ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR)

In respect of

Mixed Use Development at 23-25 Moss Street, 2-6 Gloucester Street & 1-6 City Quay, Dublin 2

Prepared for

Ventaway Limited

December 2024

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DOCUMENT CONTROL SHEET

Client:	Ventaway Limited
Project Title:	Moss Street, Gloucester Street & City Quay
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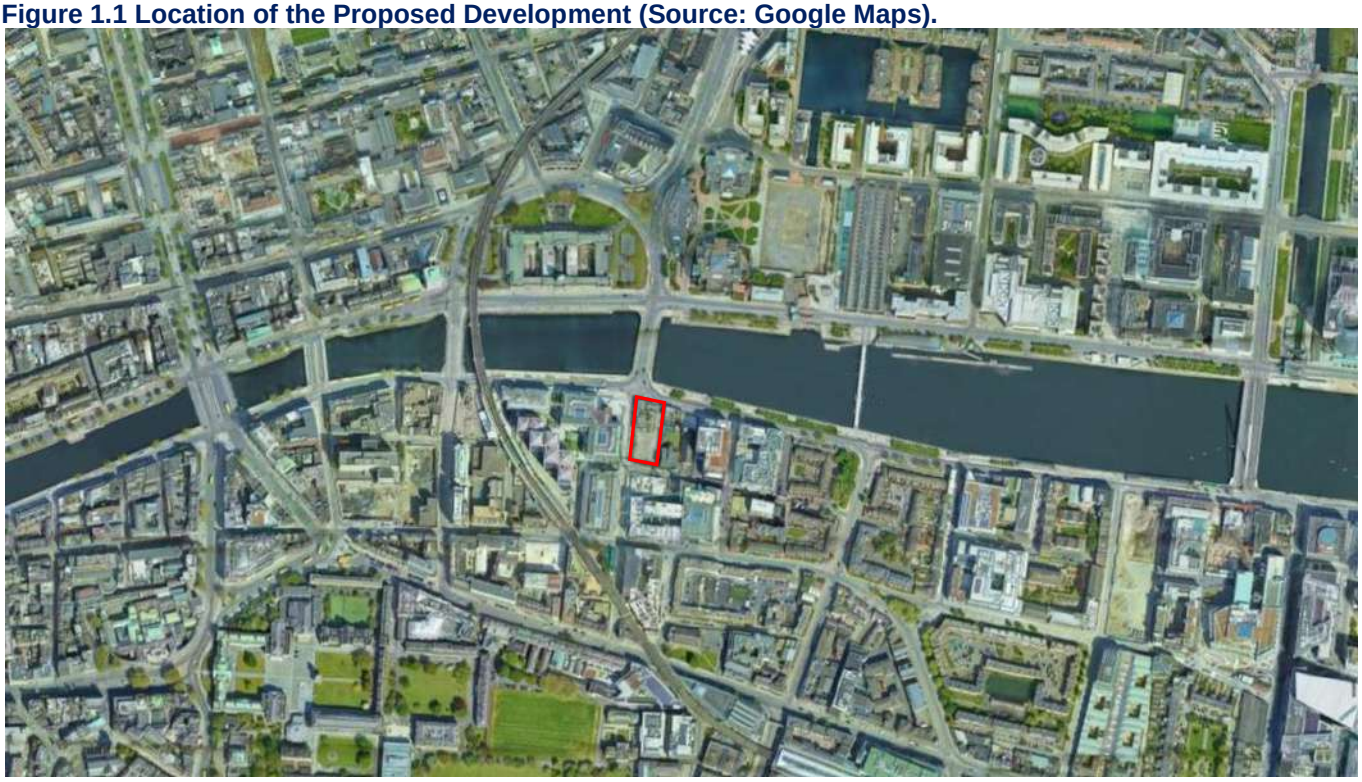
1.0 INTRODUCTION

1.1 INTRODUCTION AND TERMS OF REFERENCE

John Spain Associates, Planning & Development Consultants, and the associated environmental consultants, have been commissioned by, Ventaway Limited, to prepare an Environmental Impact Assessment (EIA) Report in respect of an application to Dublin City Council (DCC) for the demolition of the existing disused former City Arts Centre Building and construction of a 14 storey mixed use building containing an office development and arts and cultural spaces on a parcel of land comprised of 1-4 City Quay, Dublin 2 D02KT32, 23-25 Moss Street, Dublin 2 D02 F854 and 5 City Quay, Dublin 2 D02PC03.

The location of the proposed development is shown in Figure 1.1 below. The lands primarily comprise the former City Arts Centre Building and associated hard standing bounded to the north by City Quay, to the west by Moss Street, and to the south by Gloucester Street South. The City Quay Covid testing centre and City Quay National school adjoin the eastern boundary of the subject lands.

Figure 1.1 Location of the Proposed Development (Source: Google Maps).



Source: Google Map

The proposed development comprises:

- Demolition of the existing buildings and structures (it is noted the structures or part thereof may be demolished in compliance with a Dangerous Buildings Notice prior to a decision being made);
- Construction of a mixed use building up to 14 storeys in height (c. 58 metres above ground) over a double basement;
- The offices are proposed from 1st to 13th floor (14th storey) with terraces at 6th, 9th, 11th and 12th floor levels;
- The arts and cultural spaces are contained at ground and lower ground floor levels;
- The basement level (B1) provides for 11 no. car parking spaces;
- 330 no bicycle spaces will be provided. 314 no. long stay spaces will be provide at lower ground floor level and 16 no. short stay spaces will be provided at ground floor level on Moss Street.
- The overall gross floor area of the development comprises 28,569 sq.m. including 910 sq.m. arts centre and 23,501 sq.m. offices;
- All ancillary and associated works and development including plant, temporary construction works, public realm, landscaping, utilities connections and infrastructure.

A detailed description of the proposed development with greater detail regarding the development site and its surrounds can be reviewed within Chapter 2 of this EIA Report document.

The central purpose of the EIA process is to undertake an assessment of the likely and significant impact on the environment of the proposed development in parallel with the project design process, and to document this process in an Environmental Impact Assessment Report (EIAR); which is then submitted to the competent/consent authority, in order to inform the subsequent decision as to whether the development should be permitted to proceed.

This EIA Report document has been prepared in accordance with the European Union EIA Directive 85/337/EC as amended by 97/11/EC, 2003/4/EC, 2011/92/EU and Directive 2014/52/EU.

The EIA Report has also been prepared in accordance with the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (published in August 2018) and the 2022 Guidelines on the information to be contained in Environmental Impact Assessment Reports published by the EPA.

This Chapter describes the methodology via which the Environmental Impact Assessment (EIA) Report was carried and prepared. The methodology used is broadly consistent across all chapters in order to ensure the EIA Report is clear and easy to navigate.

1.2 CONTEXT

1.2.1 Legislative Requirements

The requirement for EIA for certain types and scales of development is set out in the EIA Directives (2011/92/EU and 2014/52/EU), European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (the bulk of which came into operation in September 2018), the European Communities (Environmental Impact Assessment) Regulations 1989-2006, Planning and Development Act 2000 (as amended) and the Planning and Development Regulations 2001-2019. It should be noted that this EIA Report is prepared in accordance with the 2011 EIA Directive (2011/92/EU), as amended by the 2014 EIA Directive.

The EIA Directives list those projects for which an EIA is mandatory (Annex I) and those projects for which an EIA may be required (Annex II). With regard to Annex II projects, Member States can choose to apply thresholds or use case by case examination or a combination of both to assess where EIA is required. In Ireland, a combination of both has been applied.

The project proposed is not listed under Annex I EIA Directives and it is below the relevant threshold as set out in the Planning and Development Regulations 2001-2018 for Annex II projects. The threshold for “Urban development which would involve an area greater than 2 hectares in the case of a business district” as set out in Part 2 of Schedule 5 (10(b)iv) of the Regulations was considered to be most relevant threshold in the context of the proposed development in the subject location. The proposed development does not exceed this threshold, however in light of proximity to the Customs House and the potential for visual impact the Applicant has decided to voluntarily prepare an EIA Report.

The main objective of an EIA, as set out in Article 3(1) of the 2014 EIA Directive, is to identify, describe and assess the direct and indirect significant impacts of a project on population and human health, biodiversity, land, soils, water, air & climate (including noise), material assets, cultural heritage and the landscape and the interaction between the aforementioned factors. The EIA Report reports on the findings of the EIA process to date and informs the Planning Authority, statutory consultees, other interested parties and the public in general about the likely effects of the project on the environment.

1.2.2 Format and Structure of this EIA Report

This EIA Report has been prepared in accordance with the requirements of EIA Directives (2011/92/EU and 2014/52/EU). It is prepared in the Grouped Format Structure following the guideline structure set down in the Environmental Protection Agency (EPA) “Guidelines on the Information to be Contained in Environmental Impact Assessment Reports” (May 2022).

The *“Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment”* (August 2018) and the European Commission Guidance on the preparation of the Environmental Impact Assessment Report have also been considered in the preparation of the EIA report.

The structure of the EIA Report is set out in Table 1.1 below.

Table 1.1 Structure of this EIA Report

Ch./Vol.		Title	Content
Vol. 1		Non-Technical Summary	Provides a concise non-technical summary of the information contained in the EIA Report.
Vol. 2	Ch. 1	Introduction	Sets out the purpose, methodology and scope of the document.
Vol. 2	2	Project Description	Sets out the description of the site, design and scale of the proposed development.
Vol. 2	3	Alternatives	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.
Vol. 2	4	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.
Vol. 2	5	Land, Soils, Geology and Hydrogeology	Provides an overview of the baseline position, the potential impact of the proposed development on the site's soil and geology and impacts in relation to land take and recommends mitigation measures.
Vol. 2	6	Water and Hydrology	Provides an overview of the baseline position, the potential impact of the proposed development on water quality and quantity and recommends mitigation measures.
Vol. 2	7	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.
Vol. 2	8	Air Quality and Climate	Provides an overview of the baseline air quality and climatic environment, the potential impact of the proposed development, and recommends mitigation measures.
Vol. 2	9	Noise and Vibration	Provides an overview of the baseline noise environment, the potential impact of the proposed development and recommends mitigation measures.
Vol. 2	10	Archaeology and Cultural Heritage	Provides an assessment of the site and considers the potential impact of the proposed development on the local archaeology and cultural heritage; and recommends mitigation measures.
Vol. 2	11	Traffic and Transport	Provides an assessment of the site and considers the potential impact of the proposed development on the local road network; and recommends mitigation measures.
Vol. 2	12	Material Assets - Waste	Describes the existing waste requirements of the proposed development and the likely impact of the proposed development on this material assets.
Vol. 2	13	Material Assets - Utilities	Describes the existing services and infrastructural service requirements of the proposed development and the likely impact of the proposed development on this material assets.
Vol. 2	14	Interactions of the Foregoing	Describes the potential interactions and interrelationships between the various environmental factors.
Vol. 2	15	Principal Mitigation and Monitoring Measures	Sets out the key mitigation and monitoring measures included in the above chapters of the EIAR Document for ease of reference.
Vol. 3		Landscape and Visual Impact	Details the likely effects on the landscape and visual environment of the proposed development with reference to accompanying photomontages.

Using the Grouped Format Structure, the EIA Report examines each environmental aspect in a separate chapter. Each chapter generally covers the following:

- Receiving Environment;
- Characteristics of the Proposed Development;
- Potential Impacts of the Proposed Development;
- Do-Nothing Scenario;
- Remedial and Mitigation Measures;
- Predicted Impacts of the Development; and
- Cumulative Impacts.

A Non-Technical Summary of the findings of the EIA Report is provided as a separate document.

Mitigation measures applicable to each specialism are provided within the relevant chapters of this EIA Report.

A description of projects that have been assessed cumulatively with the proposed development are provided in Section 2.8 of this EIA Report and in supporting planning documentation. Cumulative impacts for each environmental topic are assessed within the relevant specialist chapters of this EIA Report.

Interactions i.e. the interrelationship between each environmental aspect, are also assessed as they occur in each chapter. The final chapter of the EIA Report, Chapter 16 shows where interactions have been identified and how they have been addressed

1.3 CONSULTATION

JSA, the applicant and the proposed development project team have liaised with the relevant departments of DCC in advance of lodgement of this application. Pre-application meetings were held with DCC Planning, Drainage and Transport Departments. Officials from DCC and members of the design and developer team attended. A number of specific issues, concerns and suggestions were raised and further details regarding how they have been implemented into the design are provided in the planning application documents.

In addition, relevant specialist in the proposed development project team have liaised with statutory bodies (including Roads/Transportation, Irish Water and ESB) by correspondence and access to online databases during the course of the EIA Report preparation.

JSA and the other respective EIA contributors/authors have incorporated all relevant advice and comments received from consultees into the relevant chapters of this EIA Report.

1.4 EIA PROJECT TEAM

1.4.1 EIA Project Management

This EIA was project managed, co-ordinated and produced by John Spain Associates in association with a team of specialist environmental consultants, the applicant and overall design team. John Spain Associates' role was to coordinate the EIA process and to liaise between the design team and various environmental specialist consultants. John Spain Associates were also responsible for editing the EIA Report document to ensure that it is cohesive and not a disjointed collection of disparate reports by various environmental specialists. John Spain Associates does not accept responsibility for the input of specialist consultants or the design team.

1.4.2 EIA Environmental Specialists

Environmental specialist consultants were also commissioned for the various technical chapters of the EIA Report document which are mandatorily required as per the EIA Directive and Regulations.

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'.

In order to outline compliance with this requirement and in line with emerging best practice the EIA Report states the names of the environmental consultants who have prepared each element of the EIA Report and lists their qualifications and relevant experience, demonstrating that the EIA Report has been prepared by competent experts. This is also in accordance with the 2018 EIA Guidelines for Planning Authorities and An Bord Pleanála.

Each environmental specialist 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 Report and their inputs are set out in Table 1.2 below.

Table 1.2 Relevant Specialist Consultants

Chapter/Volume No.		Chapter Title	Consultant
Volume 1		Non-Technical Summary	John Spain Associates and others
Vol. 2	Chapter 1	Introduction	John Spain Associates – Blaine Cregan
Vol. 2	Chapter 2	Description of the Proposed Development	John Spain Associates – Blaine Cregan
Vol. 2	Chapter 3	Alternatives	John Spain Associates – Blaine Cregan
Vol. 2	Chapter 4	Population and Human Health	John Spain Associates – Blaine Cregan
Vol. 2	Chapter 5	Land, Soils, Geology & Hydrogeology	CS Consulting – Linganand Jewargi and Niall Barrett
Vol. 2	Chapter 6	Biodiversity (Flora and Fauna)	Altemar – Bryan Deegan, Hugh Delaney
Vol. 2	Chapter 7	Water and Hydrology	CS Consulting – Linganand Jewargi and Niall Barrett
Vol. 2	Chapter 8	Air Quality & Climate	Byrne Environmental – Ian Byrne
Vol. 2	Chapter 9	Noise & Vibration	Byrne Environmental – Ian Byrne
Vol. 2	Chapter 10	Archaeological, Architectural and Cultural Heritage	IAC – Faith Bailey
Vol. 2	Chapter 11	Traffic and Transportation Assessment	CS Consulting – Linganand Jewargi and Niall Barrett
Vol. 2	Chapter 12	Material Assets - Waste	Byrne Environmental – Ian Byrne
Vol. 2	Chapter 13	Material Assets - Utilities	CS Consulting – Linganand Jewargi and Niall Barrett
Vol. 2	Chapter 14	Interactions	John Spain Associates – Blaine Cregan
Vol. 2	Chapter 15	Mitigations	John Spain Associates – Blaine Cregan
Volume 3		Landscape and Visual Impact	City Designer– Richard Coleman

The relevant experience and qualifications of the authors are set out within the chapters.

1.5 DESCRIPTION OF IMPACTS IN THE EIA REPORT

The EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports 2022 require that the direct, indirect, cumulative and residual impacts of the proposed development for both the construction and operational stages are described. The identified quality, significance and duration of effects for each aspect are categorised, as set out below. Quality refers to the nature of the impact, significance of effects refers to the degree that these will impact on the site and surrounding area and duration refers to how long the effects are likely to last

for. A direct impact is an impact the development will give rise to. An indirect impact is similar to a secondary impact – it may result in consequences not in the immediate vicinity of the site. Cumulative impacts are impacts that arise in conjunction with other consented developments. Residual impacts are those which remain after mitigation measures have been applied.

The quality, magnitude and duration of potential effects are defined in accordance with the criteria provided in the EPA EIA Report Guidelines 2022 as outlined in Table 1.3.

Table 1.3 Description of Effects as per EPA Guidelines (2022)

Characteristic	Term	Description
Quality of Effects	Positive	A change which improves the quality of the environment
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/Adverse	A change which reduces the quality of the environment
Describing the Significance of Effects[1]	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
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?)
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.

[1] For the purposes of facilitating the Competent Authority in conducting Environmental Impact Assessment as defined by Annex 1 of the EU Directive, the terms “imperceptible effects”, “not significant effects”, “slight effects”, and “moderate effects” used within this report, while exhibiting varying degrees of impact, are all considered to be without significant consequence.

	Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects	Momentary Effects	Effects lasting from seconds to minutes
	Brief Effects	Effects lasting less than a day
	Temporary Effects	Effects lasting less than a year
	Short-term Effects	Effects lasting one to seven years.
	Medium-term Effects	Effects lasting seven to fifteen years
	Long-term Effects	Effects lasting fifteen to sixty years
	Permanent Effects	Effects lasting over sixty years
	Reversible Effects	Effects that can be undone, for example through remediation or restoration
	Frequency of Effects	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Describing the Type of Effects	Indirect Effects (a.k.a secondary or Off-site 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 Sox and NOx to produce smog)

1.6 ADDITIONAL ASSESSMENTS REQUIRED

This section addresses the additional approvals and assessments required under other EU Directives and legislation.

- Appropriate Assessment – an Appropriate Assessment Screening Report and a Natura Impact Statement has been completed for the proposed development, as required under the Habitats and Birds Directive (92/43/EEC and 79/409/EEC) and are included with the planning application.

- Flood Risk Assessment - A Stage 3 Flood Risk Assessment has been undertaken for the site and is also included with the planning application.

- Resource Waste Management Plan – A RWMP has been prepared in line with 'A Waste Action Plan for a Circular Economy. Ireland's National Waste Policy. 2020-2025'. DECC, 2020, and 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects', EPA, 2021. The report is included as part of the planning application.

1.7 FORCASTING METHODS AND DIFFICULTIES IN COMPILING THE SPECIFIED INFORMATION

Forecasting methods and evidence used to identify and assess the significant effects on the environment for each environmental aspect are set out in each chapter.

There were no significant difficulties in compiling the specified information for this EIA Report. Any issues encountered during the assessment of individual factors are noted within the relevant chapters.

1.8 EIA REPORT QUALITY CONTROL

John Spain Associates is committed to consistently monitoring the quality of EIA Report 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 Department Housing, Local Government and Heritage published guidelines on Environmental Impact Assessment for Planning Authorities and the Board (published August 2018), and the EPA have published guidelines on the information to be contained in an Environmental Impact Assessment Reports which have been consulted in the preparation of this EIA Report.

1.9 ERRORS

While every effort has been made to ensure that the content of this EIA Report 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 Report.

1.10 REFERENCES

- **Department Housing, Local Government and Heritage, 2018.** *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.* Environmental Protection Agency. The Department Housing, Local Government and Heritage.

- **Environmental Protection Agency, 2022.** *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.* Environmental Protection Agency.

2.0 DESCRIPTION OF THE PROJECT

2.1 INTRODUCTION

As described in Chapter 1 the applicant is applying to Dublin City Council (DCC) for the demolition of the existing disused former City Arts Centre Building and construction of a 14 storey mixed use building containing an arts and cultural spaces, office and café on a parcel of land comprised of 1-4 City Quay, Dublin 2 D02KT32, 23-25 Moss Street, Dublin 2 D02 F854 and 5 City Quay, Dublin 2 D02PC03.

This chapter presents the description of the project comprising information on the site, design, size and other relevant features of the project as set out in the EIA Directive (2011/92/EU) as amended by EIA Directive (2014/52/EU), as well as the relevant guidance documents Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022) and Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015).

This section of the EIA Report has been prepared by John Spain Associates, Planning & Development Consultants, and provides a description of the proposed development. This chapter of the EIA Report was prepared by Blaine Cregan M.Sc. B.Sc. (hons) and B.Eng., Executive Director with John Spain Associates, and approved by John Spain, Managing Director.

Blaine has acted as lead planning consultant on a range of high-quality complex planning applications across the country over an extended period. Blaine has wide-ranging experience in the management and review of Environmental Impact Assessment (EIA) Reports for major commercial and mixed-use development and redevelopment projects. Inputs to this chapter have also been provided by Henry J Lyons, CS Consulting Engineers, BPC Engineers, Byrne Environmental Consulting and PMEP Consulting Engineers.

The description of the proposed development is one of the two foundations upon which an EIA Report 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).

2.2 DESCRIPTION OF THE EXISTING DEVELOPMENT SITE

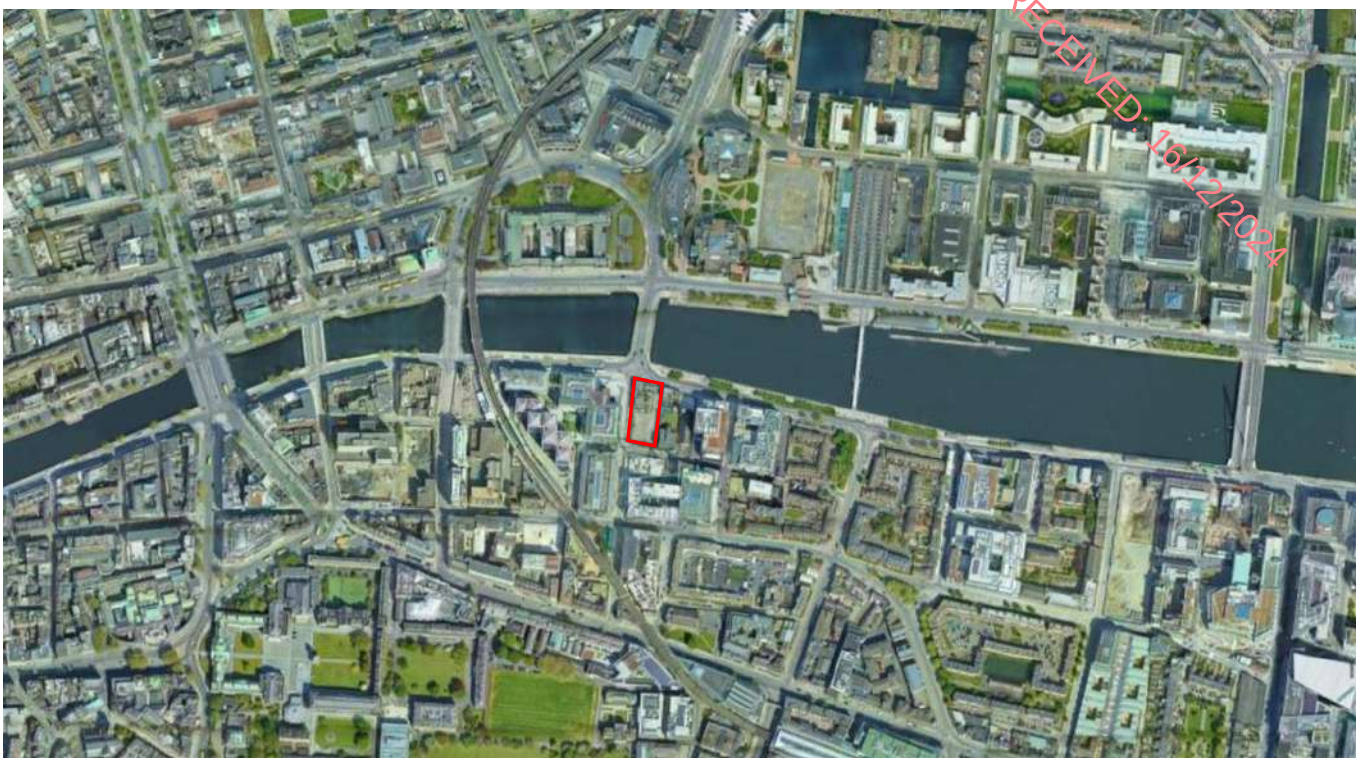
The site of the proposed development extends to c. 0.22 hectares. It is a rectangular plot of land, situated on City Quay on the southern side of the banks of the River Liffey, with the western boundary defined by Moss Street and the southern boundary by Gloucester Street South. City Quay National School is located along the eastern boundary. The Church of the Immaculate Heart of Mary and the associated presbytery are situated to the east of the City Quay National School and the Covid testing centre.

The subject lands are characterised as brownfield, 100% hardscaped developed lands. The north-western corner of the site contains the former City Arts building; an abandoned cluster of three storey, over basement derelict buildings which cover c. one-third of the subject lands. The remainder of the lands are hard paved and currently in use as surface car parking which is accessed via an entrance along the eastern perimeter from City Quay. A small single-storey shed is located within the southern yard along the western perimeter. There is an original Pooley Weighbridge located on the site which will be salvaged and incorporated into the public realm area of the proposed development. The perimeter of the site not delineated by the derelict buildings is lined with a wall formed from steel framework infilled with railway sleepers and corrugated sheeting.

The existing buildings on site are of no particular architectural importance or interest and are not included in the list of Protected Structures in the Dublin City Development Plan 2022-2028.

In the wider environs the subject lands sit opposite the IFSC (International Financial Services Centre), and the Custom House Building situated on the northern quays of the River Liffey. The Georges Quay office development lies to the west, and an aparthotel to the south. The remainder of the surrounding area is characterised by commercial and retail developments along with high density and medium density residential.

