct disposal and recycling of waste is available for residents.

11.14 MONITORING

11.14.1 Construction Phase Waste Monitoring

The Construction Manager will maintain a written record of all quantities and types of construction wastes generated, reused / recycled and exported off-site during the construction phase.

The following information shall be recorded for each load of waste exported off-site:

- Waste Type EWC Code and description.
- Volume of waste collected.
- Waste collection contractor's Waste Collection Permit Number and collection receipt including vehicle registration number.
- Destination of waste load including Waste Permit / Licence number of facility.
- Description of how waste at facility shall be treated i.e. disposal / recovery / export

Waste Management Auditing

In order to ensure that construction wastes generated during the course of the development are being effectively managed and recorded, a waste management audit shall be conducted on a routine basis to determine compliance with the Construction Waste Management Plan.

11.14.2 Operational Phase Waste Monitoring

The Facility Management Company shall prepare an annual report for the Local Authority and residents of the development on the quantities of waste generated within the development to demonstrate how waste reduction and recycling targets are being achieved with regard to the targets defined in the current Eastern-Midlands Region Waste Management Plan.

17.14 MATERIAL ASSETS – UTILITIES

17.14.1 Construction Mitigation

17.14.1.1 Surface Water Drainage

The Contractor will be required to prepare and implement a Surface Water Management Plan that ensures avoidance and minimisation of effects. Surface water storage in excavations may be directed to on-site settlement ponds, where silt removal will be facilitated prior to discharge off site at a controlled rate. Periodic testing of the surface water discharge may also be undertaken. The Surface Water Management Plan will include the relevant mitigation contained in the EIA and CEMP included with the application.

If concrete mixing is carried out on site, the mixing plant will be sited in a designated area with an impervious surface. To minimise any impact on the water environment from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas or chemical storage containers.

17.14.1.2 Foul Drainage

Any construction phase discharge to the wastewater sewerage infrastructure shall comply with the conditions of a Discharge Licence from Irish Water. To reduce the risk of defective or leaking sewers, all new sewers will be pressure tested and CCTV surveyed to ascertain any possible defects. Such defects, if they arise, would be repaired prior to the connection of any future development to the sewers.

17.14.1.3 Water Supply

The watermains will be tested according to the requirements of Irish Water prior to commissioning. Full and detailed surveys of the existing watermains to be upgraded, diverted or removed will be undertaken in advance of the works with works appropriately planned and sequenced to ensure that risk of any temporary loss of supply to local residents is negated.

17.14.1.4 Electricity Supply

The ESB will install all of the new incoming supplies to the proposed development. All electrical work will be carried out by authorised personnel who have the required expertise. ESB will also liaise with residents and keep customers fully informed of any brief outages which may be required. Any construction phase site lighting or security installed by the contractor will be looking inwards to the compound and will not impact on neighbouring properties. All work in the vicinity of the ESB network will be completed in compliance with the ESB document 'National Code of Practice for the Customer Interface'.

17.14.1.5 Gas Supply

Gas Networks Ireland will carry out all works on the gas supply network in a controlled manner to avoid loss of service to existing customers. All work in the vicinity of gas transmission network will be completed in compliance with the Bord Gais Networks document 'Code of Practice 2011 – Working in the Vicinity of the Transmission Network'.

17.14.1.6 Telecommunications

The relevant utility provider will install all of the new incoming supplies to the new development. All work will be carried out by authorised personnel who have expertise in the required works. This will minimise disruption to surrounding areas. All work in the vicinity of the telecommunications network will be completed in compliance with the relevant telecommunication providers 'Code of Practice' document.

17.14.2 Operational Phase Mitigation

17.14.2.1 Surface Water Drainage

Surface water runoff from the proposed development will be managed in accordance with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS), with surface water attenuation and retention included as part of the main surface water drainage system.

The surface water management proposals would reduce the overall impact of the subject site on the existing environment by adopting a SuDS approach by combining elements such as green roofs, bio-retention areas, pervious paving, attenuation storage and flow control within the proposed development.

The proposed drainage system will be commissioned and subject to a regular operational inspection and maintenance regime to ensure the system keeps operating within the design specifications.

17.14.2.2 Foul Drainage

The proposed wastewater drainage system is designed in accordance with I.S. EN12056: 2000 '*Gravity Drainage Systems inside Buildings*', I.S. EN752: 2017 '*Drain & Sewer Systems outside Buildings*' and Irish Water's '*Code of Practice for Wastewater*'. The proposed drainage system will be commissioned and subject to a regular operational inspection and maintenance regime to ensure the system keeps operating within the design specifications.