Figure 2.1. Aerial View of the Subject Site



Source: Google Map

Figure 2.2. Existing Buildings on Site

2.3 DESCRIPTION OF PHYSICAL CHARACTERISTICS OF THE WHOLE PROPOSED DEVELOPMENT

2.3.1 Description of the Development

The proposed development consists of the demolition of the existing buildings on site and the construction of a new office development and arts and cultural spaces at ground and lower ground floor level. The proposed development consists of the following elements:

- Demolition of the existing buildings and structures (it is noted the structures or part thereof may be demolished in compliance with a Dangerous Buildings Notice prior to a decision being made);
- Construction of a building up to 14 storeys in height (61.05 metres above ground) over a double basement including office use, arts centre and café, auditorium, and ancillary uses;
- The arts centre is contained at ground and lower ground floor levels;
- The offices are proposed from ground to 13th floor (14th storey) with terraces to all elevations;
- The double basement provides for 11 car parking spaces, 314 bicycle spaces, and 3 motorcycle parking spaces. 16 no. short stay bicycle spaces are provided at ground floor level along the western site boundary;
- The overall gross floor area of the development comprises 28,569 sq.m. including 910 sq.m. arts centre and 23,501 sq.m. offices;
- All ancillary and associated works and development including plant, temporary construction works, public realm, landscaping, telecommunications infrastructure, utilities connections and infrastructure.

Table 2.1. Summary of Key Site Statistics

Key Site Statistic	Detail
Site Area	0.22 ha (Gross)
Land Use Zoning	Z5 ‘City Centre’
Office	23,501 sqm
Arts and Cultural Space	910 sqm
Plant/Ancillary	4,024 sqm
Total floor area	28,569 sqm
Building Heights	Up to 14 storeys
Plot Ratio	11.14
Building footprint	2,117 sqm
Site Coverage	98.5%
Car Parking	11 spaces (incl. 6 no. car share spaces and 1 no. accessible space; 6 of the total 11 spaces will be equipped with EV charging facilities)
Motorcycle Parking	3 no. motorcycle spaces
Bicycle Parking	330 spaces (incl.314 no. long term and 16 no. short stay spaces)
Vehicular Access	Glouster Street South
Bin Store	99 sqm
Green Roof	576 sqm

2.3.2 Office Development

The office accommodation begins at the first-floor level and extends to the top floor of the building providing a total of 28,569 sqm office floor space. The main lift core containing seven lift shafts is centred in the building. Office users approach the lift core from the shared reception area, up a series of steps (or platform lift) past the roof-lit main office reception desk. The number of lifts reduces as they ascend the building, with four shafts from the 11th to the 13th floor levels. Two of the lift shafts throughout the levels serve as fire-fighting lifts with dual access to the main lift lobby and the fire-fighting core.

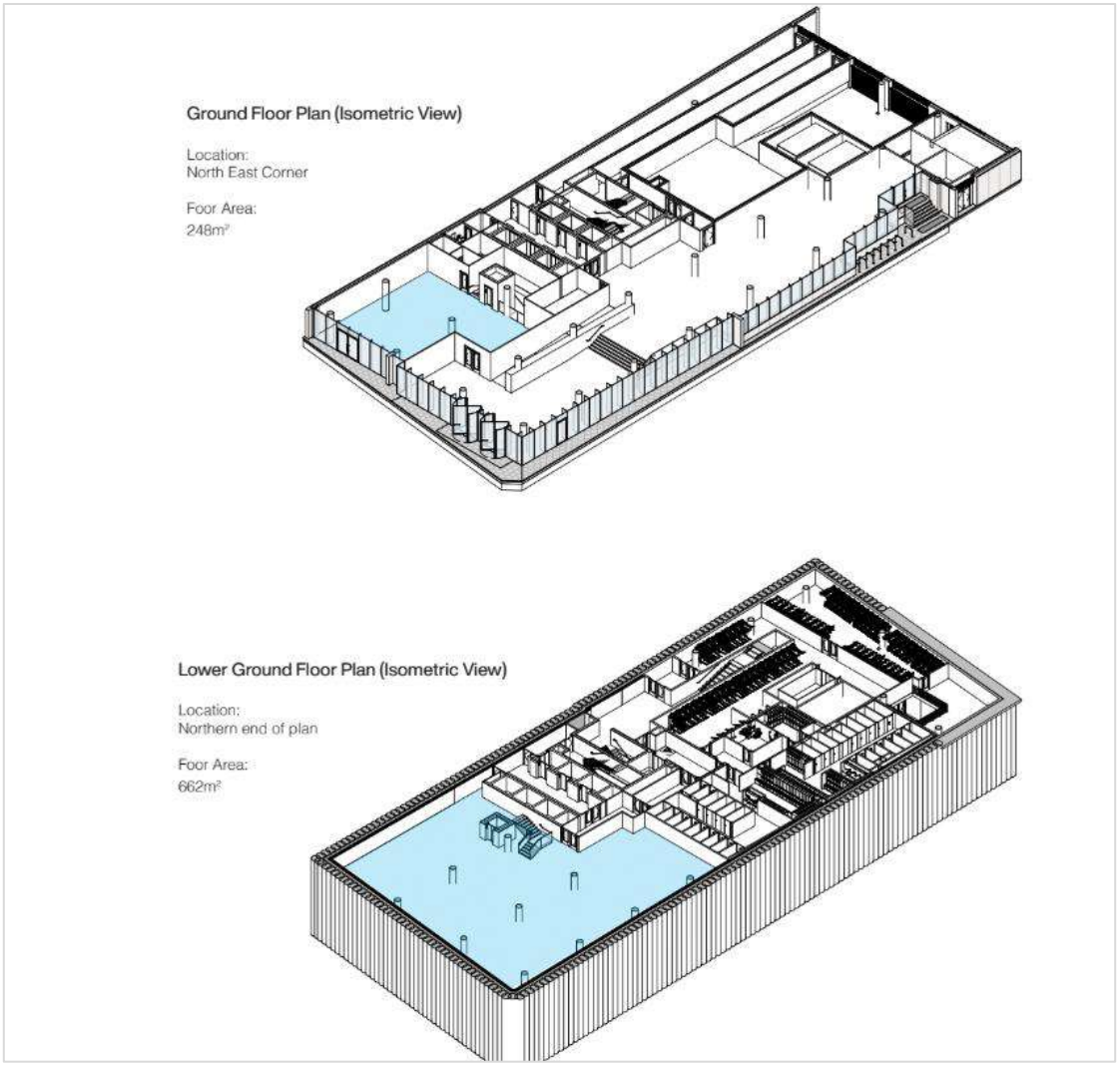
2.3.3 Arts and Cultural Spaces

New arts and cultural spaces are proposed at ground and lower ground floor levels and will deliver a creative core at the entrance to the building. The arts and cultural spaces will occupy two floors at the front of the building; ground floor and lower ground floor levels encompassing a total of 910 sqm. The welcoming frontage onto City Quay will encourage the public to visit these spaces in the building.

The lower ground floor level will solely be used for exhibition//workshop space for local artists. Part of the ground floor of the proposed development will provide for exhibition and public space.

The main entrance to the ground floor, located in the north-east corner of the site off City Quay is set back from the site boundary to form a small plaza. Externally a bench aligned with the undercroft of the second floor provides a waiting place close to the entrance. There will be a large double door on the City Quay frontage to allow for large scale art works to be moved in and out.

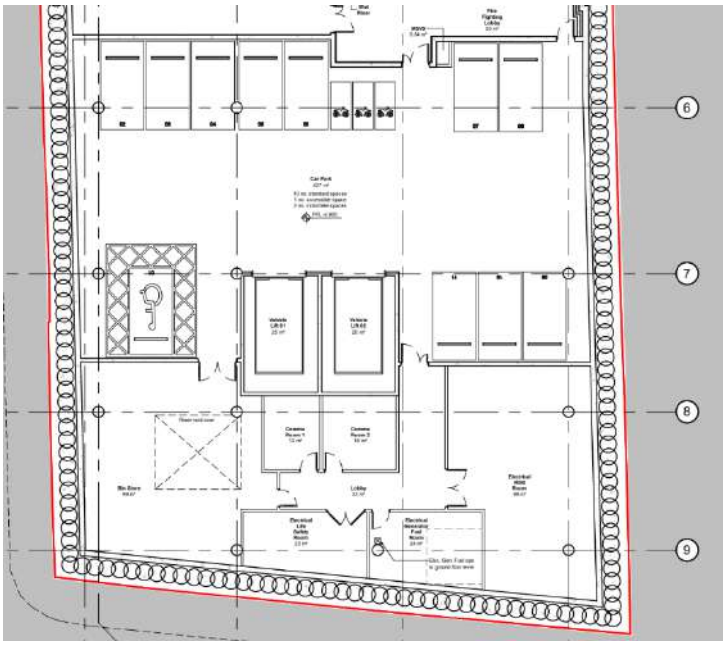
Figure 2.3. Proposed Arts and Cultural Uses



2.3.4 Parking Provision

The development shall include a total of 11no. car parking spaces (including 6 no. car share spaces and 1 no. accessible spaces), all located internally at basement level -1. 6 of the total 11 spaces will be equipped with EV charging facilities. 3 no. motorcycle spaces are also provided at basement level -1.

Figure 2.4. Vehicle parking provision at basement level -1



The development shall include a total of 330 no. bicycle parking spaces, comprising:

- 314 no. long-term bicycle parking spaces for employees, located in a secure dedicated bicycle store at Lower Ground Level; and
- 16 no. publicly accessible short-stay bicycle parking spaces for visitors, in the form of Sheffield stands at surface level within the public realm along Moss Street.

Figure 2.5. Bicycle parking provision at Lower Ground Floor Level

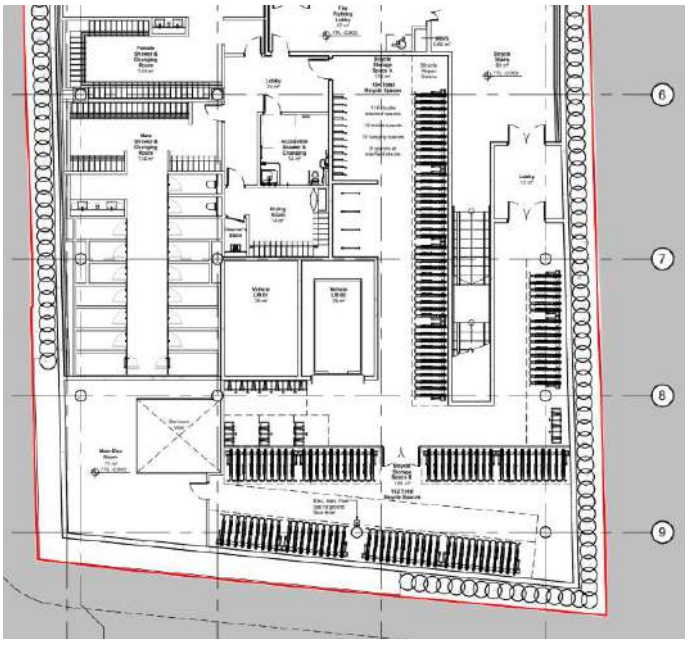
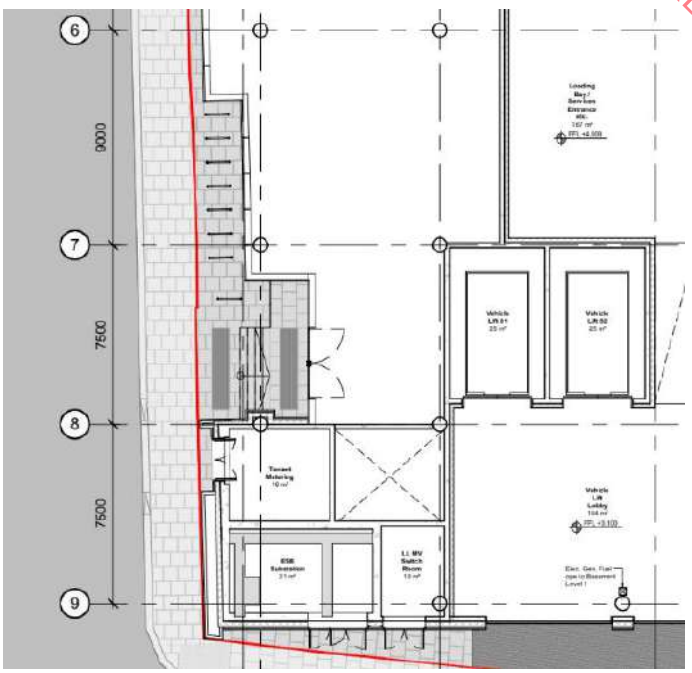


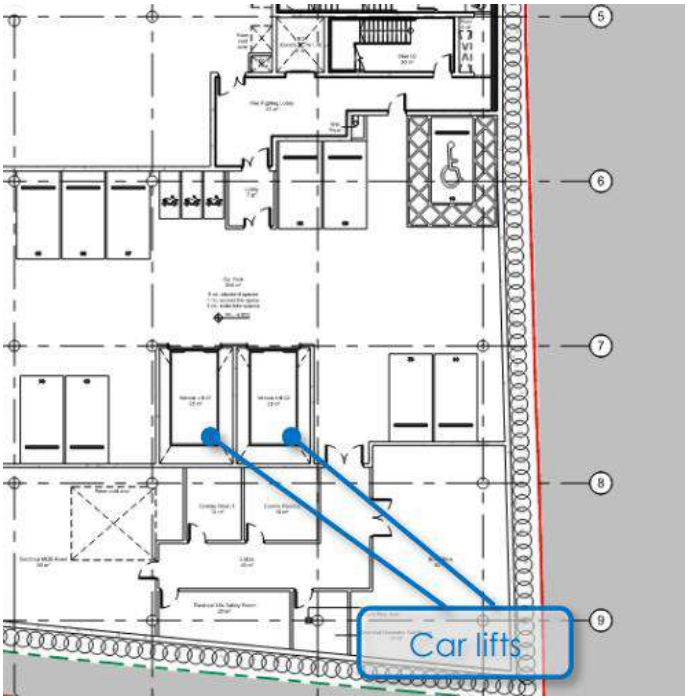
Figure 2.6. Bicycle parking provision at Ground Floor Level



2.3.5 Vehicular Access

As noted above, the proposed car parking spaces are located at basement level B1. This is accessed via 2no. car lifts, which are accessed at ground floor level from Gloucester Street South, at the sites' southern boundary. Given the development's limited internal car parking provision of 11 no. spaces, the provision of 2 no. car lifts will ensure that all incoming vehicles are able to gain access rapidly, which will reduce the risk of queueing on the public street. The lifts are set back within the building, allowing space for any vehicles waiting for a lift to do so within the site curtilage and to avoid obstructing the footpath or carriageway on Gloucester Street South. At basement level B1, the proposed car parking spaces are arranged perpendicularly to either side of a short access aisle 6.0m in width. The internal layout allows sufficient space for car parking manoeuvres, as well as dwell space for any cars waiting to access a lift for exit.

Figure 2.7. Location of car lifts



2.3.6 Landscaping Strategy

The majority of the proposed landscaping is hardscaped landscaping given the proposed development is not required to provide any public open space on site. New hardscaping will be provided within the site boundary at ground floor level. All access routes have been designed in accordance with Section 1.1.3.3 of TGD M 2010 to provide compliant gentle slopes across the public realm with level landings where required.

4 no. landscaped amenity terraces are proposed to serve the office development at 6th, 9th, 11th and 12th floor levels. The general concept of the amenity terraces design has been to capture and boost access to nature in the built environment and invite the people to appreciate outdoor environment provided within the building The key design principles of the amenity terraces are and green roof:

- Maximize usable outdoor space
- Provide flexible, distinctive and attractive outdoor spaces for all users to enjoy.
- Use lightweight materials and plant medium
- Provide ecological enhancements

Figure 2.8. Proposed public realm works along City Quay (subject to agreement with DCC)

Figure 2.9. Proposed amenity terraces

Further details are provided in the landscape drawings and the Landscape Design Report prepared by Cameo and submitted as part of this planning application.

2.3.7 Green Roof

576 sq.m. of green roof is provided at roof level. The green roof is planted with a biodiverse mix of native wildflowers and grasses, chosen for their ability to thrive in rooftop conditions and attract pollinators such as bees and small insects. The river washed stone margin around the perimeter serves multiple purposes: it provides a habitat for ground-nesting insects, aids in drainage, and creates fire break.

2.3.8 Surface Water and Drainage Strategy

All surface water run-off from the proposed development shall be controlled during intense rainfall events by means of green/blue roofs located at roof level, attenuation storage system located at the basement level -2 and associated flow control device which shall limit surface water run-off from the proposed development toa maximum of 2.0l/sec. The surface water from these attenuation systems shall be discharged into the proposed last manhole located within the proposed development extents.

The combination of surface water and foul effluent from the proposed development shall ultimately discharged into the existing 225mm diameter combined sewer along Moss Street.

Please refer to CS Consulting Engineers drawings Nos.V101-CSC-XX-GF-DR-C-0007, V101-CSC-XX-GF-DR-C-0008, V101-CSC-XX-B1-DR-C-0009andV101-CSC-XX-B2-DR-C-0010 for further details regarding the surface water drainage arrangements for the proposed development.

2.3.9 Foul Drainage Arrangement and Outfall

It is proposed to discharge the foul effluent generated by upper floors via gravity to the existing combined sewer along Moss Street to the west of the development site. It is proposed to provide a pumping station with 24-hour storage at the basement level (-2 level) to pump any foul effluent generated at the basement levels. The foul effluent shall pass through a petrol interceptor before being pumped to a standoff manhole at surface level and ultimately discharge into the existing combined sewer on Moss Street.

Please refer to CS Consulting Engineers drawings nos. V101-CSC-XX-GF-DR-C-0007, V101-CSC-XX-GFDR-C-0008, V101-CSC-XX-B1-DR-C-0009 and V101-CSC-XX-B2-DR-C-0010 for further details regarding the foul drainage arrangements for the proposed development.

2.3.10 Proposed Water Supply Arrangements

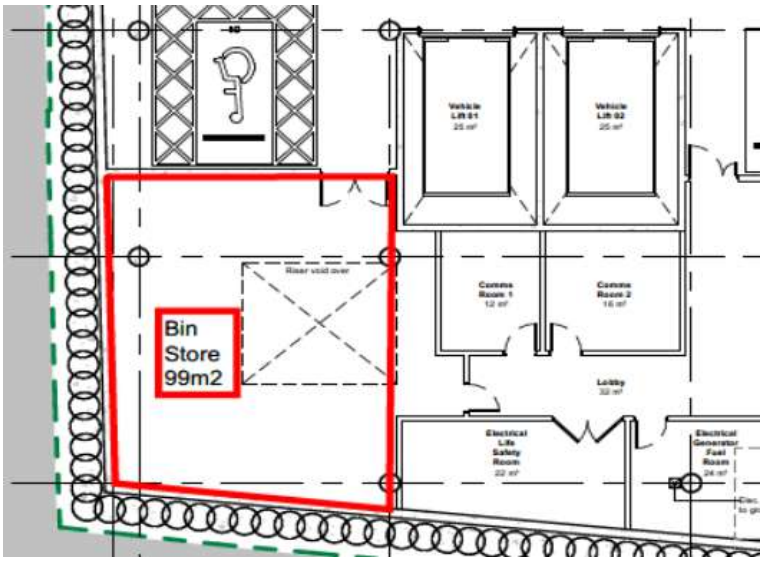
It is proposed to tie into the existing 250mm ductile iron watermain along Moss Street via a new 100mm watermain for the proposed development. Please refer to CS Consulting Engineers drawings nos. V101-CSC-XX-GF-DR-C-0011 for further details regarding the water supply arrangements for the proposed development

2.3.11 Waste Storage

The waste storage area is located at the basement level (level -1) along the south-western corner of the property. The waste storage area has been designed to ensure there is excess capacity for waste storage based on the maximum volume of waste that has been calculated to be generated by the development at full occupancy.

Prior to collection by a licensed waste contractor the bins/bales of segregated waste/recyclables will be conveyed by the waste contractor or facilities management via the car lift to a designated waste staging are at ground level. From ground level the bins will be collected/emptied on Gloucester Street South. Further information is provided in the Operational Waste Management Plan (OWMP) prepared by Byrne Environmental submitted as part of this planning application.

Figure 2.10. Proposed bin store



2.4 DESCRIPTION OF THE MAIN CHARACTERISTICS OF THE DEMOLITION AND CONSTRUCTION PHASES

2.4.1 Introduction

The development of the lands will occur for up to 10 years having regard to the nature of the project and the need for flexibility to respond to market demand. The anticipated duration of construction within the 10 years is envisaged to be approximately 30 months. An Outline Construction Environmental Management Plan (OCEMP) has been prepared by CS Consulting Engineers and is included with this application. The OCEMP will be developed and

submitted to Dublin City Council prior to commencement of development and will include the mitigation measures set out in this EIA Report and to comply with any relevant conditions attached to a grant of permission.

This EIA Report 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.

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 EIA Report will ensure that an extension to the construction period will not have a negative impact on the receiving environment.

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

2.4.2 Demolition Works

The initial phase of the proposed development will comprise the demolition and removal of the buildings in the north-west corner, the shed along the western perimeter, all hard surfaces and underground infrastructure, and the removal, storage and re-use of the Pooley Weighbridge. As noted in the development description above, the structures or part thereof may be demolished in compliance with a Dangerous Buildings Notice prior to a decision being made on this planning application.

The existing buildings are constructed mainly from blockwork and bricks, timber framing and a mixture of slate and flat concrete/asphalt roofing. The shed is constructed mainly from blockwork and roofing sheets. An archaeological assessment of the site and heritage appraisal of the buildings the has been prepared by Irish Archaeology Consultancy (IAC) as part of Chapter 10.

Once the subject lands are cleared of all existing structures the construction phase will proceed, commencing with underground structures (excavation and installation of basement, water, sewerage infrastructure etc.) followed by above ground works (building, power and telecoms infrastructure, surface water drainage, site profiling, landscape etc.)

Byrne Environmental have also prepared an outline Resource and Waste Management Plan (RWMP) that is included with the application documentation. The plan has been prepared in line with 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects', published by the EPA in 2021.The plan includes a provision for the management of all construction and demolition waste arising on site, and shall make provision for the recovery or disposal of this waste to authorized facilities by authorised collectors. The primary objective of this outline plan is to achieve more sustainable waste management practices through increased recycling, use of source separation and use of industry code to regulate collection and treatment of waste.

2.4.3 Construction Environmental Management Plan (CEMP)

The Contractor's CEMP will implement the measures contained in this EIAR and the OCEMP (included with the application). The OCEMP presents the approach and application of environmental management and mitigation for the construction phase of the proposed Project. It aims to ensure that adverse effects from the construction phase of the proposed Project, on the environment are avoided or minimised. It broadly replicates the construction stage mitigation included in Chapters 4-14 of this EIAR and as summarised in Chapter 15.

Post planning, the appointed contractor will take ownership of the Outline Construction Environmental Management Plan (OCEMP). Prior to any demolition, excavation or construction, the OCEMP will be updated by the successful contractor. The CEMP will set out the Contractor's overall management and administration of the construction project.

The Contractor's CEMP will:

- Be maintained and the procedures implemented by the contractor for the duration of the construction period.
- Manage all polluting activities likely to occur on site and include emergency response plans for environmental incidents e.g. hydrocarbon spillages.
- Detail measures to be carried out to avoid environmental incidents,

- Detail reporting procedures to be followed if incidents occur including details of responsible person in the construction team.
- Include details of training for all site personnel in the implementation of these procedures as part of the site induction process.
- Dangerous substances, such as oils, fuels etc., will be stored in a bunded zone. Emergency contact numbers for the Local Authority Environment Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the site compound. These agencies will be notified immediately in the event of a pollution incident.

In addition to the EIA Report mitigation measures already included in the OCEMP (and mitigation contained in this EIA Report and the Altemar NIS), the Contractor will be required to include additional details under the following headings:

- Working hours and days;
- Emergency planning - in the event of a fire, chemical spillage, cement spillage, collapse of structures or failure of equipment or road traffic incident within an area of traffic management. The plan must include contact names and telephone numbers for Local Authority (all sections/departments); Ambulance; Gardaí and Fire Services;
- Details of chemical/fuel storage areas (including location and bunding to contain runoff of spillages and leakages);
- Details of construction plant storage, temporary offices and site security arrangements, measures will need to be identified in relation to security of the various sites during construction e.g. controlled access onto site, measures to secure rear gardens, access, etc;
- Truck wheel wash details (including measures to reduce and treat runoff);
- Dust management to prevent nuisance (demolition and construction);
- Site run-off management;
- Noise and vibration management to prevent nuisance (demolition and construction), Work practices, equipment noise control and screening shall be in compliance with BS 5228- 1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (together referred to as B.S. 5228);
- Landscape management.

2.4.4 Hoarding

The site area shall be enclosed with hoarding, details of which are to be agreed with Dublin City Council. Hoarding panels shall be maintained and kept clean for the duration of the project.

2.4.5 Site Access Routes

Construction vehicles attending the site will be required to use the network of one-way streets in the local area. Due to the direction of traffic flow, City Quay itself to an ingress point with the flow of traffic in one direction only. Vehicular entrance and exit gates have been installed in this section of hoarding. An existing vehicular access to the site is located on City Quay, at its northern boundary. This will serve for all demolition, clearance, piling, and excavation works on the site. It is proposed to provide a new construction vehicular access along Gloucester Street South, at the site's southern boundary for the duration of further construction works. Security personnel will be present at the entrance/exit of the site to ensure all exiting traffic will do so safely. A self-contained wheel wash system (see sub-section 4.3) will be installed at the exit from the site, to minimise dirt being carried out into the public road, and a road sweeper will be employed as required to keep public roads around the site clean.

2.4.6 Construction Traffic

The Contractor shall establish a Construction Traffic Management Plan (CTMP) for the construction works.

The CTMP shall:

- Address the movement of vehicles, machinery, and pedestrians within the site boundary and on adjacent public roads & footpaths
- Ensure that the safety of construction operatives, public road users and pedestrians is not compromised as a consequence of the works.

This shall be achieved through the effective implementation of traffic mitigation measures. When considering mitigation measures, the Contractor shall pay particular attention to sensitive and vulnerable users (e.g. children, elderly etc) and take account of stakeholders whose activities may be affected by the proposed works (e.g. local schools, residents, businesses etc).

Among the traffic management measures to be included in the CTMP are:

- Securely fencing off the site from adjacent properties, public footpaths and roads during the pre-construction phase.
- Providing signage on the surrounding road network to define the access and egress routes for the development.
- Strictly controlling the traffic generated by the construction phase of the development in order to minimise the impact of this traffic on the surrounding road network.
- Adequately signposting and enclosing all road works to ensure the safety of all road users and construction personnel.
- Accommodating all unavoidable personnel and visitor vehicle parking demands onsite or within designated off-site parking areas.
- Implementing a programme of street cleaning as required.
- Making arrangements to facilitate the delivery of abnormal loads to the site.
- Implementing measures to avoid queuing of construction traffic on the adjoining road network.

The following specific traffic control and marshalling measures are to be included in the CTMP, to minimise the potential for obstruction of surrounding streets:

- At no time will construction associated vehicles be stopped or parked along haulage routes.
- Haulage vehicles will not travel in convoys of greater than two vehicles at any time.
- Haulage vehicles will be spaced by a minimum of 250m at all times.
- At no time will haulage vehicles be parked or stopped at the entrance to the site.
- All loading of excess material will occur within the site boundary.
- All off-loading of deliveries will take place within the site, away from the public road and will access via the construction site access

2.4.7 Construction Parking

Due to the site's city centre location and constrained nature, no car parking is to be provided on or near the site for construction personnel or for visitors. Construction personnel will be encouraged to walk, cycle, or use public transport, and information on local transport services will be published on site.

2.4.8 Excavation

This development will involve excavation and removal of material from site for foundations, and regrading of the site profile. It is not envisaged that rock will be encountered during the excavation works.

The appointed Contractor will engage with the project archaeologist prior to the commencement of excavation on site. Excavation will be carried out under the supervision of the project archaeologist.

The Contractor must prepare a Construction & Environmental Management Plan in accordance with the Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (Department of Environment, Heritage and Local Government, 2006). The Contractor must also outline detailed proposals within the Construction & Environmental Management Plan to accommodate construction traffic.

2.4.9 Construction Building

Following on from demolition, site clearance and excavations, foundations shall be laid, and the external buildings envelope and roof constructed. The building frames shall most likely consist of load bearing masonry walls with reinforced concrete cores. Floors shall likely be constructed using hollow core precast slabs overlaid with structural screed but with some localised elements of reinforced concrete slabs are also likely for transfer slabs. Works to the façade shall commence following partial completion of the external envelope. Once the buildings are weather sealed, the internal fit out and completion works shall take place. This shall be followed by mechanical and electrical fit-out, general fit-out and then final commissioning.

2.4.10 Superstructure

The construction of the superstructure shall involve a coordinated sequencing of activities, and various construction methodologies could be adopted to deliver the Contract. As noted, the construction methodology and therefore the programme of the construction activities will be dictated by the Contractor. The following outlines a general construction sequence for the superstructure.

Buildings Structure:

- Installation of any temporary works which needs to be verified as part of detail design.
- Demolition of existing building and hardstanding area.
- Site clearance including install/removal of below-ground services.
- Excavation/fill and construction of the foundations, to support the new vertical structure. • Stripping old finishes.
- Construction of the new ground-floor slabs.
- Construction of walls, columns, beams and floors slab for the new build extensions at the end of each block. This will be constructed in a sequential manner with the proper integration with the existing adjacent structure.
- Construction of the steel frames and slabs of the additional floors on top of the existing structure and the extensions.
- Building the balcony and walkway frames and slabs on new foundations and tying them to existing columns and walls.

Envelop/Cladding:

- Commencement of envelope works to ground floor when structure has progressed to approximately Level 2/3, with suitable temporary openings in the façade left for ease of transport of construction material.
- Advancing of external leaf two or three levels behind the structure.

Mechanical & Electrical fit-out

- First fix will commence at each level behind structure.
- This will be followed by the second fix and the final connections.

General fit-out:

- Initial installation of stud work when cladding is complete, and floor is weather tight. • Installation of equipment and associated connection to services.

Commissioning:

- The final commissioning period will commence during fit-out.

The above is an indicative construction sequence. The final sequence will be dictated by the Contractor. The Contractor must issue a detailed construction programme outlining the various stages prior to commencement of works.

2.4.11 Construction Programme and Phasing

Subject to a successful grant of planning, it is intended for the works to commence in Q1 or Q2 of 2026. The proposed development is anticipated to be constructed over a 30-month period approximately.

The development is proposed to be constructed in accordance with the following indicative sequence of works:

- Reduced level excavation
- Foundation construction
- Site services installations (drainage, power, water)
- Building frame and envelope construction
- Interior and exterior landscaping

2.5 DESCRIPTION OF THE MAIN CHARACTERISTICS OF THE OPERATION OF THE PROJECT

2.5.1 Site Utilities and Infrastructure

Energy During the Operational Phase

Once in operation, electricity will be provided to the site via the national grid tying in with existing infrastructure in neighbouring areas.

The building will be served by two electricity sub-stations accessed from Gloucester Street South. This will be carried out in accordance with the requirements of the various service providers.

There is no gas supply connection required for the proposed development due to the use of renewable technologies as the primary energy source.

Telecommunications During the Operational Phase

There are telecommunication lines in existence for telephone and broadband services in the area. A fibre optic cable distribution network will be installed with a separate incoming fibre infrastructure and provided to the proposed building via underground fibre ducts. There are existing underground carrier ducts adjacent to the site that will be utilised for the development.

2.5.2 Sustainability Energy Efficiency and Resources Use

A “Climate Action and Energy Report” and a preliminary “Part L Compliance and Building Energy Rating Report” have been prepared by Penston MEP Consulting and are submitted as part of this application. The later report demonstrates that NZEB (Nearly Zero Energy Building standard) compliance and A1 building energy rating can be achieved for the proposed development.

2.5.3 Waste Management

An Operational Waste Management Plan (OWMP) has been preprepared by Byrne Environmental consulting and is submitted as part of this planning application. The OWMP outlines the principles and measures by which the waste generated during the operational phase of the proposed development will be managed and disposed of in compliance with the provisions of the Waste Management Acts 1996 to 2013 and the Eastern Midlands Region (EMR) Waste

Management Plan 2015-2021. It describes the measures by which optimum levels of waste reduction, re-use and recycling shall be achieved.

2.5.4 Microclimate/Wind Assessment

A Wind Microclimate assessment report has been prepared by BPC to accompany this planning application. This report demonstrates that the wind conditions surrounding the proposed development will generally be suitable for pedestrians. The majority of the areas at ground level (adjacent public footpaths and streets) experience wind conditions that meet the Lawson 'Strolling' criteria or better. There are some areas at ground level that meet the Lawson 'Business Walking' criteria, however these are mainly confined to the road and as such shouldn't impact pedestrians significantly.

2.5.5 Daylight/Sunlight Access

A daylight/ sunlight assessment was prepared by 3D Design Bureau to accompany this application which concluded that there will be a minor reduction to the daylight availability to the directly adjacent buildings however this is broadly in line with the possible reduction of a building similar in massing to the surrounding buildings.

The level of effect to all residential properties within the area have all been categorised as 'negligible' and 'minor adverse'. While the levels of effect to the commercial premises vary, these have been clearly identified and rationalised within the daylight/ sunlight assessment.

2.5.6 Aviation Considerations

An Aeronautical Assessment Report has been prepared by O'Dwyer & Jones Design Partnerships and is submitted as part of this planning application. The report considers that the proposed development complies fully with all aviation and aeronautical considerations and requirements affecting the site.

2.6 DESCRIPTION OF OTHER RELATED/CUMULATIVE PROJECTS

2.6.1 Related Development

It is stated in the Guidelines on the information to be contained in Environmental Impact Assessment Reports, EPA May 2022 that related development includes *"other projects (sometimes by other developers and sometimes off site) or individual project components which occur as a direct result of the main project, such as a power line, a substation or a road junction upgrade which may result in significant effects." (section 3.5.7, page 40)*

There are no proposed related developments (either offsite or secondary[1]) associated with the proposed development. Any future application on these development lands will be subject to planning approval and environmental assessment as required. Any new development proposed on the lands after the submission of the proposed development would be accompanied by an EIA, or EIA Screening as required and take into consideration the development of this site.

2.6.2 Cumulative Development

The Guidelines on the information to be contained in Environmental Impact Assessment Reports, EPA May 2022 states that cumulative effects are *"the addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.*

While a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or insignificant), result in a cumulative impact that is collectively significant. For example, effects on traffic due to an individual industrial project may be acceptable; however, it may be necessary to assess the cumulative effects taking account of traffic generated by other permitted or planned projects. It can also be prudent to have regard to the likely future environmental loadings arising from the development of zoned lands in the immediate environs of the proposed project." (section 3.7.3 page 57)

[1] Section 3.5.7 of The Guidelines on the information to be contained in Environmental Impact Assessment Reports, EPA May 2022 states that the description of other related projects can loosely be grouped under two headings: Off-site and Secondary Projects.

The impact of all existing developments within the zone of influence of the proposed development, including the activities currently permitted within the lands of the proposed development are already present within the environment and are described by the *existing* environmental baseline conditions.

The current baseline conditions are established primarily through a review of current desktop sources, augmented where necessary via independent surveys. Any statements contained within this report as to the likely impact of the proposed development upon the environment are by default also a statement as to the likely accumulation of impacts arising from the proposed development with those impacts already in *existence*.

As part of the assessment of the impact of the proposed development, account has also been taken of cumulative projects in this EIAR, i.e. developments that are currently permitted or under construction within the surrounding area, but whose environmental impact are not yet fully realised within the existing environmental baseline. The potential for cumulative impacts arising from these other cumulative projects has been addressed within each specialist chapter of this EIA Report.

The subject lands and surrounding lands provide good potential for delivering high density office and residential uses. The proposed development represents one of many opportunities that have been and are being constructed to realise this potential.

2.6.3 Developed Cumulative Developments

Block B, Georges Quay (Planning reference: 2532/20)

Granted final permission Dec 2020, planning permission for development on a site of 0.14ha at Block B, Georges Quay, Dublin 2, D02 VR98. The site is bound by Georges Quay to the north, Georges Quay Plaza to the south, 1GQ to the east and Tara Street Station/Railway bridge to the west. Luke Street runs through the site in a north/south direction with the existing building bridging across Luke Street from 1st floor level. The proposed development comprises of the following:

- Refurbishment of the existing 5 no. storey building to provide for a new façade treatment to all elevations.
- Extension of existing 5th storey set back level in line with the main façade along the northern elevation.
- Provision of 2 no. additional floors (2,627 sq.m), set back from the north, east and west elevations.
- Provision of a café unit (302 sq.m.) to the west side of the building fronting Georges Quay and Luke Street to the east at ground at mezzanine level
- Amendments to the ground floor layout to provide for a new entrance lobby to the office to the east of the building.
- Amendments to basement level to provide for a reconfiguration of the car parking spaces, 80 no. cycle parking spaces, 3 no. motorbike spaces, new shower and locker rooms, staff amenities, bin store, managers office and plant room. Access to basement will remain unchanged.
- Alterations to the hard and soft landscaping, SUDs drainage provision of plant at basement and roof level, 2 no. accessible terraces at 5th and 6th floor to the north, east and west, green roofs and all other associates site development works necessary to facilitate the development works necessary to facilitate the development.

2.6.4 Cumulative Developments (Permitted – not yet constructed/under construction)

Shaw Street (Planning Ref. 4826/19)

Granted Dec 2020 for the demolition of existing property known as No. 2 Brunswick Villas, including existing boundary walls and gateway entrance to Shaw Street and the construction of a new 12 No. apartment development comprising of; 11 No. 1 bedroom units and 1 No. 2 bedroom unit in a mixture of three and six storey buildings. The development will include internal courtyard to rear, new gateway to the existing Brunswick Villas laneway and entrance lobby, plant rooms and bicycle storage areas at ground floor level. All apartments will include balconies to street elevations from first to fifth floors, with setback balconies and balustrades included to fifth floor apartment area. The proposed works are to include all associated site works, ancillary accommodation and drainage at the site.

The demolition/construction phase of these four cumulative developments are captured within the current existing environmental baseline for the area surrounding the subject lands. As they are already constructed, or their construction will be complete prior to the construction phase for the proposed development they will not contribute any potential increase in cumulative impacts associated with the proposed development demolition and construction phase. As such the assessment within this EIA Report does not consider the likelihood of environmental impacts associated with the cumulative demolition and construction phases of the proposed development and these two already constructed developments.

This EIA Report however does consider the likelihood for cumulative impacts associated with the operational phase of the proposed development and the above already/nearly constructed developments. The likely operational impacts to the environment arising from these four constructed/nearly constructed developments have been identified by a review of the planning documents associated with each of these four cumulative developments.

Townsend Street (Planning Re. 2877/21)

Planning permission was granted in November 2021 for amendments to a permitted development under Reg. Ref.: 4778/19 at a site (0.2695 ha). The permitted development includes construction over the rail line which traverses the site and also within the vaulted foundations supporting the rail line. The proposed development consists of the following:

- Amendments to the footprint of the basement and layout of the ground floor level. There is also a slight reduction in the floor area from 1st – 8th floor due to the proposed amendments.
- The basement level in Plot A will increase by 235.3 sqm to provide a total overall basement gross floor area of 1,340 sqm providing retail and office uses.
- The basement floor level in Plot B will be lowered from -4.2 to -5.25m.
- The amendments at ground floor level include general layout changes, new revolving door and glazed screen to office reception on Townsend Street; change of use of permitted office unit (355 sqm) at ground floor level fronting Brunswick Villas retail/café/restaurant use; the provision of a new entrance lobby to access basement level and associated elevational changes; revisions to bicycle parking and refuse area to provide additional retail floor space and; minor elevational changes to ESB substation fronting Garden Lane.
- Proposed revisions to Shaw Street elevation at 6th floor and the provision of an additional terrace access door.
- Additional plant at roof level over 8th floor providing for a slight increase of 1.75m to the overall building height.
- The proposed amendments result in an additional 969.6 sqm of retail/café/restaurant space and a minor increase in overall development GFA by 285.3 sqm to a total 15,400 sqm.
- And all ancillary and associated works, including elevational works.

La Touche House (Planning Ref. 3315/22)

Planning permission granted in August 2022 for development at a c. 0.4417 ha site at La Touche House, Custom House Dock, International Financial Services Centre, Dublin 1. The proposed development will consist of; the refurbishment/reconfiguration, partial demolition, recladding and vertical extension of an existing (c. 13,275.9 sq.m GFA) 7-storey building to a 10-storey (c. 23,314.3 sq.m GFA) office building with an additional c. 8,068.4 sq.m commercial floorspace provided and a total height of c. 45.84 m from ground (50.85m ODM), including the following:

- Partial demolition of the existing fifth floor and the existing sixth floor plant rooms and external plant areas to fifth floor slab level, comprising a combined area of c. 1528.5sq.m removed, the removal of an existing bridge link across the atrium, and maintaining the existing c. 565.1 sq.m of office space and the existing core areas to the east, west and south;
- Refurbishment and reconfiguration of the existing office building as follows:-
- Basement level: Reduction in car parking provision from 143 no. to 99 no. retained spaces, reconfiguration of existing plant areas, increased bicycle parking to 184 no. spaces, provision of bicycle storage areas, locker room, changing rooms, staff toilets and drying room, bin storage area, new staircase link, bicycle lift and service lift from podium (ground floor level) covering an additional area of c.913.2 sq.m within the existing basement;

- Ground Floor: Reconfiguration of the existing ground floor to include a new glazed screen enclosure to the existing atrium and introduce a new building entrance to the south elevation accessed from IFSC Plaza and close the existing entrance. Change of use of 103 sq.m of part of an existing retail bank area to office use. Change of use of c. 134.9 sq.m existing office space to a c. 152.1 sq.m food & beverage unit including an extended area of c. 17.2 sq.m to the east and access to an external terrace to the east. Change of use of c. 128.2 sq.m existing office space to a c. 164 sq.m bicycle café including an extended area of c. 35.8 sq.m to the south and east. Reconfiguration of the existing ground floor to the south/south- west to include a change of use from existing office area to create 2 no. food & beverage/retail units of c. 94.1 sq.m and c. 44 sq.m respectively;
- First Floor, Second Floor and Third Floor: Reconfiguration of the existing office floors to include refurbished and extended toilet accommodation; extension of the office accommodation to the edge of a new glazed screen enclosure to the existing atrium;
- Fourth Floor: Reconfiguration of the existing office floors to include refurbished and extended toilet accommodation; extension of the office accommodation to the edge of a new glazed screen enclosure to the existing atrium and enclosure of 2 no. external balcony areas to provide an additional c. 86.6 sq.m office space;
- Fifth Floor: New office floor accommodation to replace the existing plant areas and the enclosure of the existing external terrace to the north of the office floor (c. 1,226 sq.m) and to include the existing c. 565.1 sq.m of office accommodation to the north of the new extended floorplate, reconfiguration of existing plant areas to unisex toilets, lift lobby and circulation space within core area to the south;
- Addition of new floors: Addition of 4 no. office floors with the existing stair cores extended upwards and toilet accommodation replicated as the supplemented existing provision on the lower floors and the existing atrium extended through to roof level; the proposed sixth, seventh and eighth floor levels will consist of c. 1,791.1 sq.m office space each; the proposed ninth floor level will consist of c. 1,329.5 sq.m office space; setback of the external envelope and creation of a terrace area accessible for maintenance only at ninth floor level; new Part M compliant accommodation stairs within the atrium from ground floor to ninth floor;
- External works to include; A complete recladding with replacement curtain walling and an over-wrapping by a translucent perforated metal veil to the vertical external envelope of the existing building from ground floor level to fifth floor level and the extension and continuation of a new curtain wall and external perforated veil above to include the newly reconstructed fifth floor, and the new sixth, seventh. eighth and ninth floors; new plant and plant enclosure screen at roof level; additional plant on perforated metal platforms adjacent to the 3 no. existing cores from first to ninth floor; the provision of photovoltaic panels at roof level; new glazed atrium roof; provision of 4 no standard bicycle spaces and 9 no. cargo bicycle spaces at ground level; provision of a platform lift on the north-east corner of the site; new hard and soft landscaping adjacent to the building only; new lighting; and all associated site development works.

Dublin Arch (Planning Ref. 3054/22)

Planning permission August 2022 in for a proposed mixed-use development, 'Dublin Arch', on a site (2.86 ha) adjacent to Connolly Station, Sheriff Street Lower, Dublin 1, D01 V6V6. The proposed development relates to work to a Protected Structure (RPS Ref. No. 130). The development will consist of:

- (The construction of 4 no. office blocks (B1, B2, B3 and B4) 12 to 16 storeys in height including landscaped areas in the form of gardens at podium level and landscaped terraces at upper levels (combined 3,365 sq.m) with a cumulative gross floor area of 52,509 sq.m comprising of:
    - a) Block B1 (max. building height 58.725 m, total gross internal floor area 11,860 sq.m of office);
    - b) Block B2 (max. building height 58.725 m, total gross internal floor area 11,902 sq.m of office);
    - c) Block B3 (max. building height 54.725 m, total gross internal floor area 10,147 sq.m of office);
    - d) Block B4 (max. building height 69.925 m, total gross internal floor area 18,600 sq.m)
- The construction of 187 no. Built-to-Rent (BTR) apartments and associated supporting tenant support facilities, services and amenities in 2 no. blocks (C and D1/D2) with a cumulative gross floor area of 19,836 sq.m;
    - a) Block C (6,522 sq.m) comprising 62 apartments (10 no. studio; 14 no. 1-bed; 35 no. 2-bed and 3 no. 3-bed units) in a block 5 to 11 storeys in height (max. building height 39.5 m) and supporting tenant facilities and amenities (combined 68 sq.m);

    - b) Block D1/D2 (13,314 sq.m) comprising 125 apartments (40 no. studio; 30 no. 1-bed; and 55 no. 2-bed) in a block 5 to 15 storeys in height (max. building height 53.392 m) and supporting tenant facilities and amenities (combined 420 sq.m);
- Residential communal amenity open space across Block C and D1/D2 in the form of courtyards and landscaped terraces at upper floor levels (combined 2,695 sq.m) and other private open spaces;
- 7,380 sq.m of public open space (5,930 sq.m at street level, and 1,450 sq.m at upper level) including a central public plaza and other open spaces located throughout the development;
- two-storey covered car parking at ground level (the lowest level is +0.0 AOD) under blocks B2, B3, B4 and C of 7,027 sq.m with 206 no. car parking spaces;
- a total of 1,047 bicycle parking spaces distributed as follows:
    - a) 283 no. secure long-term bicycle parking spaces for residents and 96 no. secure short-term bicycle parking spaces for apartment visitors distributed across 2 no. bike storage rooms at street level in Block C and Block D1/D2;
    - b) 554 no. secure bicycle parking spaces to serve the office element of the development in 1 no. bike storage room at street level in Block B1; and
    - c) 114 no. bicycle parking spaces for public use at street level distributed across the development, including spaces within a covered bike hub;
- 4 no. retail units at street level (combined 468 sq.m) distributed in Block B4 (1 no. retail unit) Block C (1 no. retail unit) and Block D1/D2 (2 no. retail units), and 2 no. community units (combined 640 sq.m) at street level in Block D1/D2;
- modifications to a portion of a Protected Structure (RPS No. 130), specifically the wall fronting Oriel Street Upper to facilitate:
    - a) the development of a new pedestrian entrance to the site;
    - b) the development of a vehicular entrance to the proposed car parking area; and
    - c) the development of a service/ emergency vehicular access only ramp to serve CIE's transport needs at Connolly Station;
- decommissioning and removal of existing telecommunication masts and removal of all existing structures on site including portacabins and ancillary storage containers;
- the construction of 7 no. electricity substations, plant rooms, 4 no. waste storage area within the proposed blocks and car parking, and solar panels located on the roofs of proposed office blocks; and
- all ancillary site development works, including drainage, landscaping and lighting.

Due to the fact that the above permitted but not yet constructed developments have not been constructed their potential impacts are not captured within the current environmental baseline for either their demolition/construction phase or their operational phase.

The precise timeline for the construction of these three permitted but not yet constructed developments is not known and as such, for the purposes of this EIA Report the precautionary principle has been applied by assessing in this EIA Report the potential for cumulative construction impacts occurring in tandem with the proposed development. The likely demolition/construction impacts to the environment arising from these three permitted, but not yet constructed developments have been identified by a review of the planning documents associated with each of the permitted but not yet constructed development applications.

This EIA Report also considers the likelihood for cumulative impacts associated with the operational phase of the proposed development and the operational phase of these three permitted but not yet constructed developments. The likely operational impacts to the environment arising from these three permitted but not yet constructed developments have been identified by a review of the planning documents associated with each of the permitted but not yet constructed development applications.

2.6.5 Cumulative Developments (Proposed – not yet Permitted)

Grand Canal Square (Planning Ref. WEBDSDZ2286/24)

Permission sought on October 2024 for development at this site (c. 0.52 Ha), at 4-5 Grand Canal Square, Dublin 2, and otherwise bounded generally by Hibernian Road to the east, Misery Hill to the south, Cardiff Lane to the west, and 37-42 Sir John Rogerson's Quay to the north. The proposed development comprises:

- the refurbishment of an existing 6-7 storey office building for continued office use, including the following ancillary and associated works:
- Creation of c. 253 sq m additional gross floor office area resulting from the proposed alteration to the Cardiff Lane building entrance area and infilling of existing voids at mezzanine level;
- Insertion of a new public café space (c.80 sq m) within the ground floor lobby area inside the Misery Hill building entrance;
- Landscape enhancement works at Misery Hill, including planters, seating and associated hardscaping;
- Landscape enhancement works at Cardiff Lane, including demolition of the stepped entrance and terrace, to lower the existing building entrance to street level;
- New building entrance at Cardiff Lane, c.9m high, with 1no. new glass revolving door, 2no. single escape doors and bicycle ramp entrance to basement. Associated demolition and replacement of the existing curtain wall façade at Cardiff Lane entrance level with new selected cladding panels;
- Replacement of existing double door and curtain walling adjacent to the new Cardiff Lane entrance, to include lowered door level and installation of stepped landing; New lightwell to the basement at Cardiff Lane;
- Replacement of the existing curved façade at Misery hill with new façade to include 1no. recessed glass revolving door, 2no. single escape doors and 1no. double door, and new selected cladding panels;
- Replacement of 1no. existing single door with new double door entrance on the north building elevation;
- 2no. new single door entrances on the east building elevation and removal of external ground level vent, adjacent to Hibernian Road; Demolition and infill of existing skylight at Level 1;
- Replacement of the soffit aluminium cladding along Cardiff Lane, Hibernian Road and Misery Hill with new selected cladding panels;
- Construction of a new demountable flood defence system along Cardiff Lane; Reduction of existing basement car parking from 149no. spaces to 35no. spaces;
- Provision of 423no. bicycle spaces within reconfigured basement, 26no. bicycle spaces at ground level;
- Replacement of 5no. existing doors with similar and installation of soft and hard landscaping, including glazed screen, to existing level 6 terrace;
- Installation of new roof plant (2no. energy centres) and corresponding increase in plant screening by 1m in height. Associated relocation eastwards by c.1.5m of plant screening along the eastern edge of No.4 Grand Canal Square.