17.14.2.3 Water Supply

The proposed watermain infrastructure is designed in accordance with Irish Water's '*Code of Practice for Water Infrastructure*'. The proposed water supply system will be commissioned and subject to a regular operational inspection and maintenance regime to ensure the system keeps operating within the design specifications.

17.14.2.4 Electricity Supply

All proposed power cables within the development will be underground or internal within buildings and will be installed according to ESB Networks specifications. The proposed electricity supply system will be commissioned and subject to a regular operational inspection and maintenance regime to ensure the system keeps operating within the design specifications.

17.14.2.5 Gas Supply

There are no gas connections proposed to the development.

17.14.2.6 Telecommunications

All proposed telecommunications cabling within the development will be underground or internal within buildings.

17.14.3 Monitoring

17.14.3.1 Surface Water Drainage

Upon installation of new surface water drains, pressure tests will be carried out to assess the potential for leaks to occur in the newly constructed drains.

17.14.3.2 Foul Drainage

Upon installation of new foul drains, pressure tests will be carried out to assess the potential for leaks to occur in the newly constructed drains.

17.14.3.3 Water Supply

Upon installation of new watermains, pressure tests will be carried out to assess the potential for leaks to occur in the newly constructed watermains. The proposed watermain system will incorporate water meters at all points of connection to the public watermain network; this will facilitate ongoing monitoring of demand and assessment for potential leakage.

17.14.3.4 Electricity Supply

ESB will test and commission their installation and will monitor and maintain their ESB sub-stations and network cabling post installation. All supplies will be individually metered to allow the new loads on the network to be monitored in use.

17.14.3.5 Gas Supply

All natural gas pipework will be installed and pressure tested in accordance with I.S. 820 and Gas Networks Ireland guidelines and a non-domestic certificate of conformance will be required from the contractor prior to gas being switched on. Gas detection systems will be provided where appropriate and will be linked to the Building Management System to shut off the gas supply in the event of a leak.

17.14.3.6 Telecommunications

The providers of incoming telecommunications supplies will test and commission all their cabling/ work and will monitor and maintain their network cabling post installation.

17.15 CULTURAL HERITAGE – ARCHAEOLOGY

17.15.1 Construction Phase

17.15.1.1 Archaeology

All ground disturbances associated with the proposed development will be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the Department of Housing, Local Government and Heritage (DoHLGH) and the Dublin City Archaeologist.

17.15.1.2 Cultural Heritage

No specific mitigation measures are required relating to the cultural heritage resource at construction stage.

17.15.2 Operational Phase

17.15.2.1 Archaeology

As there are no potential impacts on the archaeological heritage of the proposed development area during operation, no mitigation is deemed necessary.

17.15.2.2 Cultural Heritage

Permanent information installations are to be created throughout the development to inform the general public of the history and cultural heritage significance associated with the location.

17.15.3 Monitoring

17.15.3.1 Construction and Operational Phase

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

17.16 CULTURAL HERITAGE – ARCHITECTURAL HERITAGE

17.16.1 Construction Phase

It is recommended that protection is put in place around the remaining section of boundary wall in order to limit any impact damage to the wall during construction works (including demolition works).

In relation to the works to remove sections of the boundary wall a method statement which contains appropriate mitigation measures such as propping during the construction work and repointing of the whole wall on completion of the works has been prepared and is included in Appendix C of Volume III of the EIAR. The method statement forms part of the mitigation for the project.

The remaining section of the wall is to undergo conservation works including repointing, stone replacement and works to the wall top. Where sections of wall are to be removed, the stone will be reused elsewhere on the wall in areas where repairs will be carried out.

Vibration limitation are to be calculated and mitigation measure to lessen damage by vibration are to be put in place. To mitigate the potential direct effect on the boundary wall the means of excavation of the land within the site in the vicinity of the wall and other adjacent protected structures should be designed so as to minimise any vibration that would be likely to cause damage to the building. Chapter 8, Noise and Vibration, has predicted that the vibration levels during construction (including demolishing works of structures in northern part of site) are not likely to be such that any damage would occur to built heritage structures, notwithstanding the adoption of lower limits of vibration for the protected structures. The Noise and Vibration chapter has proposed mitigation through monitoring in accordance

with the relevant standards to ensure that vibration levels do not exceed acceptable levels in the vicinity of built heritage structures.

17.16.2 Operational Phase

The new openings to be introduced along the original boundary wall as part of the proposed development will be carried out in conjunction with conservation works to the existing masonry to ensure the survival of historic fabric. The retention of much of the historic wall, together with the introduction of active use in the vicinity of the wall, will reduce the defensive character to the wall while respecting it as a boundary element to the former barracks site. The War Department Boundary marker stone currently located in the wall will be moved to a new location along the wall. Corten steel will be added to the top of the wall as an indicator to wall's original height.