For the purposes of this EIAR the precautionary principle has been applied by assessing in this EIAR the potential for cumulative construction impacts of the above planned but not yet permitted developments. The likely demolition/construction impacts to the environment arising from these two planned but not yet permitted developments has been obtained through a review of the panning application documents.

This EIAR also considers the likelihood for cumulative impacts associated with the operational phase of the proposed development and the operational phase of these two planned but not yet permitted developments. The likely operational impacts to the environment arising from these two planned but not yet permitted developments has been identified by a review of the associated planning documents.

2.7 REFERENCES

- **Dublin City Council, 2022.** *Dublin City Development Plan 2022-2028.* Dublin City Council.
- **Environmental Protection Agency, 2022.** *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.* Environmental Protection Agency.

3.0 ALTERNATIVES

3.1 INTRODUCTION

The Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018) – states:

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

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

This section provides an outline of the main alternatives examined during the design phase. It sets out the main reasons for choosing the development as proposed, taking into account and providing a comparison on the environmental effects.

This section assesses the evolution of the proposed development and the alternatives examined by the Applicant relating to the location, size and scale and project design and technology of the proposed development. This section provides a full justification for the proposed development and provides a comparison of the environmental effects of each alternative option.

This section of the EIA Report has been prepared by John Spain Associates, Planning & Development Consultants, and provides details of the evolution of the scheme design through the reasonable alternatives examined. This chapter of the EIA Report was prepared by Blaine Cregan M.Sc. B.Sc (hons) and BEng., Executive Director with John Spain Associates, and approved by John Spain, Managing Director.

Blaine has acted as lead planning consultant on a range of high-quality complex planning applications across the country over an extended period. Blaine has wide-ranging experience in the management and review of Environmental Impact Assessment (EIA) Reports for major commercial and mixed-use development and redevelopment projects. Inputs to this chapter have also been provided by Henry J Lyons, CS Consulting Engineers, Byrne Environmental Consulting and PMEP Consulting Engineers.

It is 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*."

3.2 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 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 EIAR 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."[1]

Pursuant to Section 3.4.1 of the EPA EIAR 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 EIAR Guidelines 2022 are also instructive in stating:

"Analysis of high-level or sectoral strategic alternatives should not be expected within a project level EIAR… 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.

3.2.1 Alternative Locations

The application site is zoned for a mix of uses under the Dublin City Development Plan 2022-2028 (Z5 Zoning Objective – City Centre), and the proposed uses are permitted in principle with the land use zoning objectives pertaining to the project site.

The 2018 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 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 the uses proposed, it is not considered appropriate to evaluate alternative locations in the EIAR.

A "do-nothing" scenario was considered to represent an inappropriate, unsustainable, and inefficient use of these zoned lands; particularly having regard to the close proximity to a number of high-quality transport links in the city centre site. The suitability of the lands for development has been confirmed as it is located within an area identified for development under (Strategic Development Regeneration Area (SDRA) 6 – Docklands) under the Dublin City Development Plan 2022-2028.

[1] *Ref CJEU Case 461/17*

As noted in Section 4.13 of the 2018 Guidelines *"some projects may be site specific so the consideration of alternative sites may not be relevant."*

We also refer to the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2020), which states that in some instances alternative locations may not be applicable or available for a specific project which is identified for a specific location.

In the first instance, the proposed development is in accordance with the zoning and other relevant policies and objectives of the Dublin City Development Plan 2022-2028). The site is zoned as 'Zone Z5' – "*to consolidate and facilitate the development of the central area, and to identify, reinforce, strengthen and protect its civic design character and dignity".* The most recent use of the subject lands for car parking is included as a permissible use for Z5, however, the proposed development provides a more diverse mix of uses including office and arts and cultural spaces. Therefore, the proposed development represents a significant improvement in the alignment with the zoning objective of Z5 - City Centre.

The location of the proposed development was also chosen to complement the associated proximal developments as mentioned in Section 2.8 and other existing residential, commercial and amenity developments within the City Centre, the remainder of the Georges Quay area and the Dublin Docklands.

Furthermore, as identified in Chapter 11 of this EIA Report the current location for the proposed development is one is highly accessible in terms of provision of public transportation. It is an ideal location for the consolidation of employment opportunities for those residing within Dublin City centre and those living further afield enabling a significant switch to more sustainable modes of transportation.

Given the current zoning of the site, the surrounding land uses, the proximity to similar associated developments, the public transport connections, and the availability of necessary services and infrastructure, the current location of the proposed development is determined to be the most appropriate.

3.2.2 Alternative Uses

The subject site is zoned for a mix of uses which are compatible with the city centre location of the site. The subject site will provide new office accommodation and arts and cultural spaces. In addition to these uses there are other land uses which are permitted in principle on these lands such as residential and retail etc. See Table 3.1 below for full list of permissible uses under Z5 zoning objective.

Table 3.1. Z5 - Permissible Uses

Amusement/ leisure complex, Beauty/grooming services, Bed and breakfast, Buildings for the health, safety and welfare of the public, Café/tearoom, Childcare facility, Civic offices, Community facility, Conference centre, Craft centre/craft shop, Creative artistic, recreational building and uses, Cultural, Delicatessen, Education, Embassy office, Enterprise centre, Financial institution, Funeral home, Guesthouse, Home-based economic activity, Hostel (Tourist), Hotel, Industry (Light), Internet café/call centre, Live-work units, Media-associated uses, Media and related consultants, Mobility hub, Nightclub, Office, Off-license, Off-license (part), Open space, Place of public worship, Primary health care centre, Public house, Public service installation, Recycling facility, Residential , Restaurant, Science and technology-based industry, Shop (District), Shop (Local), Shop (Major comparison), Shop (Neighbourhood), Sport facility and recreation uses, Student accommodation, Take-away, Training centre, Veterinary surgery, Warehousing (Retail/non-food/retail park)

It is not considered that an alternative use would result in the best use of these lands, particularly having regard to the requirement for office development in this area proximate a major transport hub and future interchange. The environs of the subject site comprise a mix of uses, with residential, offices, schools, place of worship and other local services. The provision of residential development would result in an underutilisation of the site, due to the narrow configuration of the site, as such uses would require additional stair cores and set backs from boundaries to allow for private amenity space. A mix of uses is provided in the scheme in line with the Z5 zoning objective which seeks a mix of uses both horizontally and vertically through a scheme. The public transport accessibility of the site warrants development of a higher density in line with compact settlement principles and therefore low density uses would not represent and efficient use of land resources or public transport utilities.

3.2.2.1 Description of Alternative Processes

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 primarily for a commercial development. The Climate Action Energy Statement prepared by BPC Engineers identifies the energy standards with which the proposed development will have to comply and also sets out the overall strategy that will be adopted to achieve these energy efficiency targets.

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.

The proposed development will comply with non-residential Part L 2021 (Buildings other than dwellings) and target a BER of at least A2. The optimised approach is based on the Energy Hierarchy Plan – Be Mean, Be Lean, Be Green

- Be Mean: The façade performance specification has been optimised to limit heat loss in the winter, heat gain in the summer, improve airtightness and thermal transmittance, and maximise natural daylight.
- Be Lean: High efficiency plants will be specified to take advantage of the optimised façade design measures. Allow energy lighting design will be utilised to further reduce energy consumption and increase occupant thermal comfort. A building Management System (BMS) will ensure on-going efficiency in the operation of plant and prioritisation of energy reduction measures into the future.
- Be Green: Renewable energy technologies such as Air Source Heat Pumps (ASHP), mechanical heat recovery (MHVR), and Solar PV Panels are utilised. A number of sustainable design features have been considered within the design to achieve the sustainability targets of the proposed development. These include the proximity of the development to public transportation networks, water efficiency measures such as low consumption sanitary fittings, utilisation of captured rainwater for irrigation and greywater, and improved indoor environmental quality.

3.2.2.2 Alternative Design and Layouts

It must be noted that the subject lands are located in an urban/city centre context which poses tight limitations on layout options in comparison to a potential suburban or rural context on a significantly larger parcel of land.

The existing use of a vacant building and surface level car park is an under-utilisation of the land resource and the development of the site represents an opportunity to address this.

The subject lands form a key corner of the South Quays within the Custom House Setting. In light of existing, current and previously permitted development in the area the subject lands provide an opportunity to create a formal composition in response to the Custom House Setting.

In the interests of providing a strong urban design response, the building lines utilise the majority of the site, with localised increased in footpath widths at street level provided where appropriate. Providing further setbacks of building lines would not provide a satisfactory design response to the site.

3.2.2.2.1 George's Quay Local Area Plan

Figure 3.1 below showing Figure 30 and 31 of the now expired Georges Quay Local Area Plan (GQLAP) set out, what was in 2012 a desired plan for the subject lands to comprise active street frontage, a commercial or residential use and a maximum of 6 storeys (with provision for one setback storey) north of a line delineated by the Immaculate Heart of Mary Church, and a maximum of 9/10 storeys south of that line. There has been a significant change in National guidance on city planning policy since 2012 when the GQLAP was published, where a policy for greater height and density is now required for highly serviced urban locations. This policy has been accepted by Dublin City Council, as sites such as Tara Street and those developments contained within the Hawkins St./Tara St./Townsend St./Poolbeg St. block which have been granted permission for height and density in excess of the LAP guidance. Such a building form was not considered to be the most sustainable approach to developing the lands.

Figure 3.1. Extract from Geroge's Quay Local Area Plan

Fig 30: City Quay Site Design Framework

Fig 31: Conceptual Sketch of City Quay Site

3.2.2.2.2 Reg. Ref. 4674/22; ABP-315053-22 – 24 no. storey development

A planning application was submitted to Dublin City Council in August 2022 for a 24 no. storey building on the subject lands. The proposals comprised office accommodation from 1st – 23rd floor, and an arts centre, auditorium and café at ground floor and lower ground floor levels. The application was refused by Dublin City Council in October 2022 due to concerns regarding visual impact on the Customs House and the inappropriate scale and height of the proposed building. The decision was appealed to An Bord Pleanála who refused planning permission and did not accept the Inspector's recommendation to grant permission. This decision is currently subject to legal challenge.

While it remains the opinion of the client/applicant, that there is significant merit to the layout and form proposed **Reg. Ref. 4674/22; ABP-315053-22**, the subject application provides an opportunity to consider an alternative building layout and form, i.e. in lieu of a tall slender building, shouldered by buildings of a height consistent with the surrounding area thus creating a local landmark. The current alternative endeavours to reflect the views of the planning authority

Figure 3.2. CGI of Previous Development

3.2.2.2.3 Proposed Development – 14 no. storey development

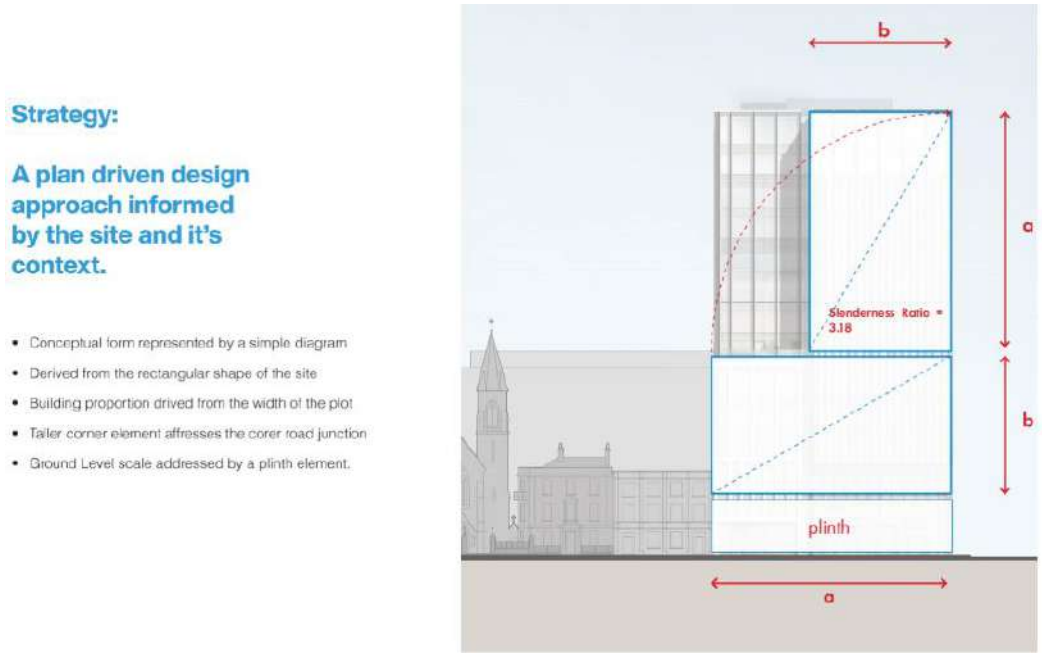
The height of the subject proposal has been designed to align with the specific objective for a locally higher building on the site; notwithstanding the provisions to make the case for a landmark building in the Development Plan.

Figure 3.3. CGI of Proposed Development (Visual Lab)

The massing of the building is broken down by the articulation of the façades into a series of appropriately proportioned volumes defined by the different levels and setbacks. The carefully considered balancing of the building volumes informs the height and the overall massing of the building. This has been considered from each of the primary vistas.

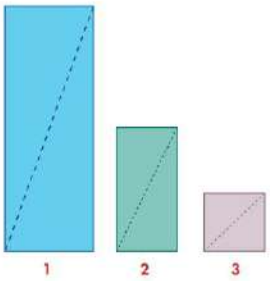
The reduced height of the current proposal may be more readily absorbed into the visual landscape.

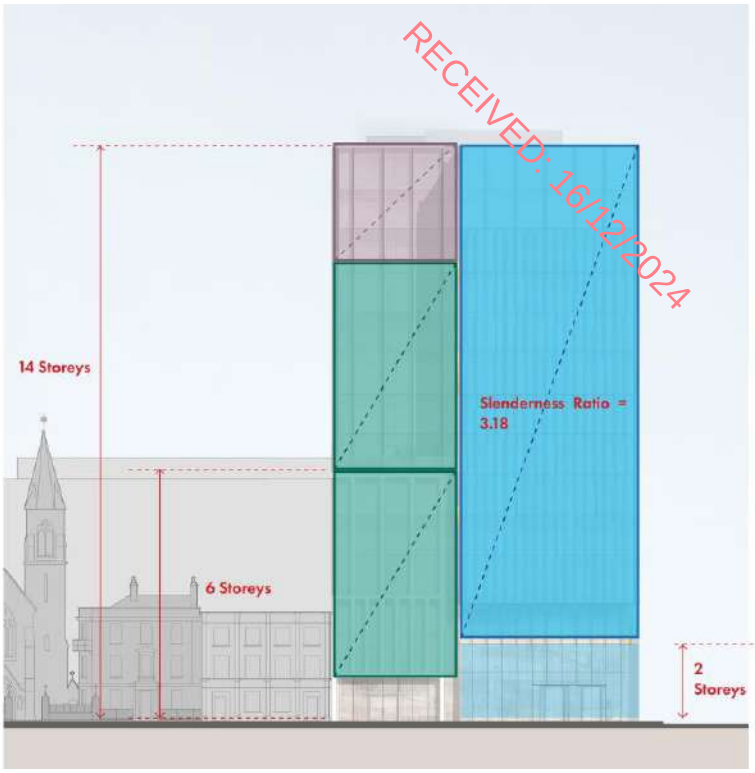
Figure 3.4. Extracts from Design Statement showing the overall design strategy



Composition:

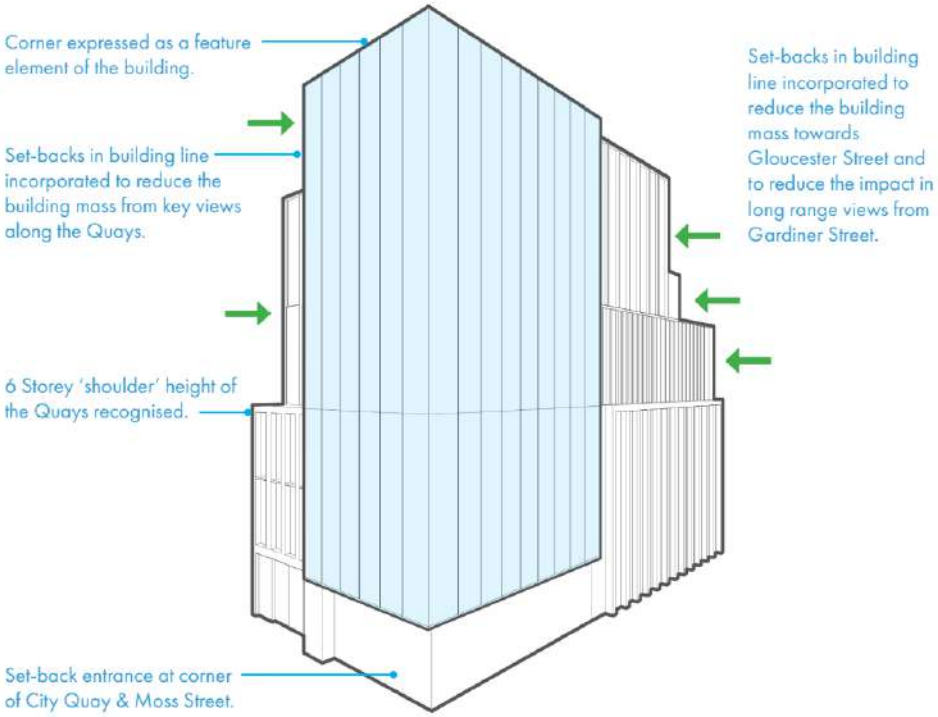
A composition of elegant individual geometric elements.





Form & Mass:

Sculpting the form & mass.



3.2.2.3 Alternative Mitigation

For each aspect of the environment, each specialist has considered the existing environment, likely impacts of the proposed development and reviewed feasible mitigation measures to identify the most suitable measures appropriate to the environmental setting of the proposed development. In making a decision on the most suitable mitigation measure the specialist has considered relevant guidance and legislation. In each case, a comparison of environmental effects was made, and the specialist has reviewed the possible mitigation measures available and

considered the use of the mitigation in terms of the likely residual impact on the environment. The four established strategies for mitigation of effects have been considered: avoidance, prevention, reduction and offsetting (not required in this development). Mitigation measures have also been considered based on the effect on quality, duration of impact, probability and significance of effects.

The selected mitigation measures are set out in each of the EIA Report Chapters 4-13 and Volume 3.

3.2.2.4 Conclusion on Alternatives

The proposed development was carefully designed, taking into consideration the site context, previous decisions by An Bord Pleanála and Dublin City Council, and the existing neighboring commercial, residential and educational properties and the local environmental conditions including air quality, noise and vibration, and visual impact.

The proposal will allow the development potential of the site to be maximised within the George's Quay area while improving visual impact and amenity through responsive architectural design, provision of public cultural space and mitigation measures to reduce the impact upon City Quay National School and the Immaculate Heart of Mary Church.

3.3 REFERENCES

- **The Department Housing, Local Government and Heritage, 2018.** *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.* Environmental Protection Agency. The Department Housing, Local Government and Heritage.

- **Dublin City Council, 2022**. *Dublin City Development Plan 2022-2028*. Dublin City Council.

- **Environmental Protection Agency, 2022.** *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.* Environmental Protection Agency.

4.0 POPULATION & HUMAN HEALTH

4.1 INTRODUCTION

The 2014 EIA Directive (2014/52/EU) has updated the list of topics to be addressed in an EIAR, replacing the term "Human Beings" with "Population and Human Health". This chapter also fulfils the requirement to assess "Human Beings" as outlined in Schedule 6 of the Planning and Development Regulations 2001 (as amended).

In preparing this chapter, careful consideration has been given to the other sections of this EIAR. Additionally, separate reports, including those on Construction and Demolition Waste Management and the Construction and Environmental Management Plan, have been taken into account. Population and Human Health represent a critical component of the environmental assessment, requiring thorough analysis of any potential impacts on human health arising from the proposed development. This topic encompasses a wide range of factors related to the existence, activities, and well-being of people as groups or populations. While most human developments have implications for people, this EIAR focuses on environmental aspects, such as changes in land use, increased building density, and emissions.

This section of the EIA Report has been prepared by John Spain Associates, Planning & Development Consultants, and provides a description of the proposed development. This chapter of the EIA Report was prepared by Blaine Cregan M.Sc. B.Sc. (hons) and B.Eng., Executive Director with John Spain Associates, and approved by John Spain, Managing Director.

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

4.2 STUDY METHODOLOGY

In line with the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022), this chapter has incorporated the guidance that:

"In an EIAR the assessment of impacts on population and human health should refer to the assessment of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g., under environmental factors of air, water, soil, etc."

Further, the EPA EIAR Guidelines (2022) specify:

"The evaluation of effects on these pathways is carried out by reference to accepted standards (usually international) of safety in dose, exposure or risk. These standards are in turn based upon medical and scientific investigation of the direct effects on health of the individual substance, effect or risk. This practice of reliance upon limits, doses and thresholds for environmental pathways, such as air, water or soil, provides robust and reliable health protectors [protection criteria] for analysis relating to the environment."

According to Article 3 of Directive 2011/92/EU (as amended by Directive 2014/52/EU), the environmental impact assessment is required to identify, describe, and assess the significant direct and indirect effects of a project on:

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

a) population and human health;

b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;

c) land, soil, water, air and climate;

d) material assets, cultural heritage and the landscape;

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

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

The European Commission's 2017 *Environmental Impact Assessment of Projects: Guidance on Preparing the Environmental Impact Assessment Report* elaborates that:

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

This chapter will adhere to the EC guidelines, examining the health impacts associated with the proposed development within a designated study area. The analysis of effects on population and human health will align with the requirements set forth in the EPA Guidelines.

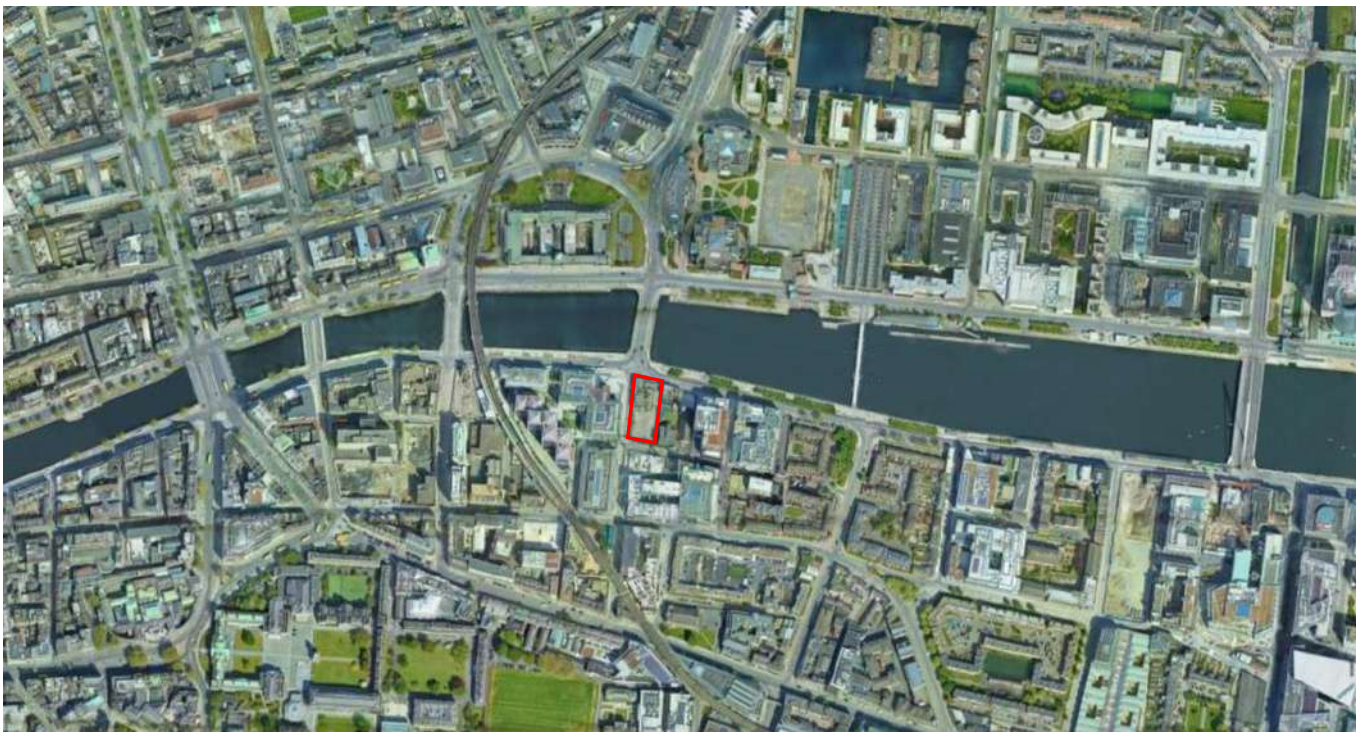
4.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

4.3.1 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 EPA and the Department, 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. The existing environment is considered in this section under the following headings:

- Employment & Economic Activity in the broader context of Ireland;
- Socio-Economic Patterns within Dublin and Assessment Area;
- Human Health within the Assessment Area;
- Social and Community Infrastructure in the Site's Vicinity; and,
- Land-Use and Settlement Patterns in relation to the subject site.

Figure 4.1. Aerial View of the Subject Site



Source: Google Map

The proposed development site is situated in Dublin 2, bounded by City Quay to the north, Moss Street to the west, and Gloucester Street South to the south. The site includes properties at 1-4 City Quay (D02 KT32), 5 City Quay (D02 PC03), and 23-25 Moss Street (D02 F854) and benefits from frontage along the River Liffey to the north. Currently, the site is brownfield, featuring a deteriorating, vacant, three-story building dating to approximately the 20th century. The southern section of the site is used as a surface car park.

To the east, the site is neighboured by City Quay National School, St. Mary's Crèche & Pre-School, and City Quay Church. Across Moss Street to the west lies the St. George's Quay office development, which ranges from 6 to 13 stories, and within the same city block to the east, the Grant Thornton building rises 5 to 9 stories. A hotel and residential development, reaching 8 stories, is currently under construction to the south, while the Custom House and the IFSC are located to the north.

The site is centrally positioned in Dublin's city and highly accessible: it is approximately 165 meters east of Tara Street rail interchange, 250 meters south of Busáras bus station and Luas stop, and 400 meters south of Connolly Station. Dublin Bus stops and Dublin Bikes stations are also directly adjacent on City Quay.

Figure 4.2. Aerial View of the Subject Site

Source: Google Map

The surrounding area is currently evolving with numerous developments completed, underway or on stream. Such developments include the 8-storey, 393-bedroom hotel and residential development recently delivered to the immediate south of the subject site at 44-53 Townsend Street, 33-39 Moss Street, 31-33 Gloucester Street South,

and including Bracken's Lane, as well as the recently granted 22-storey residential development located to the west along Tara Street.

Figure 4.3. Bird View of the Subject Site

Source: Google Map

Additional existing buildings in the surrounding area include the Grant Thornton building which ranging in height from 5-9 storeys is located to the east along City Quay as well as the George's Quay office development which is located directly to the west across Moss Street reaches 13 no. storeys in height.

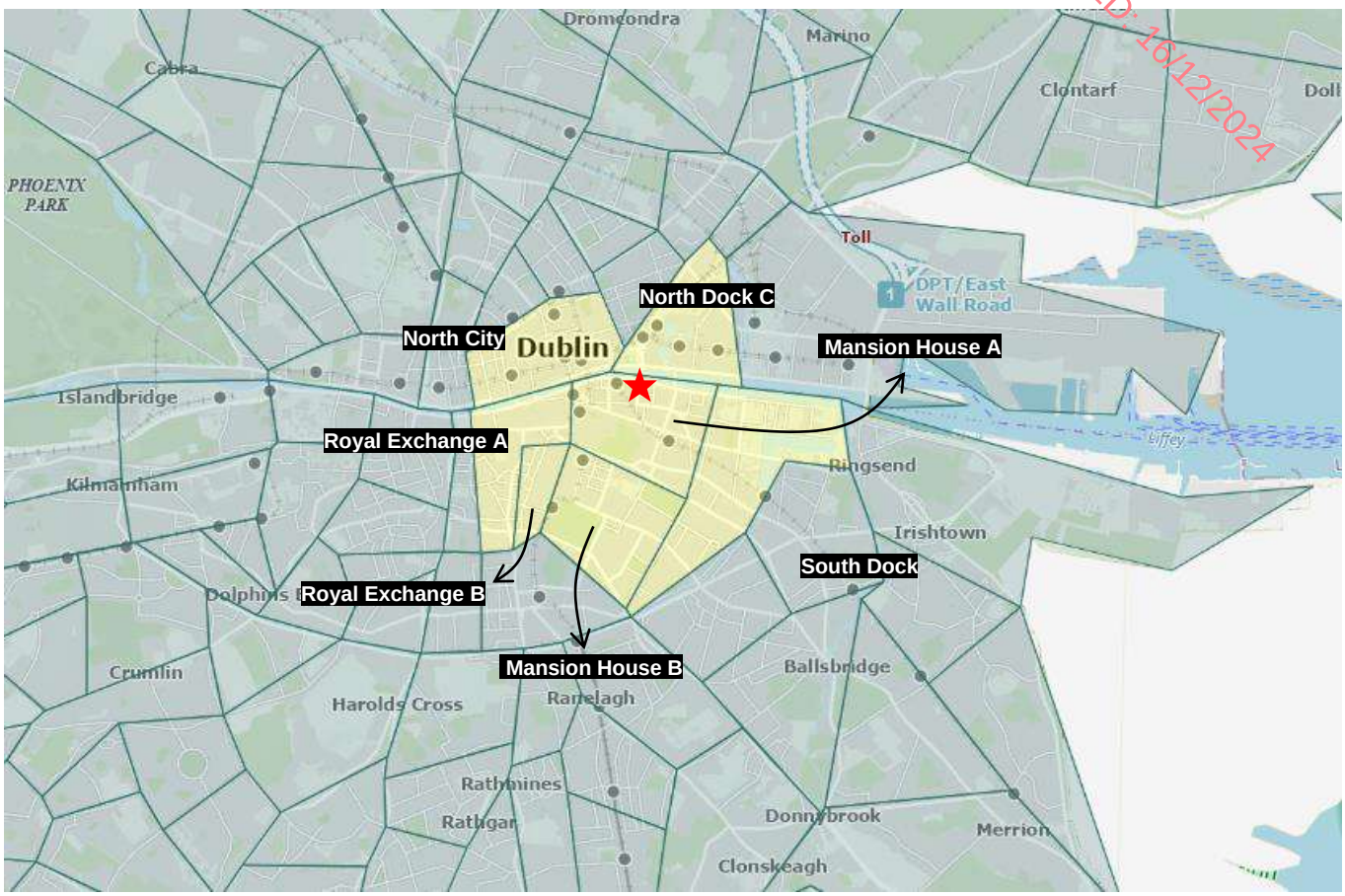
The surrounding area along the Liffey and within the George's Quay Local Area Plan is undergoing significant urban renewal and change. The subject site is a prime location to continue this urban renewal due to its location along the Quays and its proximity to high-quality public transport. The demolition of the existing buildings and redevelopment of the site by providing a high-density cultural and office scheme would have a vast improvement on the current streetscape.

A Demolition Justification Report has been prepared by Henry J Lyons Architects with input from other consultants and included with this application to provide a rationale for the demolition of the existing buildings on site.

From a statistical point of view, the subject site falls within the Electoral Division (ED) Mansion House A; However, the area selected for assessment of human health encompass a broader scope including EDs Mansion House A (02117), North city (02075), North Dock, C (02078), South Dock (02147), Mansion House, B (02118), Royal

Exchange, B (02145), and Royal Exchange A (02144). In the context of this EIAR, this broader area is referred to as the Assessment Area.

Figure 4.4. Spatial Scope of the Assessment Area (subject site location marked with a red star)



Source: CSO portal

In a strategic level, the site falls within the Dublin Strategic Planning Area (SPA) as per the Regional Spatial and Economic Strategy for Eastern and Midland Region, identified as the main global gateway to Ireland, with Dublin Airport one of the fastest growing in Europe and continued growth both in the import and export of goods through Dublin Port.

4.3.2 Employment & Economic Activity

The latest data from Ireland's Labour Force Survey, published by the CSO in August 2024, reveals a solid employment landscape, with a 2.7% increase in employment over the year leading to Q2 2024, translating to an additional 71,500 people working compared to the previous year. This brings total employment among individuals aged 15-89 to 2,754,200. Despite this growth, 20.8% of the workforce (571,600 people) remained in part-time roles, with nearly a quarter of these individuals (24.8%) expressing a desire for more hours and higher income.

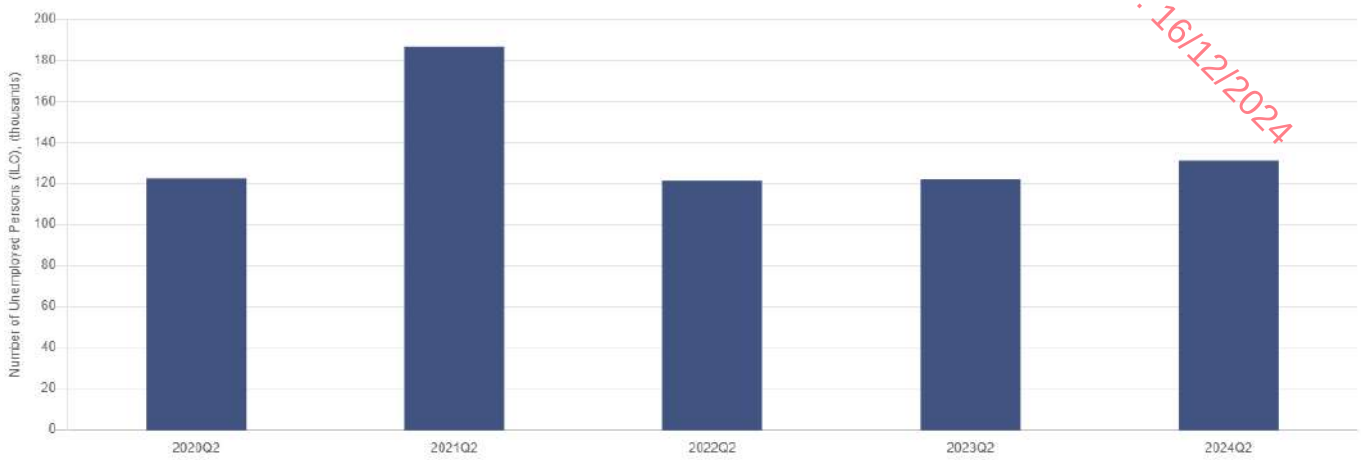
Age demographics show varying employment rates. The 35-44 age group had the highest employment rate at 84.7%, though this was a slight decrease from 85.5% the previous year. In contrast, the 15-19 age group had the lowest rate at 27.3%, while the 25-34 age group saw the largest increase, rising 1.7 percentage points to 84.3%.

Sector-specific shifts have been significant: the Wholesale & Retail Trade and Motor Vehicle & Motorcycle Repair sectors saw the largest declines, with employment dropping by 7.3%, followed by a 6.8% decrease in Construction. Meanwhile, Professional, Scientific, and Technical Activities showed a robust 12.7% increase, highlighting a shift toward knowledge-driven industries.

Unemployment figures reflect a slight uptick, with 131,200 people aged 15-74 classified as unemployed in Q2 2024, resulting in an unemployment rate of 4.6%, up slightly from 4.4% in Q2 2023. Overall, the labour force, which includes

all individuals aged 15-89 who are either employed or seeking work, rose by 2.9% (80,500 people) over the year to reach 2,885,400 in Q2 2024. Participation rates continued to rise, with an overall rate of 66.0% and a record-high female participation rate of 61.4%.

Figure 4.5. Number of unemployed persons aged 15-74 years, Quarter 2 2020 to Quarter 2 2024 (thousands)



Source: CSO statistical publication, August 2024

Economic reports from the Economic and Social Research Institute (ESRI) and the Central Bank of Ireland shed light on the broader economic context. The ESRI's quarterly economic commentary for Autumn 2024 highlights a continued decline in GDP through the first half of 2024, although the contraction slowed compared to 2023. In contrast, GNP, which was sustained in 2023 by income flows from the multinational sector, began to decline in Q2 2024 due to a reduction in these inflows. However, the ESRI notes that the robust labour market, with employment growth and a stable unemployment rate near 4%, underscores the resilience of the domestic economy, especially amid recent population increases.

The Central Bank of Ireland's Q3 2024 Quarterly Bulletin echoes this cautious optimism, stating that while economic growth and employment outlooks remain favourable, risks persist. Modified Domestic Demand (MDD)—a metric focusing on domestic economic activity—continued to grow annually, increasing by 1.4% compared to Q2 2023. However, it shrank by 0.5% on a quarterly basis in Q2 2024, driven by a 7.0% fall in Modified Investment. Growth in MDD was primarily supported by Personal Consumption (up 1.3%) and Government Consumption (up 3.7%).

Notably, the Central Bank's report points to high inward migration as a driver of employment growth, with 47,800 new jobs in the first half of 2024, nearly half of which were filled by non-Irish nationals. This influx has helped maintain strong employment figures despite broader economic headwinds, contributing to both the workforce and consumer spending, thus supporting domestic demand.

In summary, Ireland's labour market remains resilient, underpinned by growing participation rates and inward migration, even as the economy faces challenges with declining GDP and moderated growth in domestic demand. The outlook is cautiously positive, although economic uncertainties and sectoral shifts underscore the importance of monitoring these trends.

4.3.3 Socio-Economic Patterns

For the purpose of this EIAR, data from the 2016 and 2022 Census of Population has been reviewed to identify significant changes in population levels and age profiles at national, regional, county, and local levels. The 2022 Census results offer a comprehensive overview of current population figures, employment, economic statistics, and broader trends across the State. Additionally, census data on social class and household size at each of these levels was analysed. The following section provides a summary of the existing environment based on these key indicators.

4.3.3.1 Population

The 2022 Census marked a historic milestone, recording Ireland's population at 5,149,139—the first time it has exceeded five million since 1851. This reflects an 8.1% increase since 2016, with an additional 387,274 people over six years, averaging an annual growth rate of 1.3%.

In comparison, the previous census period (2011-2016) saw a total growth of 3.8%, or an annual average of 0.7%. Between 2016 and 2022, natural population growth accounted for 167,487 of the increase, while net migration added an estimated 219,787 people. This shift in dynamics shows that net migration (with an annual average of 36,631) contributed more to growth than natural increase (27,915) over the period, contrasting with prior censuses where natural growth was the primary driver.

While recent growth surpasses that of the 2011-2016 period, even higher average yearly increases were recorded in the census periods of 2002-2006 and 2006-2011. This trend highlights a return of inward migration and steady economic improvement, positioning Ireland for continued demographic and economic expansion.

Table 4.1. Population Change in Ireland and Dublin City during 2016-2022

Area	2016	2022	% Change 2016-2022
State	4,761,865	5,149,139	8.1%
County Dublin	1,347,359	1,485,154	10.2%
Dublin City Council	554,554	592,713	6.9%
Dún Laoghaire Rathdown County Council	218,018	233,860	7.3%
Fingal County Council	296,020	330,506	11.6%
South Dublin County Council	278,767	301,075	8.0%

Source: CSO StatsBank

At the county level, Census 2022 reveals a 10% population increase in Dublin, reaching 1,458,154 residents. This growth reflects an additional 137,795 people between April 2016 and April 2022. Over the same period, Ireland's total population also rose by 8%, from 4,761,865 to 5,149,139.

As summarised in the Table above, there appears a consistent population growth across all four Dublin local authorities, reflecting an overall trend of urban expansion. Fingal experienced the highest increase at 11.6%, indicating rapid suburban growth, while South Dublin saw an 8.0% rise. Dún Laoghaire-Rathdown and Dublin City had more moderate increases of 7.3% and 6.9%, respectively, with Dublin City's growth highlighting sustained demand within the urban core. Together, these figures underscore steady growth across the entire Dublin metropolitan area.

As summarised below, the Assessment Area experienced a notable population increase of 19.9% between 2016 and 2022, with the total population rising from 24,594 to 29,490 (i.e., +4,896 persons). This overall growth reflects a significant upward trend, particularly in areas such as South Dock and Royal Exchange A, which saw population increases of 19.1% and 12.0%, respectively. In contrast, Mansion House A, which contains the subject site, recorded a population decrease of 10.4%, declining from 4,665 in 2016 to 4,179 in 2022.

Table 4.2. Demographic Trend in the Assessment Area by ED, 2016-2022

Area	Area ID	2016	2022	% Change 2016-2022
Assessment Area	-	24,594	29,490	19.9%
Mansion House A	02117	4665	4,179	-10.4%
Mansion House B	02118	1,311	936	-28.6%
North City	02075	5,654	4,777	-15.5%
North Dock C	02078	4,214	4,254	0.9%
Royal Exchange A	02144	4,329	4,849	12.0%
Royal Exchange B	02145	2,082	2,150	3.3%
South Dock	02147	7,004	8,345	19.1%

Source: CSO StatsBank

This decline aligns with similar decreases in other neighbouring EDs, such as Mansion House B (-28.6%) and North City (-15.5%), highlighting a contrasting demographic trend within parts of the Assessment Area where some EDs experienced notable population growth, while others, including Mansion House A, saw reductions. This suggests a

possible shift in residential patterns within these urban core areas, as growth concentrates in other parts of the Assessment Area.

4.3.3.2 Age Profile

The age profile of the Assessment Area indicates that the majority of the population (47.6%) falls within the 25-44 age group, reflecting a predominantly working-age demographic. This trend is consistent across the majority of the EDs within the area, highlighting a concentration of residents in their prime employment years, which aligns with the area's role as an urban and commercial centre.

Other age groups show more variation across the EDs. The 0-14 age group represents 13.5% of the total population, with notable concentrations in areas like North City and South Dock, which may suggest family-oriented neighbourhoods or amenities that attract younger residents. Meanwhile, the 15-24 age group accounts for 14.7% of the population, with higher percentages in Royal Exchange A and South Dock, possibly indicating a presence of students or younger adults in these areas.

Table 4.3. Age Profile of the Assessment Area by ED, 2022

Area	0-14 y/o	15-24 y/o	25-44 y/o	45-64 y/o	65+ y/o
Assessment Area	**4,317**	**4,708**	**15,228**	**5,712**	**2,027**
% of Total	**13.5%**	**14.7%**	**47.6%**	**17.9%**	**6.3%**
Mansion House A	553	859	1,810	750	326
Mansion House B	109	112	452	245	103
North City	973	800	3,464	1,192	320
North Dock C	558	659	2,070	735	306
Royal Exchange A	604	964	2,271	930	294
Royal Exchange B	559	323	699	473	159
South Dock	961	991	4,462	1,387	519

Source: CSO StatsBank

The 45-64 age group makes up 17.9% of the population, while the 65+ age group, the smallest segment at 6.3%, is more evenly distributed but generally low across all EDs. Mansion House A and South Dock show relatively higher numbers of older residents, though these numbers remain modest. This overall age profile suggests a dynamic area, predominantly composed of young to middle-aged adults, with a smaller proportion of older residents, reflecting the area's appeal as a central, employment-oriented district rather than a retirement community.

4.3.3.3 Principal Economic Status & Social Class

The Table below outlines changes in the principal economic status of residents in the Assessment Area between 2016 and 2022, highlighting trends in employment, unemployment, new workforce entrants, and non-working categories. Key shifts include steady employment growth, a notable rise in new job seekers, and an increase in those unable to work due to permanent sickness or disability.

The economic status data for the Assessment Area shows a 2.3% increase in those "at work" from 2016 to 2022, indicating stable employment levels. There was a significant 19.7% rise in individuals "looking for their first regular job", pointing to more new entrants to the workforce. The category of "unable to work due to permanent sickness or disability" saw a 36.6% increase, suggesting a growing need for support services.

Declines were observed among those "unemployed after losing or giving up a job" (-4.8%) and the "retired" population (-8.5%). Meanwhile, the "other" category grew by 139.7%, though its overall numbers remain small. These trends reflect a mix of stable employment, an increase in new job seekers, and changes in non-working populations.

Table 4.4. Economic Status of Residents in the Assessment Area, 2016-2022

Economic Status	2016	2022	% Change 2016-2022
At work	17,327	17,730	2.3%
Looking for first regular job	279	334	19.7%
Unemployed having lost or given up previous job	1,755	1,670	-4.8%
Student	3,633	3,755	3.4%
Looking after home/family	943	1,083	14.8%
Retired	2,039	1,866	-8.5%
Unable to work due to permanent sickness or disability	786	1,074	36.6%
Other	68	163	139.7%
Total	**26,830**	**27,675**	3.1%

Source: CSO StatsBank

The following Table illustrates the distribution of social classes within the Dublin City Council area and the Assessment Area, highlighting shifts in employment categories between 2016 and 2022. The social class distribution in Dublin City shows a notable trend of growth in higher-skilled and professional categories, particularly among professional workers and managerial/technical roles. Between 2016 and 2022, the number of professional workers in the Dublin City Council area increased by 16.6%, while managerial and technical positions grew by 11.3%. This trend aligns with Dublin's position as a central employment hub, attracting higher-skilled and professional workforces, particularly in the inner city where access to employment and transportation is highly concentrated. These patterns reflect the city's evolving economic landscape, emphasising knowledge-intensive sectors and professional services.

Table 4.5. Social Class Distribution and Change in Dublin City Council and Assessment Area, 2016-2022

Area	Social Class	2016	2022	% Change 2016-2022
Dublin City Council	Professional workers	53,492	62,383	16.6%
	Managerial and technical	147,267	163,909	11.3%
	Non-manual	89,661	87,361	-2.6%
	Skilled manual	62,892	56,514	-10.1%
	Semi-skilled	50,188	57,990	15.5%
	Unskilled	20,871	19,717	-5.5%
	All others gainfully occupied and unknown	130,183	144,839	11.3%
	Total	**554,554**	**592,713**	**6.9%**
Assessment Area	Professional workers	2,770	2,802	1.2%
	Managerial and technical	6,994	7,157	2.3%
	Non-manual	3,527	3,248	-7.9%
	Skilled manual	2,051	1,908	-7.0%
	Semi-skilled	1,758	2,291	30.3%
	Unskilled	955	991	3.8%
	All others gainfully occupied and unknown	11,204	13,595	21.3%
	Total	**29,259**	**31,992**	**9.3%**

Source: CSO StatsBank

Conversely, there has been a decline in traditional skilled and unskilled roles, with skilled manual workers decreasing by 10.1% and unskilled workers by 5.5%. This decline points to a potential shift away from manual labour roles towards more knowledge-based employment, possibly driven by urban re-development and the increasing presence of high-skilled industries in central Dublin.

Within the Assessment Area, located in the inner city, these trends are echoed but with some unique distinctions. The total population in the Assessment Area increased by 9.3%, higher than the general city growth rate of 6.9%. This area saw a particularly significant increase in semi-skilled workers, rising by 30.3%, suggesting an influx of mid-level service or support roles that cater to the growing commercial activity in the area. Additionally, the category for

"all others gainfully occupied and unknown" also grew by 21.3%, possibly reflecting a broader diversity of occupations and roles not easily categorized, which may relate to the varied commercial activities surrounding the site.

However, like the wider city trends, there was a decrease in non-manual (-7.9%) and skilled manual (-7.0%) roles, indicating a similar shift in employment composition toward higher-skilled roles and service-oriented occupations. The modest growth in professional (1.2%) and managerial/technical (2.3%) roles within the Assessment Area aligns with Dublin's broader employment trends, though at a slower pace, likely reflecting the area's mixed residential and commercial character.

Overall, the trends in the Assessment Area align with Dublin's citywide trajectory towards professional and semi-skilled employment growth, reflecting the area's attractiveness due to accessibility and its role within the city's commercial core.

4.3.3.4 Educational Attainment

The Table below presents changes in the highest level of education attained by residents in the Assessment Area between 2016 and 2022. Key trends include a substantial increase in residents with no formal education, a decline in lower-level qualifications, and growth in secondary and tertiary education levels, reflecting a shift towards a more educated population in the area.

Table 4.6. Educational Attainment Levels in the Assessment Area, 2016-2022

Education Level	2016	2022	% Change 2016-2022
No formal education	229	457	99.6%
Primary education	1,338	968	-27.7%
Lower secondary	1,201	1250	4.1%
Upper secondary	1,675	1818	8.5%
Technical or vocational qualification	873	737	-15.6%
Advanced certificate/Completed apprenticeship	499	426	-14.6%
Higher certificate	676	615	-9.0%
Ordinary bachelor degree or national diploma	1,726	1734	0.5%
Honours bachelor degree, professional qualification or both	2,799	3036	8.5%
Postgraduate diploma or degree	3,841	4153	8.1%
Doctorate (Ph.D) or higher	482	470	-2.5%
Not stated	4,990	5077	1.7%

Source: CSO StatsBank

As detailed in the Table, there was a nearly doubling (99.6%) of residents with "no formal education", though this remains a small group. Conversely, there was a significant decrease in individuals with "primary education" as their highest level, down by 27.7%, and declines in "technical or vocational qualification" (-15.6%) and "advanced certificate/completed apprenticeship" (-14.6%) categories, indicating a potential shift away from lower-level qualifications.

Higher levels of educational attainment saw moderate growth. Residents with "upper secondary" education rose by 8.5%, and those with "honours bachelor degrees, professional qualifications, or both" also increased by 8.5%. Similarly, those holding "postgraduate diplomas or degrees" grew by 8.1%, reflecting an increasing trend toward advanced education in the area.

While the proportion of residents with "doctorate (Ph.D) or higher" decreased slightly (-2.5%), the overall data suggests a move toward higher educational qualifications, with more residents achieving secondary and tertiary-level education. This trend is likely indicative of an evolving, increasingly educated population in the Assessment Area.

4.3.4 Human Health

As of 2023, Ireland's population was estimated at 5.3 million, marking a 14.4% increase over the past decade, the third highest growth rate in the European Union (EU27) after Malta and Luxembourg. This growth contrasts sharply

with the EU27 average increase of just 1.7%. Ireland's demographic profile is gradually aging, with the proportion of people aged 45 or over rising from 35.4% in 2013 to 40.6% in 2023, while those under 45 decreased from 64.5% to 59.4%. Additionally, the proportion of the population aged 65 or over increased from 12.3% in 2013 to 15.3% in 2023, reflecting an aging trend.