The juxtaposition of new elements, whether buildings or planting can also be seen to highlight the particular and contrasting nature of the remaining section of wall. Monitoring works are to be carried out to ensure no damage to existing historic fabric occurs.

The development has been designed in a way that mitigates the overall impact of the proposed building on the existing historic structures. The inclusion of setbacks allow for greater sightlines towards historic structures. Public open spaces and green areas close to historic buildings act as a buffer zone and soften the visual impact of the development.

Interpretive signage will be introduced to inform the general public of the site's past. The portion of the boundary wall along St. Vincent's Street West is to be referenced in the proposed development.

17.16.3 Monitoring Construction and Operational Phase

The mitigation measures recommended above would also function as a monitoring system during construction to allow the further assessment of the scale of the predicted impacts and the effectiveness of the recommended mitigation measures. A Conservation architect will be part of each design team during the preparation of construction documents, tender process and during the construction of the proposed developments.

Monitoring will be carried out by a Conservation Architect to ensure no damage to existing historic fabric occurs during the construction phase.

During the construction phase it will be necessary to monitor vibration levels, to ensure that no damage occurs to Richmond Barracks including the boundary wall, through vibration effects. Chapter 8, Noise and Vibration, sets down the criteria for monitoring during construction.

Annual inspections and cleaning (where necessary) is proposed in respect of the wall during the operational phase in order to maintain its appearance and integrity.

17.17 RISK MANAGEMENT FOR MAJOR ACCIDENTS

The Construction Management Plan and the Health and Safety Plan (which will use the mitigation in the EIAR) will limit the risk of accidents during construction. Fire safety will be dealt with under the Fire Safety Code at design and construction stage. The estate management company will have responsibility for fire safety during operations.

The proposed development will involve ground works to facilitate the proposed development. Site investigations have been carried out (refer to Appendix D1, Volume III of this EIAR) and have not identified any hazardous material with the exception of TP54 at 1.00mBGL where the results indicate that the total organic carbon is above the inert limits (3.86% vs 3%). Note TP 54 is within the subject site to the north west of the site. All spoil disposed of off-site will be sent to a suitably licensed facility. Further site investigation and WAC (Waste Acceptance Criteria) testing will be carried out prior to construction to inform the detailed design. In the event that any hazardous material is identified the appropriate measures will be taken in accordance with the requirements of the EPA. The excavation and movement of soil from the site will be undertaken by a registered specialist contractor and removed to a licensed facility. The following are outlined:

- Hazardous materials used during construction will be appropriately stored so as not to give rise to a risk of pollution.

- In the event of storms or snow, construction activity can be halted, and the site secured. The construction activity will involve a number of potential risks, as set out below. The risks identified include traffic management, and fire strategy.
- During the construction stage, the risk of accidents associated with the proposed development are not predicted to cause unusual, significant or adverse effects to the existing public road network. The vast majority of the works are away from the public road in a controlled environment. The objective of which is to minimise the short term disruption to local residents and reduce the potential for accidents.
- Furthermore, it is expected that the risk of accidents would be low during the construction of the proposed development considering the standard construction practices which are to be used.
- With reference to natural disasters (e.g. flooding), the proposed development has undergone a Site Specific Flood Risk Assessment, prepared by DBFL Consulting Engineers. The main area of the site where development is proposed is low risk of fluvial, pluvial or groundwater flooding.
- A Health and Safety Plan will be prepared (required by the *Safety, Health and Welfare at Work (Construction) Regulations 2013*) to address health and safety issues from the design stages through to the completion of the construction and maintenance phases. The Health and Safety Plan will comply with the requirements of the Regulations and will be reviewed as the development progresses.
- Safety on site will be of paramount importance. Only contractors with the highest safety standards and training will be selected. During the selection of the relevant contractor and the respective subcontractors their safety records will be investigated.
- Prior to working on site, each individual will receive a full safety briefing and will be provided with all of the safety equipment relevant to the tasks the individual will be required to perform during employment on site.
- Safety briefings will be held regularly and prior to any onerous or special task. ‘Toolbox talks’ will be held to ensure all workers are fully aware of the tasks to be undertaken and the parameters required to ensure the task will be successfully and safely completed.
- All visitors will be required to wear appropriate personal protective equipment prior to going on to the site and will undergo a safety briefing by a member of the site safety team.
- Regular site safety audits will be carried out throughout the construction programme to ensure that the rules and regulations established for the site are complied with at all times.