Life expectancy in Ireland is relatively high by EU standards. In 2021, male life expectancy at birth was 80.5 years, 3.3 years above the EU27 average, while female life expectancy was 84.3 years, 1.4 years above the EU27 average. Ireland also ranks well for healthy life expectancy—the number of years an individual can expect to live in good health—with males at 66.4 years and females at 68.0 years, which is 3.8 years above the EU27 average for women.

Despite its high life expectancy and health outcomes, Ireland's healthcare spending as a percentage of GDP was 6.6% in 2021, the fourth lowest in the EU27 and well below the EU average of 10.9%. Ireland's fertility rate, at 1.8 in 2021, was among the highest in the EU, tied with France, Czechia, and Romania, though still below the theoretical replacement rate of 2.1.

These statistics highlight Ireland's strong population growth, aging demographic, high life expectancy, and relatively high fertility rate within the EU context. However, lower healthcare spending as a percentage of GDP suggests a need to monitor future healthcare demands as the population continues to age.

In 2022 and as summarised in the Table below, the general health of residents in the Assessment Area reflects a predominantly positive self-assessment, with the majority of individuals reporting their health as "Very Good" or "Good". Across the area, 12,837 residents rated their health as "Very Good", while 7,698 stated their health as "Good". This suggests that a substantial proportion of the population perceives their health favourably.

Table 4.7. General Health in the Assessment Area as Stated by Residents, 2022

General Health	Very Good	Good	Fair	Bad	Very Bad	Not Stated
Mansion House A	1,778	1,168	350	82	20	900
Mansion House B	459	206	44	7	0	305
North City	1,948	1,478	329	57	17	2,920
North Dock C	1,927	1,264	351	74	14	698
Royal Exchange A	1,615	1,022	248	45	19	2,114
Royal Exchange B	675	423	140	37	10	928
South Dock	4,435	2,137	476	72	17	1,183
Total	**12,837**	**7,698**	**1,938**	**374**	**97**	**9,048**

Source: CSO StatsBank

However, smaller segments reported less optimal health. A total of 1,938 residents described their health as "Fair", while 374 stated it was "Bad" and 97 rated it as "Very Bad". Notably, there is a considerable number of residents who did not state their health status, totalling 9,048 across the Assessment Area. Among individual Electoral Divisions, South Dock had the highest number of residents reporting "Very Good" health (4,435), whereas areas like Mansion House B and Royal Exchange B had fewer respondents in this category, likely reflecting differences in population size or demographic composition within these areas.

Table 4.8. Persons with Disability in the Assessment Area, 2016-2022

Persons with Disability	2016	2022	% Change 2016-2022
Mansion House A	592	914	54.4%
Mansion House B	75	123	64.0%
North City	433	786	81.5%
North Dock C	549	867	57.9%
Royal Exchange A	420	696	65.7%
Royal Exchange B	276	397	43.8%
South Dock	582	1,425	144.8%
Total	**2,927**	**5,208**	**77.9%**

Source: CSO StatsBank

As detailed in the Table above, between 2016 and 2022, the number of persons with disabilities in the Assessment Area increased significantly, rising by 77.9% overall. This increase highlights a growing need for accessible infrastructure, services, and support within these communities. In 2022, a total of 5,208 residents across the area reported having a disability, compared to 2,927 in 2016, underscoring a trend that may be influenced by population growth, aging demographics, or increased self-reporting.

The South Dock ED saw the largest increase, with a 144.8% rise in residents with disabilities, reaching 1,425 in 2022. Other divisions also recorded substantial growth, including North City (up 81.5%) and Royal Exchange A (up 65.7%). Mansion House A and North Dock C saw increases of 54.4% and 57.9%, respectively, while Mansion House B and Royal Exchange B experienced more modest growth rates of 64.0% and 43.8%. These figures suggest an upward trend across the area, reflecting the diverse needs of persons with disabilities and emphasizing the importance of inclusive planning and services within these neighbourhoods.

4.3.5 Social Infrastructure

Social infrastructure refers to the variety of services and facilities that fulfil both local and strategic needs, contributing significantly to residents' quality of life. In this context, social infrastructure includes essential services such as local businesses, educational institutions, healthcare facilities, emergency services, places of worship, and natural resources, all of which create a supportive environment within Dublin City. It is critical to note that John Spain Associates have prepared a Social and Community Audit under a separate cover, submitted with the planning application which we respectfully invite the Planning Authority to refer to for full details.

4.3.5.1 Businesses

The site currently encompasses the disused former Dublin Arts Centre and surface car parking. The surrounding area supports a diverse range of commercial activities, including high- and low-density office buildings, tourist accommodations, pubs, cafes, and retail shops, underscoring the area's role as a key employment and business hub in central Dublin.

4.3.5.2 Education

Within the immediate area, City Quay National School is located adjacent to the eastern boundary of the site, serving as a key educational institution for local families. Additionally, Trinity College Dublin is situated approximately 220m south of the proposed development, contributing to the area's educational and cultural landscape.

4.3.5.3 Healthcare

Dublin City offers a wide range of healthcare facilities. The National Maternity Hospital on Holles Street is located about 850m southeast of the site, while the nearest general hospital, St. James's Hospital, is approximately 3.8km to the west. Various fitness centres, including the Gloucester Street Sports and Recreational Centre nearby, provide additional health and wellness amenities for the community.

4.3.5.4 Emergency Services

Emergency services are easily accessible from the proposed site. Pearse Street Garda Station is located around 320m to the southwest, and the Dublin Fire Brigade Headquarters on Townsend Street is about 190 meters away, ensuring prompt emergency response capabilities in the area.

4.3.5.5 Places of Worship

There are two notable places of worship in close proximity to the site: the Immaculate Heart of Mary Catholic Church, approximately 20 meters to the east on City Quay, and St. Mark's Pentecostal Church on Pearse Street, roughly 180m south of the development.

4.3.5.6 Natural Resources

Consideration has been given to the natural resources and land use in the vicinity of the proposed development, as these factors could have implications for the project.

The subject site was originally reclaimed from the River Liffey around 1720 and has been in urban use ever since. Initially developed for residential purposes, the southern portion of the site later transitioned to industrial use, housing a brewery in the early 1800s and a coal yard from the mid-1850s until the 1930s. Following this period, the site remained unused until it was repurposed as the City Arts Centre from 1987 to 2001, with surface parking introduced in the southern section. Currently, although surface parking persists, the rest of the site has reverted to a derelict state.

A review of geological heritage in the area, based on the Geological Survey of Ireland's Public Viewer, confirmed that there are no sites of geological heritage within the immediate vicinity of the proposed development. The nearest geological heritage site is located approximately 0.39km to the south at Trinity College Dublin's Museum Building, notable for its preserved original interior dating back to 1857.

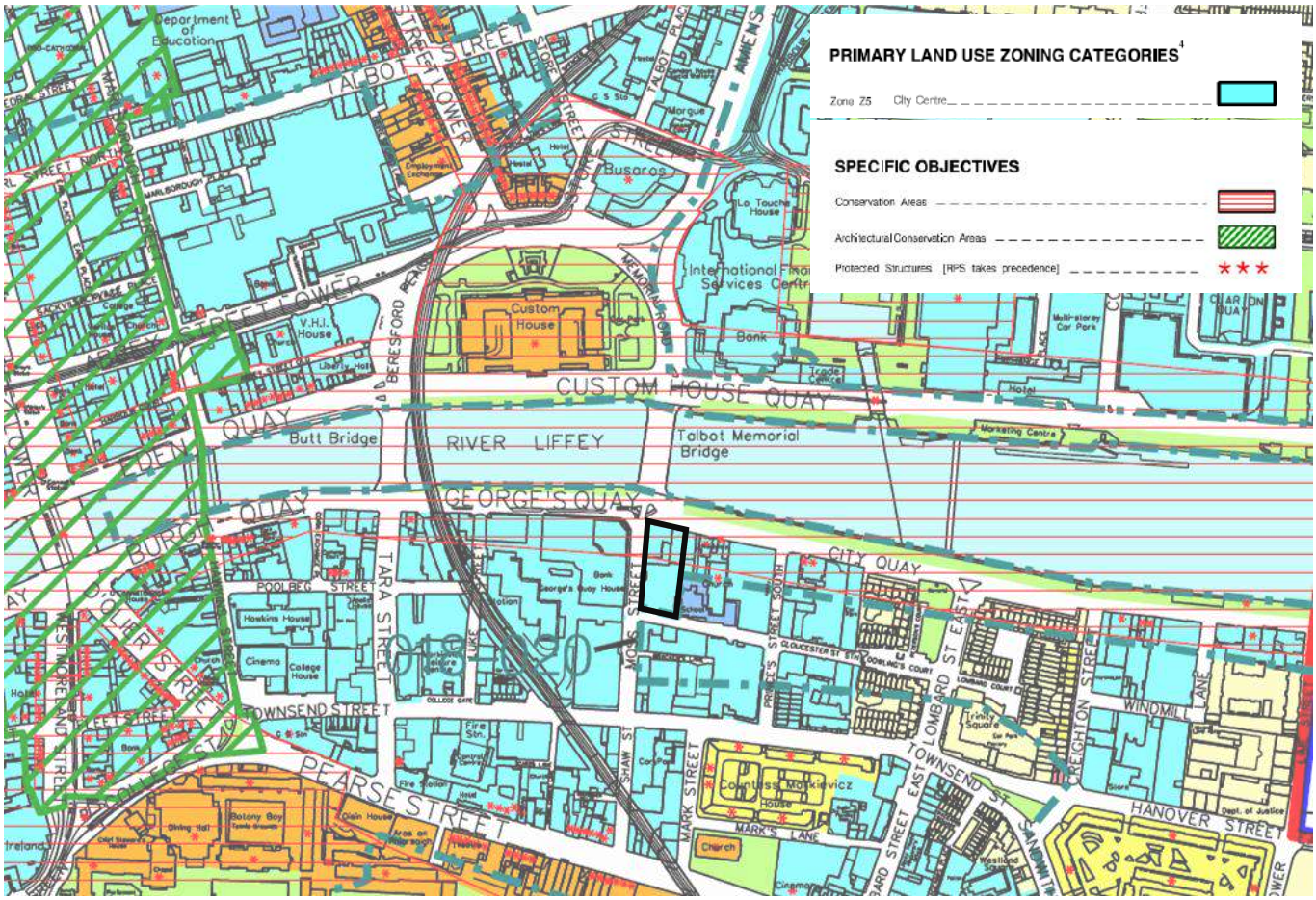
The GSI's 2021 mineral database was also consulted to assess the proximity of mineral extraction sites. The nearest active quarry, Huntstown Quarry, is approximately 9km northwest of the proposed development. This limestone quarry supplies aggregates and fill materials, but it is sufficiently distant to have no direct impact on the subject site.

Additional information on extractive industries and their regional impact can be found in the Chapter 7 covering Land, Soils, Geology, and Hydrogeology.

4.3.6 Land Use & Settlement Patterns

The subject site is located within the administrative boundaries of Dublin City Council with its development governed by Dublin City Development Plan 2022-2028 (CDP). Under the current CDP, the subject site is zoned ***"Z5 – City Centre"*** with an objective *"To consolidate and facilitate the development of the central area, and to identify, reinforce, strengthen and protect its civic design character and dignity"*.

Figure 4.6. Land use zoning map extracted from the Development Plan (approximate boundaries of the site outlined in black)



Source: Dublin City Development Plan 2022-2028, Development Plan Mapset E

With respect to the permissible uses under pertinent zoning objective, the proposed commercial development, consisting of office use, arts and cultural spaces, and café is permitted in principle under Z5 zoning and therefore, the proposal is consistent with the pertinent zoning objective.

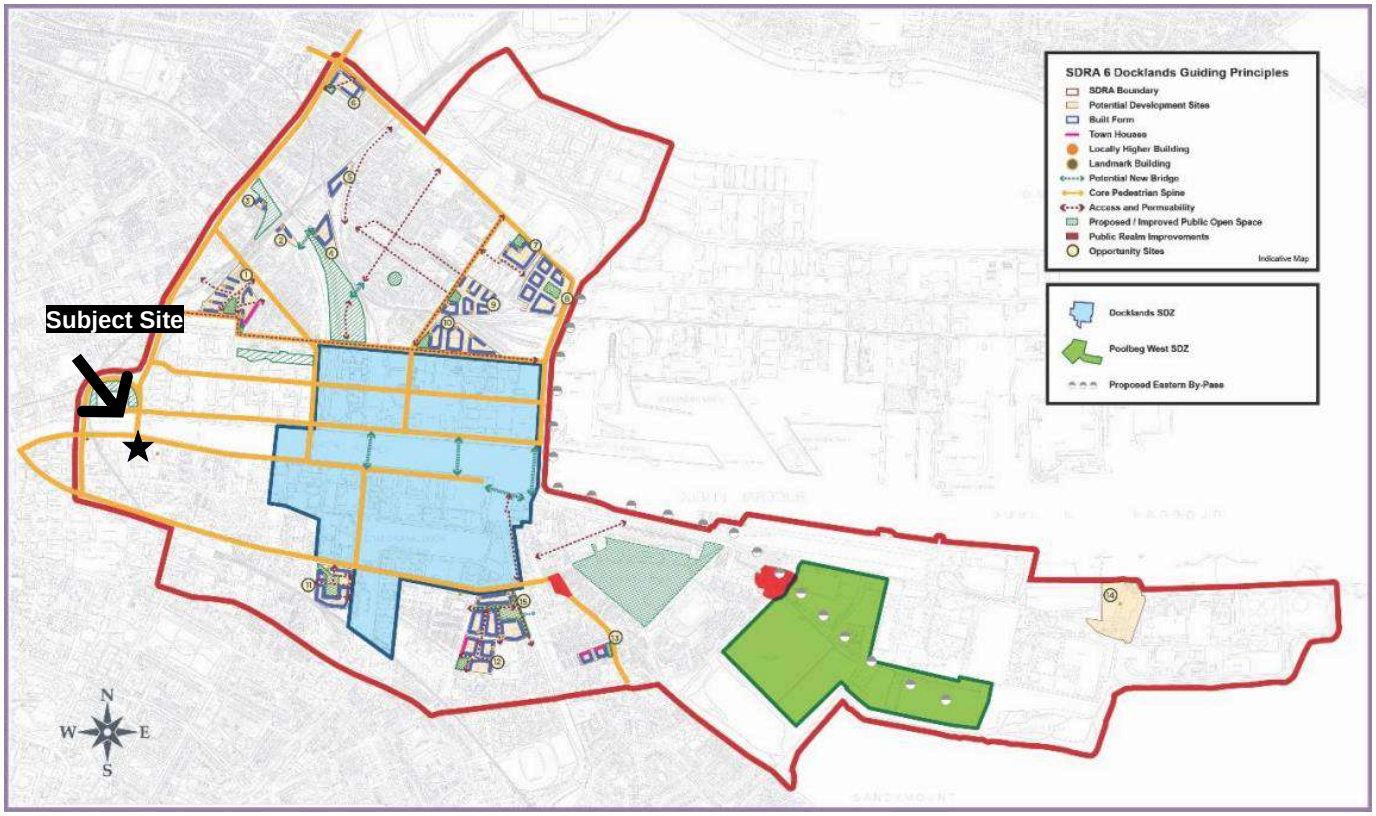
Stated in the Development Plan, *"The primary purpose of this use zone is to **sustain life within the centre of the city through intensive mixed-use development**. The strategy is to provide a dynamic mix of uses which interact with each other, help create a sense of community, and which sustain the vitality of the inner city both by day and night. As a balance, and in recognition of the growing residential communities in the city centre, adequate noise reduction measures must be incorporated into development, especially mixed-use development, and regard should be given to the hours of operation.*

*Ideally, **a mix of uses should occur both vertically through the floors of buildings as well as horizontally along the street frontage**. A general mix of uses, e.g. retail, commercial, residential, will be desirable throughout the area and **active, vibrant ground floor uses promoted**. On Category 1 retail streets, retail should be the predominant ground floor use"*. [emphasis added]

In line with the Development Plan's vision for Z5 zoned lands, which highlights the importance of central urban sites, the proposal aims to establish a balanced mix of uses that responds both to the site's strategic location and the scheme's viability. By facilitating the demolition of the existing, non-protected buildings and structures, the proposal allows for a comprehensive re-development that will bring the site in closer alignment with these strategic objectives. This re-development not only supports the area's urban context but also enhances the potential of the site to contribute meaningfully to the surrounding urban fabric, reinforcing the goals of compact growth and central city revitalisation.

It is also critical to note that as per City Development Plan, the subject site falls within Strategic Development Regeneration Area (SDRA) 6 – Docklands, which accordingly forms a key part of delivery delivering compact growth within Dublin.

Figure 4.7. Subject Site within the SDRA 6 (approximate location of the site denoted with a black star)



Source: Dublin City Development Plan 2022-2028

As outlined in the Chapter 13 of the Development Plan, SDRA 6 "*extends to circa 520 hectares and has **significant potential for further regeneration with a number of key development sites throughout the area**. These sites*

can make a valuable contribution to the future physical and social regeneration of this part of the city, consolidating the area as a vibrant economic, residential, cultural and amenity quarter of the city, whilst simultaneously nurturing sustainable well-integrated neighbourhoods and communities". [emphasis added]

Stated under **Policy CEE19** of the Development Plan, the Council seeks:

***"To promote and facilitate the transformation of Strategic Development and Regeneration Areas (SDRAs) in the city**, as a key policy priority and opportunity to improve the attractiveness and competitiveness of the city, including by promoting high-quality private and public investment and by seeking European Union funding to support regeneration initiatives, for the benefit of residents, employees and visitors."* [emphasis added]

With respect to the above, the subject site is essentially identified for regeneration, change and transformation and therefore, demolition of the non-protected buildings on the site is in keeping with the relevant planning policy.

The Planning Report which accompanies this application addresses the planning context issues in more detail, which we respectfully invite the Planning Authority to refer to same.

4.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development aims to transform a significant brownfield site at the junction of City Quay, Moss Street, and Gloucester Street South in Dublin's city centre. This ambitious project envisions a 14-story commercial building featuring office spaces, an art gallery, and art studios, with a total height of 61.05 meters above ground, complemented by a two-level basement. The site includes addresses at 1-4 City Quay, 5 City Quay, and 23-25 Moss Street and covers an area of over 0.2 hectares. Currently, the site is vacant, with its last use being surface parking and remnants of the former City Arts Centre, now in a derelict state. The development presents a unique opportunity to rejuvenate this prime, underutilised urban land within Dublin's core.

The development also emphasises accessibility and sustainable transport options. The two basement levels will provide 11 no. car parking spaces, 314 no. bicycle parking spaces and 3 no. motorbike parking spaces, supporting an active commuting culture in this well-connected area. Ancillary works, including public realm improvements, landscaping, telecommunications infrastructure, and utility connections, will complement the building's design and enhance the site's integration with its surroundings.

A full description of the proposed development is provided in Section 2 of this EIAR document, along with the alternatives explored on the site, which we respectfully invite the Planning Authority to refer to.

4.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

This section provides a description of the specific, direct and indirect, impacts that the proposed development may have during both the demolition/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 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 Report (4-15) assess the environmental topics outlined in the EIA Directive.

4.5.1 Construction Phase

The construction phase of the proposed development, which includes demolition of existing structures and new building work on-site, is not expected to create any long-term changes to population demographics in the area nor the subject site. However, this phase will generate a range of *short-term impacts* on the community, both *positive* and *negative*, with implications for human health and safety, economic activities, and local infrastructure. Below, an overview of these potential impacts on human health, economic activity, and community infrastructure is provided.

4.5.1.1 Human Health and Safety

During the demolition and construction phases, human health and safety will be influenced primarily by changes in air quality, noise, and vibration levels. As outlined in Chapter 8 of the EIAR, demolition and excavation works will

occur in separate phases, potentially generating fugitive windblown dust from mechanical equipment like excavators, tipper trucks, and vehicle movement on exposed surfaces. Demolition waste will be removed by HGV trucks, which may also produce dust during loading. Construction vehicle movement and concrete cutting will contribute to further dust emissions, particularly when dusty material is loaded onto trucks traveling on public roads. Additionally, the use of site vehicles, plant, machinery, pumps, and generators will result in fossil fuel emissions. As detailed in the aforesaid chapter, the potential impacts of the demolition and construction phase on air quality will be *negative*, *significant* and *short-term*. Therefore, best practice dust mitigation measures appropriate for sites with a high risk of dust impacts will be implemented to ensure there are no significant impacts at nearby sensitive receptors.

As outlined in Chapter 9 of the EAIR, the demolition of existing buildings and hard-standing areas will utilise a variety of plant and machinery and will include excavators, dump trucks, compressors and generators. The operation of these items of plant has the potential to generate *short term* elevated noise levels and ground vibration. Demolition works will occur for an approximate 2–4-week period. Furthermore, the 'Site set up' activities prior to construction will involve the construction of security hoarding, site offices, storage areas, and staff facilities, which will generate minimal noise. Site clearance, levelling, and excavation will require the use of equipment like excavators, dump trucks, compressors, and pneumatic breakers, potentially causing short-term elevated noise levels beyond the site boundary. Truck movements for site clearance and basement excavation will increase HGV traffic and noise levels. During the construction phase, extensive machinery and traffic will generate noise, with the highest levels occurring during general construction activities. Noise will be *short-term* and *limited to daytime hours* to minimise impacts. There is potential for a moderate short-term increase in noise, including tonal and impulsive sounds from typical construction activities.

Overall, the results of the assessment have indicated that the construction daytime noise limit of 75dB $L_{Aeq,\ 11hr}$ can be complied with during both demolition and construction works. It is also important to note that the impact due to construction activities will be transient in nature. The vibration impact associated with construction works will result in a *negative, moderate,* and *short-term* effect at the closest receptors during the construction phase.

Full details of the impacts from the proposed development on Air Quality is covered under Chapter 8, while Chapter 9 is focused on Noise and Vibration, which we respectfully invite the Planning Authority to refer to.

4.5.1.2 Economic Activity and Employment

The construction phase will contribute positively to local economic activity by generating temporary employment for approximately 300 workers. This influx of workers will support local businesses, such as cafes, restaurants, and shops, as workers utilise these facilities, providing an economic boost to the area. These benefits will be particularly valuable for businesses looking to recover from economic downturns or expand their customer base.

With close proximity to major transport hubs, including Tara Street Station and various bus routes, most workers are expected to commute from their homes, thus minimising demand on local housing resources and short-term accommodations. The project will also indirectly benefit local suppliers and service providers in related industries, including construction materials, waste disposal, and equipment rentals. Additionally, specialised workers will be brought in periodically for specific tasks, adding to economic activity without placing pressure on local housing.

Overall, this phase is anticipated to yield a *moderate*, *short-term positive* impact on the local and wider economy, stimulating both direct and indirect employment and business opportunities.

4.5.1.3 Local Amenities and Community Infrastructure

The construction phase will create temporary visual impacts that may affect the aesthetic appeal of certain views, particularly along the River Liffey Conservation Area. While construction equipment, scaffolding, and materials will alter the landscape, these impacts are anticipated to be *moderate* and *short-term*.

Despite these temporary changes, local amenities such as water supply, transportation, and tourism services are not expected to be adversely impacted. The site's existing connections to water, sewer, and electricity infrastructure are confirmed as adequate to meet the construction demands, ensuring no disruption to public utilities, as confirmed by Irish Water in Chapter 13 of the EIAR.

The project's design and health and safety planning, in compliance with the *Safety, Health, and Welfare at Work Act 2005*, will ensure that risks associated with construction are managed to protect both workers and the public.

Additionally, the site has been assessed for natural disaster risks, such as flooding, with mitigation strategies in place to prevent impacts from minor flood risks identified along the northern boundary.

In summary, the demolition and construction phases are expected to have mixed impacts. Positive impacts include short-term boosts to employment and local business activity, while negative impacts, such as temporary disruptions to air quality, noise levels, and visual amenity, will be managed through rigorous mitigation strategies.

4.5.2 Operational Phase

The operational phase of the proposed development will establish a permanent change in land use, transforming the site from a long-vacant, derelict area into an active commercial and cultural hub. The new development will include commercial spaces and community-supporting facilities, such as dedicated cultural and art spaces, designed to integrate with the public realm at ground level. These spaces will create a vibrant extension of the public area, revitalising this centrally located site. The surrounding land uses—currently a mix of commercial and residential activities—will remain largely unchanged, allowing the new development to positively complement the area's character.

This shift in land use is anticipated to have a lasting positive impact, aligning with the zoning objectives in the Dublin City Development Plan 2022-2028. The site's re-development, spanning approximately 0.2 hectares, will support economic activity through modern, open floorplates suitable for commercial headquarters, and provide much-needed cultural amenities, elevating the site's profile within the immediate community as well as the wider context. The addition of a high-quality commercial development and carefully designed public spaces is expected to make a positive contribution to the surrounding area, enhancing local engagement and supporting long-term community and economic goals.

Below, the expected impacts during the operational phase are detailed under the categories of Human Health and Safety, Economic Activity and Employment, and Local Community Infrastructure.

4.5.2.1 Human Health and Safety

As outlined in Chapter 8 of the EIAR, if modern energy efficient mechanical plant, insulated materials and low-quality windows were not to be used in the design and construction and mechanical plant was not maintained correctly, the impact on air quality would result in greater emissions to atmosphere which would result in a *negative, slight* and *long-term.*

In terms of noise and vibration, there will be minimal noise sources associated with its operation that may cause nuisance at local receptors. Mechanical roof plant to be located at 7th floor level when maintained on a routine basis will not generate audible noise at any receptor. The operation of the proposed development will not generate ground vibrations.

The potential impacts of the development on sunlight and daylight have been extensively analysed, with careful attention to surrounding properties, including the City Quay National School. A Sunlight and Daylight Assessment carried out by 3D Design Bureau indicates that the level of effect to all residential properties within the area have all been categorised as *negligible* and *minor adverse*. As stated within the aforesaid report, while the levels of effect to the commercial premises vary, these have been clearly identified and rationalised within the assessment.

A Pedestrian Wind Comfort Analysis, conducted by BPC Engineers, evaluated the wind comfort levels within and around the site post-construction and identified areas where potential wind mitigation measures may be needed. Overall, the analysis found that most areas at ground level, including adjacent public footpaths and streets, meet or exceed the Lawson 'Strolling' criteria for wind comfort. Some ground-level areas meet the Lawson 'Business Walking' criteria; however, these are generally located on the roadway, where pedestrian impact is expected to be *minimal*. According to this assessment, the prevailing wind directions are from the west-southwest and west, with the building's largest façade positioned perpendicular to these winds. This orientation results in a downwash effect, particularly impacting the wind comfort on Moss Street. Nevertheless, even with this effect, most surrounding footpaths and walkways meet the 'Standing' or 'Strolling' criteria. Consequently, the wind environment at ground level after construction is expected to be *comfortable* for most users throughout the year.

Overall, the effect on human health from noise, air quality, vibration, sunlight/daylight, and wind conditions during the operational phase is expected to be *neutral* and *requires no additional mitigation*.

Safety measures for both workers and visitors will be governed by a comprehensive Environmental Management System (EMS), which will ensure compliance with all relevant health and safety regulations. The EMS includes training for employees on safety protocols and ongoing measures to address health guidelines, ensuring a safe environment for all users of the development.

4.5.2.2 Economic Activity and Employment

The operational phase will deliver *long-term positive* impacts on economic activity and employment in the area. The commercial spaces and cultural amenities within the development, particularly the arts centre, will attract office workers, visitors, and tourists, stimulating economic activity in surrounding businesses, such as cafes, restaurants, shops, and service providers. This influx of patrons will support local revenue and enhance the area's economic resilience.

The arts centre, in particular, is expected to function as a cultural destination within the Dublin Docklands, increasing foot traffic and generating positive spillover effects for the local business community. In line with Dublin City Council's policies for cultural and tourism development, the addition of cultural facilities will attract new visitors, while also supporting the area's reputation as a vibrant economic and cultural hub. This activity will sustain employment opportunities both directly within the development and indirectly in surrounding businesses, contributing significantly to the local and broader economy.

4.5.2.3 Local Amenities & Community Infrastructure

The proposed development will integrate with and enhance existing community infrastructure, bringing *positive long-term* benefits to the local area. The inclusion of a cultural arts centre will not only enrich the area's amenities but also support Dublin City Council's objectives to expand public access to cultural resources. The arts centre will encourage public engagement, foster community connections, and attract tourists, enhancing Dublin Docklands as a key cultural and economic destination. The development's position along the River Liffey will further establish it as a key structure enhancing legibility of the city, bridging the gap between the city centre and Docklands and adding visual interest to the urban landscape.

Utility needs for the development have been carefully planned to ensure that existing community resources remain unaffected. The building's energy requirements will be met through photovoltaic (PV) panels on the southern façade, supplemented by the national grid, ensuring *no adverse impact* on the local power supply. Irish Water has confirmed that there is sufficient capacity for potable water and wastewater management, guaranteeing reliable service without straining existing resources for local residents and businesses.

Traffic impacts are expected to be *minimal* due to the development's proximity to major public transportation hubs, including the existing Tara Street station and emerging MetroLink station. Many visitors and employees are likely to rely on public transit, reducing the number of additional vehicles on local roads. As detailed in Chapter 11, the increase in traffic volume will be *negligible* and is not expected to disrupt local traffic flow or place strain on the road network. This strategic positioning supports sustainable transportation use and aligns with the city's goals for reducing traffic congestion in urban areas.

In summary, the operational phase of the proposed development will create *meaningful long-term* benefits for the community, with *positive effects* on economic activity, cultural engagement, and local infrastructure. Human health and safety considerations will remain *neutral* and *manageable*, and the development will contribute to the vitality and accessibility of Dublin's Docklands area, aligning with broader urban planning and community goals.

4.6 POTENTIAL CUMULATIVE IMPACT

The cumulative impacts of the proposed development on population and human health have been evaluated in light of ongoing changes in the surrounding area. This assessment included site visits, a desk-based review of relevant planning applications, and an examination of nearby land uses and developments. These efforts aimed to understand the current development pattern and identify any relevant projects—either permitted or under construction—that could influence the baseline environment in terms of population and human health.

The proposed commercial development, along with other ongoing and permitted projects in the area—predominantly commercial with some residential elements—will drive increased commercial activity and employment opportunities in the vicinity, contributing positively to local population dynamics and supporting pertinent planning policy and zoning objectives.

During the construction phase, including demolition activities, the project is not expected to significantly affect the established population or demographic trends in the area. However, from a human health perspective, these emerging developments may temporarily impact the surrounding population due to noise, traffic, and general construction activity. As outlined in the EIAR, the implementation of noise and traffic management measures will help minimise disruptions to nearby communities, ensuring a controlled and manageable construction environment.

In the operational phase, the cumulative effect of this development and adjacent projects is anticipated to bring a sustained increase in population and foot traffic, particularly in the commercial sector. This growth will have a moderately positive impact on the immediate area, fostering a more dynamic urban environment and contributing slightly to broader population and economic growth within Dublin's city centre. The area's visual character will also evolve, as new commercial structures and arts and cultural spaces blend into the urban landscape, reinforcing its role as a vibrant and modern commercial hub.

The review of surrounding developments focused on larger, more impactful projects based on their scale, use mix, and proximity to the proposed development. Minor applications, such as small extensions, minor works, etc. were excluded. The search primarily covered relevant permissions from the last five years, with additional consideration for longer-term projects holding 10-year permissions.

Key projects in the area include:

- Dublin City Council Reg. Ref. 3684/21: Amendments to Reg. Ref. 4170/19 (ABP-306335-20), a 12-storey, 58-unit "Built-to-Rent" development at Apollo House, currently under construction.

- Dublin City Council Reg. Ref. 3091/21: A 9-storey office building over a double basement at 157-164 Townsend Street, Dublin 2, currently under construction.

- Dublin City Council Reg. Ref. 2877/21: Amendments to Reg. Ref. 4778/19 – A 9-storey mixed use development over single-storey basement at Brunswick Villas, Shaw Street, Townsend Street and Spring Garden Lane, approved permission.

- Dublin City Council Reg. Ref. 3054/22: 12 to 16 storeys office development across 4 building blocks at "Dublin Arch", on a site adjacent to Connolly Station, Sheriff Street Lower, approved permission.

In combination with these nearby projects, potential cumulative impacts on human health during construction include increased pressure on road infrastructure from additional HGV traffic, economic benefits to local businesses and suppliers, and potential negative effects from dust and noise. Each of these cumulative impacts has been analysed within the relevant chapters of the EIAR.

The expected residual effects from demolition and construction activities, when considered alongside cumulative developments, have been assessed in Chapters 8 and 9 (air quality, noise, and vibration) and are found to be non-significant. Similarly, potential cumulative impacts on visual aesthetics, material assets, and traffic, as reviewed in Volume 3 of the EIAR and Chapters 11-13, are also anticipated to be non-significant.

Post-construction (operational phase), cumulative impacts from air quality, noise, visual impact, and traffic have been evaluated in Chapters 9-13, incorporating the potential effects of nearby developments into their modelling. These impacts are expected to be long-term, neutral, and not significant.

As detailed in Chapter 16, the residual cumulative impacts of the proposed development in conjunction with local committed developments are not expected to have a significant effect on unplanned events, human health, or safety during the operational phase.

4.7 "DO-NOTHING" IMPACT

To provide a comprehensive assessment of the proposed development, this section evaluates the potential impacts on the receiving environment if the project were not to proceed.

In a "do-nothing" scenario, the site would remain vacant and undeveloped, leading to an under-utilisation of this strategic location, particularly given its designation as a Strategic Development and Regeneration Area (SDRA 6 - Docklands) within the Dublin City Development Plan. Without development, the opportunity to achieve urban

regeneration, economic growth, and visual enhancement in this prominent area would be lost, missing a chance to align with city planning goals for sustainable and impactful urban development.

The absence of the proposed development would also mean forgoing the opportunity to address local demand for commercial space and job creation in a highly accessible area. The project's construction and operational phases are expected to stimulate employment growth, directly and indirectly benefiting local businesses, especially in the construction sector and service industries. In a "do-nothing" scenario, the local economy would miss out on these positive economic impacts, diminishing economic vibrancy and stalling the intended urban transformation.

Environmentally, leaving the site as-is would mean the current baseline remains unchanged. While this would avoid the temporary environmental impacts associated with construction, it would also forgo the lasting benefits of environmental enhancements and sustainable design features embedded in the proposed project. Moreover, without development, the derelict structures on the site would likely continue to deteriorate, impacting the townscape of this high-profile waterfront location. The decaying buildings would detract from the visual quality and coherence of the urban fabric, at odds with the regeneration objectives for the area and potentially inviting anti-social behaviour, which can be associated with neglected spaces.

The do-nothing scenario would also mean missed opportunities to enhance population dynamics, local employment, and community resources in alignment with the objectives of the City Development Plan. The public realm and community amenities envisioned for the site would remain unfulfilled, leaving a gap in the area's contribution to the cityscape and failing to support the projected growth of Dublin's Docklands.

In terms of natural progression without the project, baseline conditions regarding population, human health, and economic activity would likely remain largely static, with minimal change over time. The site would remain visually and functionally disconnected from Dublin's evolving urban landscape, missing an opportunity to contribute to the area's transformation into a vibrant, attractive, and sustainable part of the city core. In contrast, the proposed development offers a chance to reinvigorate the area, providing a well-integrated, high-quality urban environment with lasting benefits for the community and city alike.

4.8 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.

4.8.1 Construction Phase

A comprehensive range of construction-related mitigation and remedial measures are proposed throughout this EIAR to address potential environmental impacts across various topics and their inter-relationships. These measures are designed to avoid any significant adverse environmental effects on population and human health during the construction phase. For a summary of all proposed mitigation and remedial measures, readers are directed to Chapter 15 of this EIAR.

To protect the amenities enjoyed by nearby residents, businesses, and employees, the appointed contractor will submit and implement a Construction Environmental Management Plan (CEMP) prior to commencement. The CEMP will be based on the mitigation measures outlined in this EIAR and will address all relevant environmental controls and emergency procedures for the duration of the construction phase.

A Resource Waste Management Plan, prepared by Byrne Environmental Consulting Ltd., is included with this planning application. The plan's objective is to ensure that waste generated during both the construction and operational phases is managed and disposed of in compliance with the Waste Management Acts 1996-2023 and all associated Waste Management Regulations.

Prior to beginning demolition, the contractor must obtain formal agreement from the Local Authority regarding pollution prevention measures, as well as emergency procedures for all stages of construction. All demolition works will adhere to the following guidelines:

- BS 6187:2000 'Code of Practice for Demolition'
- Health and Safety Executive Guidance Notes GS 29/1, 2, 3, & 4
- S.I. 504 Safety, Health & Welfare at Work (Construction) Regulations 2013
- Air Pollution Act 1987

- Environmental Protection Agency Act 1992
- BS 5228:2009 Part 1 'Noise Control on Construction & Open Sites'

Additional site controls and measures include:

- Road Cleanliness: Roadways will be kept clean of dirt and debris, with a road-sweeping truck on standby if required.

- Site Security and Safety: The contractor will secure the site perimeter with appropriate hoarding and ensure all staff complete a site induction process. Safe pass cards will be required for all workers, and separate pedestrian access will be provided at main site entrances. Controlled access points, equipped with gates or turnstiles, will remain locked outside of monitored hours.

- Traffic Management: A Traffic Management Plan, to be agreed with Dublin City Council's Transportation Department and An Garda Síochána, will be implemented to mitigate potential impacts on surrounding road networks.
- Surface Water Management: In alignment with Sustainable Drainage Systems (SuDS) Best Management Practices, surface water proposals aim to reduce site runoff to 2 l/s. Measures include green roofs, stormwater attenuation, hydrobrake systems, and a Class 1 interceptor. The stormwater drainage system is designed for a 100-year storm event. Further details on surface water and flood risk are provided in Chapter 6 (Water and Hydrology).

- Dust Control: To mitigate dust-related health impacts, a dust minimisation plan will be implemented based on best practices from Ireland, the UK, and the USA. Additional details are provided in Chapter 8 of this EIAR.

- Noise and Vibration Control: Specific noise and vibration control measures are outlined in Chapter 9. The contractor will adhere to noise abatement guidelines per BS 5228–1 (BSI 2014a) and S.I. No. 241/2006 for outdoor equipment. Noise monitoring will follow ISO 1996–1 (ISO 2016) and ISO 1996–2 (ISO 2017), and operational plant items will comply with BS 4142 guidance for noise control.

These combined measures reflect a structured approach to managing environmental, safety, and operational impacts, ensuring compliance with best practices and relevant regulatory standards throughout the construction phase.

4.8.2 Operational Phase

Since the impacts of the proposed development on Human Health and Population are either non-significant, positive, or cannot be further mitigated, no additional mitigation measures are required.

4.9 RESIDUAL IMPACT OF THE PROPOSED DEVELOPMENT

4.9.1 Construction Phase

4.9.1.1 Human Health and Safety

The primary residual impact on air quality during demolition and construction is anticipated to come from construction dust and the potential for nuisance dust. However, with the implementation of the mitigation measures detailed in Chapter 8 of this EIAR, no residual air quality impact on human health is expected.

In terms of noise, while mitigation measures outlined in Chapter 9—such as selecting quieter equipment, controlling noise sources, implementing screening, limiting work hours, engaging with the public, and monitoring—will significantly reduce noise impacts, some residual noise may occur. During intrusive activities near the eastern site boundary, noise levels may intermittently reach up to 5 dB above the lower CNT of 70 dB LAeq,T at upper floors of the City Quay National School. This results in a temporary, moderate to significant residual negative impact during these specific periods. For most other construction activities, noise levels are expected to remain within acceptable limits, resulting in a moderate, short-term negative impact on nearby receptors.

In terms of health and safety, no significant residual impacts are anticipated from unplanned events or on-site health and safety during construction. With the application of measures outlined in Chapter 5 (Land, Soils, Geology, and Hydrogeology) and Chapter 6 (Hydrology), the likelihood of minor accidents, such as spills or leaks, is minimised, resulting in an imperceptible residual impact on the environment.

4.9.1.2 Economic Activity and Employment

The anticipated residual impact on businesses and residences during the demolition and construction phase of the proposed development is expected to be moderately positive and short-term, reflecting the temporary economic boost from construction activity and associated employment opportunities.
Local Amenities and Community Services

No significant residual impacts are anticipated on local amenities or tourism due to demolition or construction activities. Mitigation measures will be implemented to ensure that community services and tourism facilities remain unaffected by construction impacts.

With adherence to measures outlined in collaboration with Irish Water, the residual impact on material assets, such as water supply and wastewater infrastructure, is expected to be non-significant.

An analysis in Chapter 11 of this EIAR determined that additional traffic generated during demolition and construction will have no significant residual effect on local traffic conditions, as the road network can accommodate the increase without major disruptions.

4.9.1.3 Local Amenity & Community Infrastructure

No significant residual impacts are anticipated on local amenities or tourism due to demolition or construction activities. Mitigation measures will be implemented to ensure that community services and tourism facilities remain unaffected by construction impacts.

With adherence to measures outlined in collaboration with Irish Water, the residual impact on material assets, such as water supply and wastewater infrastructure, is expected to be non-significant.

An analysis in Chapter 11 of this EIAR determined that additional traffic generated during demolition and construction will have no significant residual effect on local traffic conditions, as the road network can accommodate the increase without major disruptions.

4.9.2 Operational Phase

4.9.2.1 Human Health and Safety

It is anticipated that there will be no significant residual impact on air quality affecting human health during the operational phase, as all air quality standards will be met without the need for additional mitigation.

In terms of noise, with the application of the design and mitigation measures outlined in Chapter 9, there will be no residual ~~noise~~noise, or vibration impacts on human health. The development's operations, including HVAC systems and any other potential noise sources, are designed to comply with noise standards to ensure a neutral impact on nearby sensitive receptors.

In relation to health and safety, the operational phase has been designed to adhere to robust safety protocols, with no significant residual impact anticipated from unplanned events or on human health and safety. The development will operate under comprehensive safety management systems to ensure continued protection of all users and the surrounding community.

4.9.2.2 Economic Activity and Employment

The residual impact of the operational phase on local businesses and residences is expected to be positive, significant, and long-term. The increased commercial activity will contribute to sustained employment opportunities and economic growth, enhancing the vibrancy of the local area.

4.9.2.3 Local Amenities and Community Services

The operational phase of the proposed development will have a positive, significant, and long-term residual impact on local amenities and tourism. The addition of cultural and commercial spaces will enhance the attractiveness of the area for visitors, supporting local tourism and adding value to the community amenities available.

The operational phase will not have a significant residual impact on material assets, including water, energy, and other essential services. These services have sufficient capacity to meet the demand generated by the development without negatively affecting existing infrastructure.

As outlined in Chapter 11, any additional traffic generated by the development during its operational phase is anticipated to have no significant residual impact on human health or local road conditions. The surrounding road network is equipped to handle the additional flow without notable disruptions.

While the playground of the nearby City Quay National School will not experience reduced sunlight during school hours, there will be a slight reduction in daylight levels to some classroom windows on the courtyard side. This decrease remains within Building Energy Rating (BER) VSC (Vertical Sky Component) targets, resulting in a slight, long-term negative impact on the affected classrooms.

According to the Pedestrian Wind Comfort Analysis, conducted by BPC Engineers, with implemented mitigation measures, ground-level wind conditions around the proposed development will be suitable for all pedestrian activities at all measurement locations throughout the year, with no adverse residual impact on pedestrian comfort during either summer or winter.

4.9.3 "Worst-Case" Scenario

If the proposed development does not proceed, no new commercial opportunities or local employment will be generated. However, the absence of the project or the failure of any proposed mitigation measures would not result in any severe, irreversible, or life-threatening outcomes. Therefore, no further consideration of this scenario is necessary with respect to health, community, employment, or population matters.

4.10 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.

4.11 REINSTATEMENT

This does not apply to the Population and Human Health chapter.

4.12 DIFFICULTIES ENCOUNTERED IN COMPILING

No significant difficulties were encountered in compiling this chapter of the EIAR document.

4.13 REFERENCES

- **Central Bank of Ireland, 2024.** *Quarterly Bulletin, Q3 2024.* Central Bank of Ireland.
- **Central Statistics Office, 2016**. *Census of Population 2016: CSO's PxStat Open Data Statistical Database.* Central Statistics Office.
- **Central Statistics Office, 2022.** *Census of Population 2022: CSO's PxStat Open Data Statistical Database.* Central Statistics Office.
- **Central Statistics Office, 2022**. *Labour Force Survey Quarter 2 2024*. Central Statistics Office.
- **Dublin City Council, 2022.** *Dublin City Development Plan 2022-2028.* Dublin City Council.
- **Economic and Social Research Institute. (2024)**. *Quarterly Economic Commentary, Autumn 2024.* Economic and Social Research Institute.
- **Environmental Protection Agency, 2022.** *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.* Environmental Protection Agency.

5.0 LAND, SOILS, GEOLOGY AND HYDROGEOLOGY

5.1 INTRODUCTION

This chapter of the EIAR evaluates the potential effects on the land, soil, geological and hydrogeological aspects of the site and surrounding area.

In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and predicted scale and duration of the likely effects.

This chapter has been prepared by Linganand Jewargi, Civil, Traffic and Transportation Engineer with Cronin & Sutton Consulting Engineers (CS Consulting) and Niall Barrett, Director of Cronin & Sutton Consulting Engineers (CS Consulting). Linganand holds BEng (Hons) and ME degrees in Sustainable Infrastructure from the Technological University of Dublin and is a member of the Institute of Engineers of Ireland. Niall's academic qualifications are Chartered Civil and Traffic and Transport Engineer B.Eng (Hons), CEng, M.I.E.I, Cert Health and Safety, Cert PSDP, Cert RSA and graduated from Napier University, Edinburgh. Upon graduating in 2005 Niall worked for a Traffic and Transport Engineering practice in Ireland for 8 years until 2013.

5.2 STUDY METHODOLOGY

5.2.1 Assessment Methodology

The assessment was carried out in accordance with the following best practice methodology and the following documents:

- Guidelines for the Preparation of Soil, Geology and Hydrogeology Chapters of Environment Impact Statements (Institute of Geologists of Ireland (IGI) 2013);
- Revised Guidelines on the information to be contained in Environmental Impact Statements (EPA 2015a);
- Advice notes for Preparing Environmental Impact Statements (EPA2015b);
- Guidelines on the information to be contained in Environmental Impact Assessment reports (EPA 2022);
- The Site Investigation Reports prepared by Site Investigations Limited.

This assessment takes into account both the significance of an element of the receiving environment and the magnitude of the potential environmental impacts that the proposed activities may have on it.

- The elements of the receiving environment (and impacts) to be assessed include the following:
- The extent of topsoil and subsoil cover and the potential use of this material on site or requirement to remove it off-site as waste for disposal and recovery;
- High yielding water supply springs/ wells in the vicinity of the site to within a 2Km radius and the potential for increased risk presented by the Proposed Development;
- Classification (regionally important, locally important) and extent of aquifers underlying the site perimeter area and increased risks presented to them by the Proposed Development associated with aspects such as for example removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes and/or change in groundwater quality;
- Natural hydrogeological/ karst features in the area and potential for increased risk presented by the activities at the site;
- Groundwater-fed ecosystems and the increased risk presented by operations both spatially and temporally; and,
- Presence of area of geological heritage and potential to impact on same.

5.2.2 Sources of Information

Desk-based geological information on the substrata (both Quaternary deposits and bedrock geology) underlying the area in which the site is located was obtained through accessing databases and other archives where available. Data was sourced from the following:

- The Geological Survey of Ireland (GSI) well card, groundwater body descriptions, aquifer type, vulnerability, groundwater boreholes, geological heritage database and source protection zones for the area were inspected,
- Teagasc soil and subsoil database;
- Environmental Agency (EPA) - website mapping and database information.

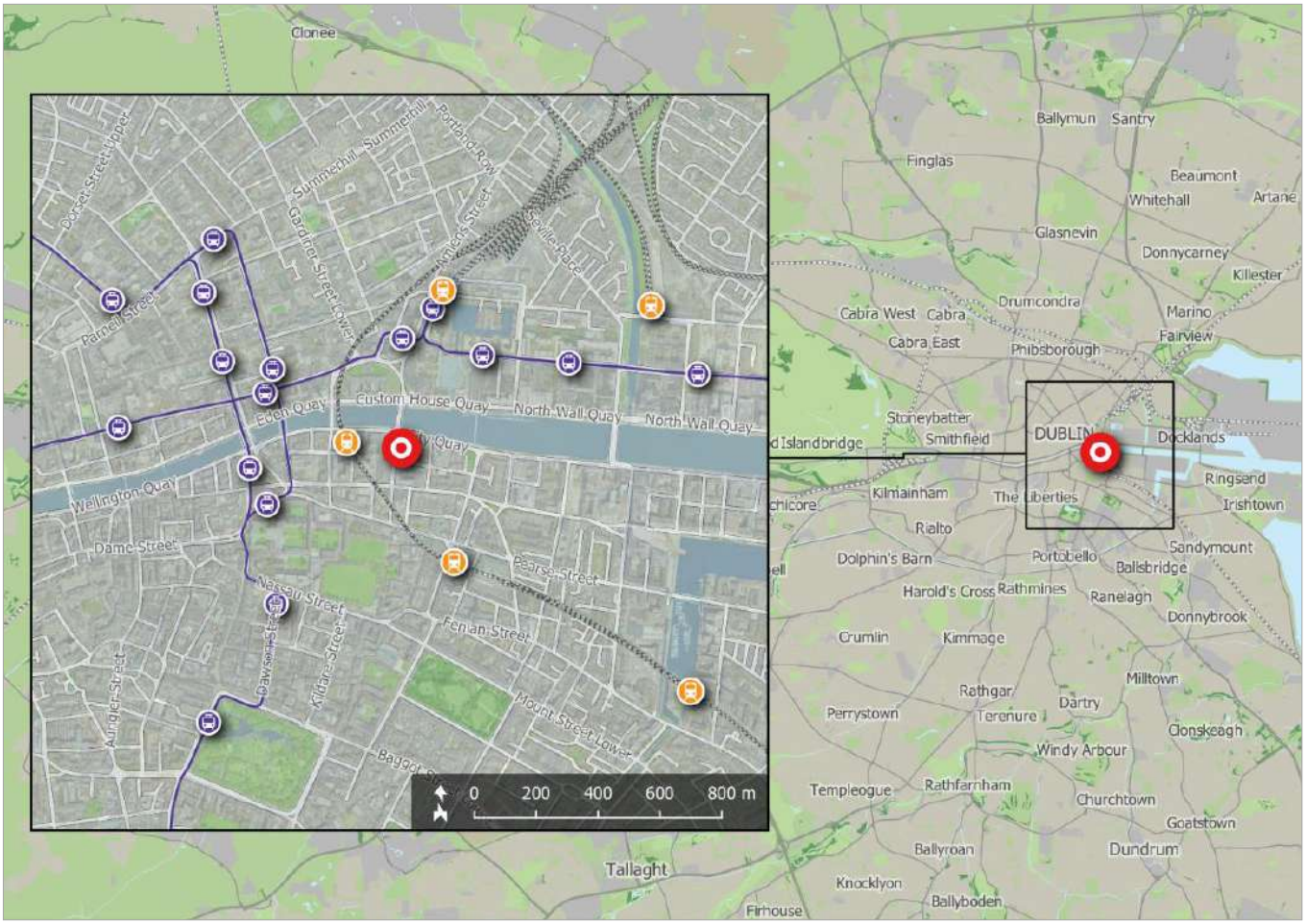
Information on the proposed design including civil engineering works is outlined in the planning drawings and the Engineering Services Report prepared by CS Consulting which is included with the planning submission.