The design and specification of materials has been reviewed with regard to their likely use based on experience from previous construction projects during the initial design phase so as to minimise potential impact during construction. Where required technical data information will be procured and assessed with reference to the developed Preliminary Safety Plan for the project (Hazardous materials are a recognised ‘Particular Risk’ under safety legislation and as such is addressed in detail in design risk assessment information). A site layout drawing will be prepared by the lead designer indicating site access routes, indicative site compound, existing services and locations of material storage.

In the event of storms or snow, construction activity can be suspended, and the site secured. The construction activity will involve a number of potential risks as set out in the construction management plan. The risks identified include, flood risk, movement of site vehicles and co-ordination with other projects and contractors with regard to traffic management, design and construction of temporary support works to ensure the stability of partially erected structures, working at height, construction impacts on the local road network and fire strategy. In addition, a fire safety management plan and risk assessment will be prepared by the main contractor and reviewed by the PSDP as part of the overall construction safety plan. This will reduce hot works on site and management remaining fire safety issues through a formal permit to work system. The safety plan will also highlight emergency preparedness and planning throughout the construction phase.

Table 17.4 – Strategy for tackling potential risks

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION
Risk Number	Risk Description / Risk Event Statement	Responsible	Impact H / M / L	Probability H / M / L	Actions
Provide a unique identifier for risk	A risk event statement states (i) what might happen in the future and (ii) its possible impact on the project.	Name or title of team member responsible for risk	Enter H (High); M (Medium) ; or L (Low) according to impact definitions	Enter H (High), M (Medium) or L (Low) according to probability definitions	List, by date, all actions taken to respond to the risk. This does not include assessing the risk
1	Work which puts persons at risk of:-burial under earth falls. Risk of burial under earthfalls in trenches.	Project Supervisor Construction Stage (PSCS)	H	M	Contractor to address requirement for trench support. Excavations are to be carried out at safe slope. Refer to site investigation for same and temporary works engineer to design.
2	Scaffolding Risk of falling from scaffolding, ladders or unprotected edges/open voids during the construction phase.	PSCS	H	M	Working at height required throughout the project. Installation of scaffolding for all working at height activities to be subject to a full temporary works design submission. In order to fully Co-Ordinate any temporary works submission the Project Supervisor for the Design Process must receive the following items before reviewing any submission; A full design submission, Calculations for the design, Design Risk Assessment, Copy of designer's PI insurances, Designers CV. This submission can then be reviewed by the Permanent Works Engineer to ensure the design will not impact on the permanent structure.

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION
3	<p>Fire Strategy</p> <p>Risk of fire damage to houses or to partially complete new apartment blocks from construction activities.</p>	PSCS/ PSDP / Fire SC.	H	M	<p>Fire strategy must be put in place in advance of start on site which must take into consideration the requirement for hot works and the provision of Hot Works Permit systems to manage Hot works when needed. A fire marshal will be required - full co-operation from site supervisors and contractors will be required. Specification of materials will be reviewed during design and in submittals from the contractor with the objective of ensuring compliance with current standards and minimising fire load</p>
4	<p>Lifting Operations</p> <p>Work involving the assembly or dismantling of heavy pre-fabricated components.</p> <p>Risk of injury during the assembly of precast columns, stairs, façade panels, etc.</p>	PSCS	H	M	<p>Lifting operations using cranes will be a requirement during the project. The PSCS must identify this as a risk factor ensuring the ground conditions are tested and appropriate to point loading from mobile cranes. The PSCS must ensure there is a fully risk assessed lift plan to manage all lifting operations on site.</p>
5	<p>Existing Utilities</p> <p>Work near overhead electric cables, risk of Electrocutation</p> <p>Impact with existing services</p>	PSCS/PSDP	H	M	<p>Information on the existence of live overhead ESB cables on site is to be provided to the PSCS via the Tender pack. The sequence of work to be planned to avoid working in close proximity to the lines. Information on existing services and new services installed and connected for the project works will be included in the Safety File. These will include 'as-built' drawings</p>

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION
					indicating the locations and routes as well as physical identification and signage of all services to enable safety procedures to be adopted for any works. The PSCS to arrange for the relocation of the lines prior to working around them. The PSCS must follow the ESB code of practice and provide a risk assessed RAMS document to manage this hazard.
6.	Construction Traffic Working adjacent to live construction and normal traffic.	PSCS/PSDP	H	M	Contractor to prepare and implement a Construction Traffic Management Plan to be agreed with the design team to ensure public safety. The contractor is to supervise vehicle movements during construction and enforce the traffic management plan.
7	Contamination Encountering contamination and/or existing hazardous materials during excavation works Contact with hazardous materials and/ or pollution	PSCS	H	M	Full site investigation surveys and reports completed during the design phase of the project. Reports are updated as required during construction with all information included in the safety file