5.3 RECEIVING ENVIRONMENT (BASELINE SITUATION)

5.3.1 Site Area Description

The site of the proposed development lies immediately to the south of the River Liffey. The lands primarily comprise the former City Arts Centre Building and associated hard standing bounded to the north by City Quay, to the west by Moss Street, and to the south by Gloucester Street South. The City Quay Covid testing centre and City Quay National school are situated along the eastern boundary of the subject lands.

Figure 5.1. Site Location



source: EPA, OSI, OSM Contributors, Google

The development site encompasses the existing registered addresses of 1-4 City Quay (D02 KT32) and 5 City Quay (D02 PC03). The site is located at the junction of City Quay and Moss Street the site extends to 0.22 hectares. The site is also bounded to the south by Gloucester Street South. This site is fully hardstanding. The location of the proposed development site is shown in **Error! Reference source not found.** above; the indicative extents of the development site, as well as relevant elements of the surrounding road network, are shown in more detail in Figure 5.2. **Error! Reference source not found.**

Figure 5.2. Site extents and Environs (approximate boundaries denoted with red below)

source: OSI, OSM Contributors, Google

5.3.2 Existing Site Condition

The subject development site is brownfield. Several derelict structures are present in the northern part of the site; the remainder comprises hardstanding that is currently in use as a commercial car park, accessed from City Quay.

The receiving environment in terms of land, soils, geology, and hydrogeology is described in the following sections.

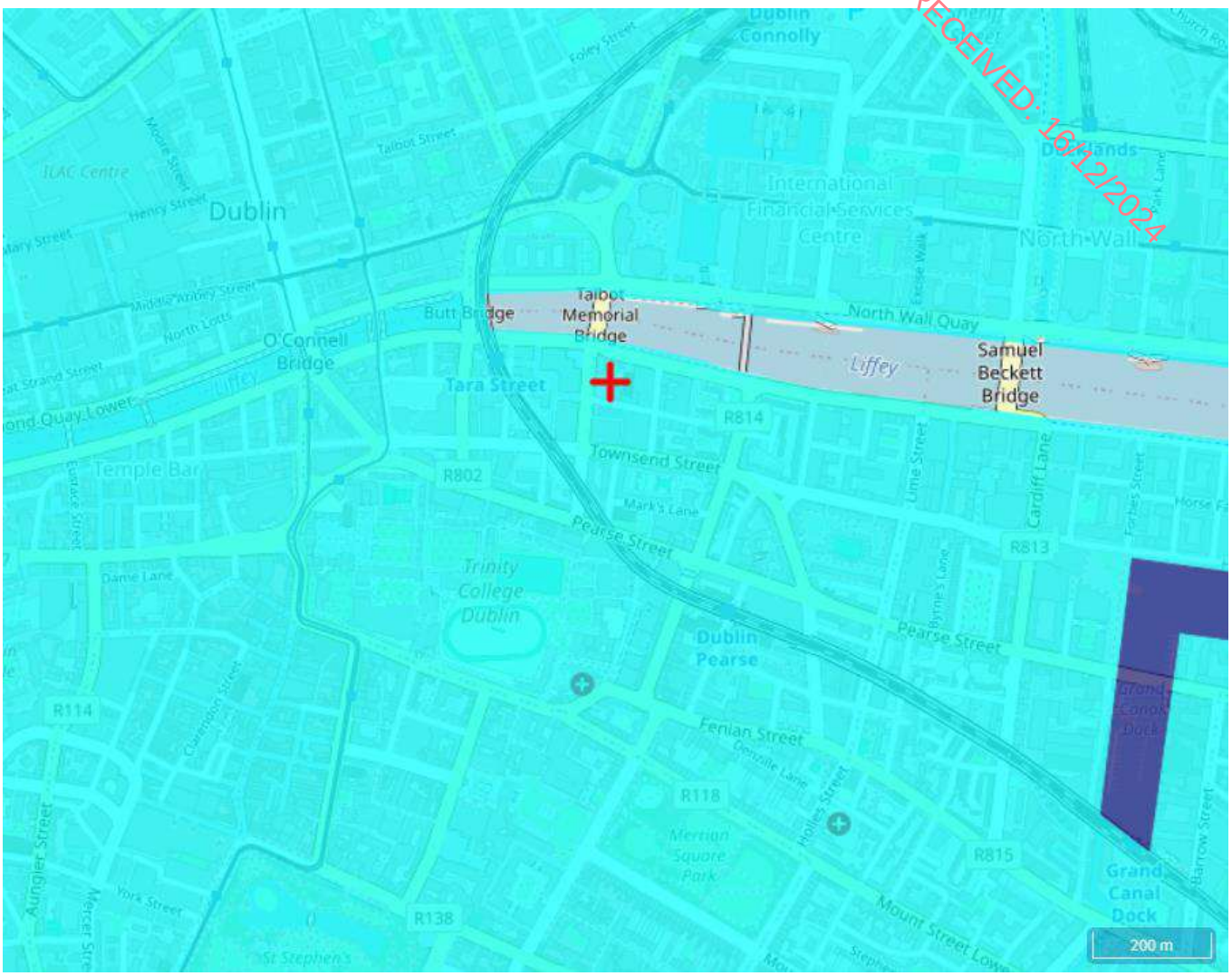
5.3.3 Topography

The topography of the proposed development site is generally flat with the elevation of the site ranging from 2.97mOD to 3.01 mOD.

5.3.4 Soils

Review of the soil maps from the EPA online map tool indicate that the soil type in the vicinity of the subject development site is predominantly Made Ground. Please refer to FIGURE.

Figure 5.3. Soils Map



source: EPA, OSM Contributors

5.3.5 Quaternary Deposits

The GSI bedrock map indicates that the majority of the site and surrounding area is underlain by Dark Limestone and Shale associated with the Lucan Formation. The subsoil is primarily made ground.

5.3.6 Site Investigations

2 no. site investigation reports have been extracted from DCC Planning reg. ref. 4672/22. The details of these site investigations are given below:

Site investigations were carried out in January 2020 by Site Investigations Limited (SIL). The fieldworks comprised the use of a cable percussive borehole. All fieldwork was carried out in accordance with the following relevant design standards:

- BS 5930:2015, Engineers Ireland GI Specification and Related Document 2nd Edition 2016
- Eurocode 7: Geotechnical Design.

Laboratory testing has been performed on representative soil samples recovered from the boreholes and these were completed in accordance of BS 1377: 1990.

Cable percussion boring was undertaken at 3 No. locations using a Dando 150 rig and constructed 200mm diameter boreholes. Prior to drilling commencing, a hand dug inspection pit was excavated to check for underground services.

The boreholes terminated at similar depths from 8.90mbgl (metres below ground level) to 9.1 0mbgl when obstructions were encountered. Bulk disturbed samples were recovered at regular intervals and returned to SIL for laboratory testing.

A second round of site investigations were carried out in April and May 2022 by Ground Investigations Ireland (GII). The purpose of these site investigations was to investigate subsurface conditions. The scope of the works for the April and May investigations undertaken for this project included the following and these are in addition to January 2020 investigations:

- Carry out 3 no. rotary core boreholes to a maximum depth of 12.30m BGL
- Installation of 3 no. groundwater monitoring wells, 3 no. groundwater data loggers and 1 no. barologger
- Groundwater laboratory testing.

Please refer to Appendix 5.1 for details of site investigations undertaken.

5.3.6.1 Ground Types encountered during Site Investigations

As noted above, site investigations were undertaken in 2020 and 2022 by Site Investigations Limited and Ground Investigations Ireland respectively. Below is a summary of ground types encountered in the exploratory holes, in approximate stratigraphic order.

- Surfacing: encountered in all the exploratory holes and was present to a maximum depth of 0.15m BGL.
- Made Ground: encountered beneath the surfacing and was present to a depth of between 2.8 and 3.8m BGL generally, with possible made ground noted to a maximum depth of 5.3m BGL. Made ground deposit were described as brown/grey clayey gravelly SAND with frequent red brick and concrete fragments on greyish brown sandy gravelly CLAY with organic matter.
- Granular Deposits: the granular deposits were generally described as grey slightly clayey slighty sandy subrounded to rounded fine to coarse GRAVEL. The granular deposits varied in depth around the site.
- Cohesive Deposits: the cohesive deposits were generally described as grey sandy gravelly CLAY. The strength of the cohesive deposits was generally stiff from a depth of 3.8m BGL.
- Bedrock: The rotary core boreholes recovered Weak to Medium Strong to Strong thinly laminated grey fine to medium grained LIMESTONE interbedded with weak to medium strong thinly laminated fine0grained Mudstone. The depth to rock varies from 8.3m BGL to a maximum of 9.8m BGL.

5.3.6.2 Environmental Quality

Soil samples were collected during the 2020 ground investigations. Environmental testing was carried out on three samples from the investigation to determine if the material is hazardous or non-hazardous and then the leachate results were compared with the published waste acceptance limits of BS EN 12457 -2 to determine whether the material on the site could be accepted as 'inert material' by an Irish landfill.

The Waste Classification report created using HazWasteOnline ™ software shows that the material tested is classified as hazardous material. All three samples recorded elevated levels of lead with BH01 and BH03 recording elevated levels of zinc. A trace sample of chrysotile (white asbestos) was present in the soil sample extracted from BH02.

It is recommended that any MADE GROUND excavated on site should be stockpiled separately to natural soils to avoid any potential cross contamination of the soils prior to removal from site.

5.3.6.3 Groundwater Conditions

Groundwater details in the borehole during the fieldworks are noted on the log in Appendix 5.1. At the end of the completed fieldwork, the highest water level was recorded at 3.0m BGL.

As part of site investigations carried out in 2022 by GII, standpipes were installed in each of the boreholes to allow the equilibrium groundwater level to be determined. Groundwater levels across the site are generally 3.29m BGL to 3.78m BGL. There is no apparent tidal influence on the groundwater levels at the site.

5.3.6.4 Groundwater Quality

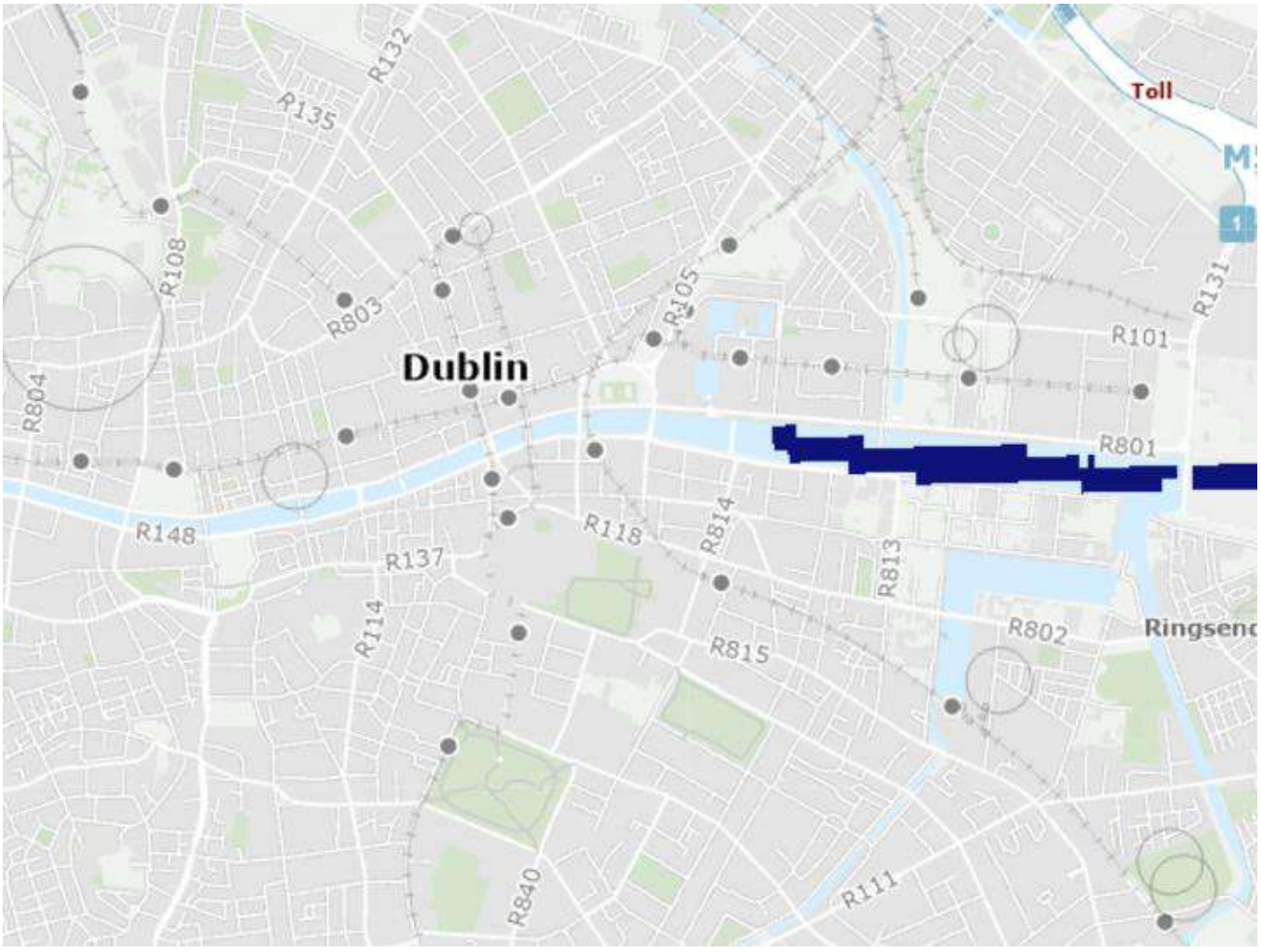
As part of site investigations carried out in 2022 by GII, 3no. groundwater monitoring wells were installed to examine the underlying groundwater quality at the site by GII under the supervision of Byrne Looby.

Groundwater samples were collected from each of the groundwater monitoring wells that was installed within the proposed development site. Therefore, three (3) no. groundwater samples were collected in total. Overall, the groundwater sample was found to be within the permissible parameters for the presence of metals and volatile organic compounds. The groundwater sample from BH01 was found to contain an EPH concentration of 3,330 ug/l which exceeds the EPA Interim Guidance value. Additionally, high concentrations of chloride, sodium and sulphate were encountered at BH02 and BH03.

5.3.7 Groundwater Wells

The GSI provides a record of wells drilled in Ireland. The information provided by GSI shows that the most proximate wells to the subject development site are located approximately 1000m to the east of the proposed development, 1100m to the west of the development site and 850m to the north-west of the proposed development.

Figure 5.4. Wells and Springs in the vicinity of the proposed development



source: GSI

5.3.8 Aquifer Classification and Water Body Status

Groundwater can be defined as water that is stored in, or moves through, pores and cracks in sub-soils. Aquifers are rocks or deposits that contain sufficient void spaces, and which are permeable enough, to allow water to flow through them in significant quantities.

The major bedrock aquifer underlying the site has been classified by GSI as a Locally Important (Lg) Gravel Aquifer which is moderately productive in local zones only.

In addition, no groundwater source protection zones, which are zones defined by the GSI within which development is limited in order to protect groundwater from potential pollution, are identified by the GSI under the site or in the immediate vicinity. There are no karst features in the area.

5.3.9 Aquifer Vulnerability

GSI maps indicate that the aquifer vulnerability is considered 'Low'.

5.4 DO NOTHING SCENERIO

Should the proposed development not take place, the land, soils, geology and hydrogeology will remain in their current state. The site will remain as a brownfield development.

5.5 CHARACTERSISTICS OF THE PROPOSED DEVELOPMENT

The proposed building extends to 14 floors above ground floor and also contains 2no. basement levels. The building structure is reinforced concrete columns with flat-slab post-tensioned floors on foundations bearing on rock. It is proposed to construct 2 basement levels, the lower of which provides 11 car parking spaces including 2 disabled accessible spaces and 3 motorbike spaces. A detailed development description is provided in Chapter 2 (Description of the Proposed Development). The characteristics of the proposed development with regard to the land, soil, geological and hydrogeological environment are outlined below.

5.5.1 Construction Activities

- Site clearance and enabling works.
- Additional removal of shallow made ground and superficial deposits for foundations and civil engineering works.
- Excavation for two (2) no. basement levels.
- Temporary storage of fuel will be required on site for construction traffic.
- Small localised accidental releases of hydrocarbons have the potential to occur from construction traffic operating on site.
- Dewatering is anticipated to be required for construction as excavation into underlying subsoil (water bearing strata) will be required for the basement.

5.5.2 Operational Activities

- Surface Water - There will be no direct discharges to ground required for operation of the facility.
- Water supply - Water supply will be supplied from public mains – it is not proposed to extract water from groundwater resources
- Foul Drainage – Foul drainage shall discharge to the public sewer.

5.6 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

5.6.1 Interactions considered

The lands soil and geology impacts are considered to interact with the following EIAR chapters:

- Chapter 6 – Water and Hydrology
- Chapter 12 – Waste

5.6.2 Construction Phase

Potential impacts considered during construction are as follows:

Excavation and Infilling

Excavated and stripped soil can be disturbed and eroded by site vehicles during the construction. Rainfall and wind can also impact on non-vegetated/uncovered areas within the excavation or where soil is stockpiled.

Excavation and infilling of soil and subsoil will be required for levelling of the site to render it suitable for building the building platform. The volume of material to be excavated has been estimated by the project engineers to be approximately 25,000m3 of material. It is proposed to stockpile suitable excavated material for reuse as fill where possible. Any materials which are not reused as fill shall be removed off-site for appropriate reuse, recovery and / or disposal.
These estimates will be refined prior to commencement of construction. If the material that requires removal from site is deemed to be a waste, removal and reuse/recycling/recovery/disposal of the material will be carried out in accordance with the 'Waste Management Act 1996' (as amended), the 'Waste Management (Collection Permit) Regulations 2007' as amended, and the 'Waste Management (Facility Permit & Registration) Regulations 2007' as amended.

It is likely that excavated material will be taken off site. When this material is removed off-site it could be reused as a by-product (and not as a waste). In order to reuse material as a byproduct it must be classified in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011.

Waste material will need to be classified as hazardous or non-hazardous in accordance with the EPA publication 'Waste Classification - List of Waste and Determining If Waste is Hazardous or Non-Hazardous'. It is likely that the surplus of material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities/landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment/recovery or exported abroad for disposal in suitable facilities. However, more soil sampling will be required as part of the construction program to know the extent of the asbestos material.
The asbestos material will be appropriately segregated and disposed off to a licenced hazardous landfill by a licenced contractor.

Basement Construction

The DCC Development Plan 2022-2028 (Appendix 9 – Basement Development Guidelines) presents a methodology where the impact of basement on the surrounding ground and groundwater is assessed on a site-specific basis. This policy sets out the requirements to complete this risk-based impact assessment with regard to hydrology, hydrogeology and land stability.

An impact assessment (refer to section 5.7.1 below) was undertaken to assess the likely impact on the existing water regime during and post construction of a basement within the proposed development. The objective is to ensure that the basement development:

- Protects and enhances where possible the groundwater quality, quantity and classification.
- Provides evidence that the construction of the basement shall not place groundwater at undue risk.
- Provides evidence that the structural stability of adjoining or neighbouring buildings and land areas are not put at risk.
- Provides a management plan for any demolition works and for the construction of the basement.
- Does not have an adverse effect on existing patterns of surface water drainage.
- Shall not significantly impact on groundwater or surface water flows to the extent that this is likely to increase the risk of flooding.
- Ensures appropriate handling and dealing with waste removal.
- Conserves and where possible enhances the biodiversity value of the site.

A full site investigation was carried out by SIL in 2020 and then by GII in 2022. A specialist ground works contractor (piling contractor) will be appointed to carry out the excavation. There will be local rock breaking required due to the level of the tanks located below the basement. For the rest of the site, due to the depth of the bedrock being approx 10 metres below ground level, it is not envisaged the rock breaking is required and foundations can be supported on the rock layer. The appointed specialist contractor will carry out a full risk assessment prior to the commencement of work.

A ground works operation will be carried out in order to ensure that material removed from the ground is taken away at regular intervals in order to reduce the amount of material that will be stored on site.

The site level will be graded to a uniform level following demolition and removal of the building foundations and redundant services. It shall be ensured that no water runoff from the development site exits to the public street.

The main construction works following demolition shall be installation of an embedded pile retaining wall to facilitate the excavation and construction of the proposed basement. The following is a high-level sequence of the main construction works which shall take place following demolition of the existing buildings on site:

- A suitable piling platform shall be designed and installed to support the piling rig.
- The embedded pile retaining wall will be constructed around the site boundary, to facilitate deep excavation. This will involve the installation of augered or bored piles. The augering of the piles will generate spoil that must be disposed at an appropriate licensed facility off-site. The spoil shall be stockpiled on site ahead of disposal. WAC testing will be carried out an all-excavated material including pile arisings to determine requirements for reuse/disposal.
- The concrete operations associated with the pile wall construction will require concrete and steel reinforcement deliveries to site which will be managed in accordance with the Contractors Construction Management Plan. Pile reinforcement cages can be stored on site and concrete deliveries managed within the site footprint.
- Following installation of the pile wall, excavation of the basement will commence. This excavation phase shall be informed by a detailed phase of site investigation and chemical testing of the soils to develop a phased dig plan for the site. Any contamination identified during the investigation phase and subsequently the excavation phase will be segregated, removed and disposed in an appropriate registered facility. Any Made Ground excavated on site should be stockpiled separately to natural soils to avoid any potential cross contamination of the soils prior to removal from site.

The basement excavation shall be dewatered through settlement tanks and discharged after appropriate treatment into the local drainage network infrastructure. Outfall manholes will be regularly emptied of sediment during periods of heavy rainfall. These measures will prevent run-off from the site and total suspended solid levels in all discharge shall be in compliance with the Quality of Salmonid Water Regulations (SI 293:1988).

On completion of the excavation works to the formation level of the basement slab, this will be blinded to the final design levels. Any below ground services will be installed and tested within the basement slab. Prior to construction of the foundations and suspended slab at the lower basement level, a proprietary basement tanking system and water bar will be installed at all construction joints. A typical basement slab
construction is as follows:

- Trim & grade to slab formation with appropriate material.
- Cast mass concrete blinding
- Apply waterproof membrane and tanking.
- Apply continuous waterproof tanking material and seal all laps (and along perimeter of secant wall/slab junction).
- Install slab reinforcement to slab area (including any columns and wall starters) Formwork to perimeter and any box-outs necessary (e.g. around raking props).
- Pour concrete following inspection.

When a sufficient area of basement slab is constructed and sufficient concrete curing time has been allowed, the vertical elements can be constructed.

Once piling is installed, there will be limited groundwater to dewater due to the enclosing of potential water bearing strata.

The potential impacts of the basement construction include:

- A local impact may occur during the initial excavation stages until the piling wall is fully installed. Once the wall is embedded into the rock, horizontal water flow from the water-bearing gravel layer (or other strata) will be

blocked. Dewatering may be required for other inflows such as rainwater. The regional water table within bedrock will not be affected by the planned basement construction. The effect on the shallow water table will at most be temporary. The basement is estimated to be completed within approximately 16-20 weeks.

- The proposed development will not increase the hardstanding area, ensuring that groundwater recharge and the groundwater regime remain unaffected.
- The proposed basement construction, which would involve c. 9.5-13.5-metre-deep excavations has the potential to cause minor ground movements inside the excavated area as a result of changes in vertical load on the ground. The construction sequence was developed to control any potential movement to within acceptable limits. Due to the presence of the piling wall surrounding the excavation there is no potential ground movements outside the excavation area.
- There is no source-pathway-receptor hydrogeological connection between the subject site and Dublin Bay through the Dublin aquifer as vertical migration to the underlying limestone bedrock is minimised due to the thickness of overburden ('Low' vulnerability) present at the site providing a high level of aquifer protection from any potential source. Therefore, no likely impact on the status of the aquifer is expected due to natural attenuation within overburden and reducing potential for off-site migration.

Accidental Spills and Leaks

Accidental spills and leaks of oils or fuels represent a risk of pollution if mitigation measures are not put into place on site. Spillage may occur due to refuelling of machinery, spillage of fuels stored on site or leakage of fuels from construction machinery.

5.6.3 Operational Phase

There will be no direct discharges to the water or soil environment during the operational phase.

Any accidental emissions during storage, transfer, or delivery or leakage in the car parks could cause localised contamination if the emissions enter the soil and groundwater environment. without adequate mitigation. However, it is noted that any accidental discharge will more likely impact stormwater drainage due to the hardstand and drainage infrastructure proposed.

The site is currently consisting of hardstanding area. The use of SUDs techniques will have a minor positive effect on local recharge to ground. It is proposed that the surface water drainage will be upgraded to facilitate the proposed development, refer to Chapter 8 Hydrology for further
information on the drainage system.

5.7 REMEDIAL AND MITIGATION MEASURES

Mitigation Measures have been included within the design and the CEMP to take account of the potential impacts of the development on the receiving land, soils, geology, and hydrogeology environment. These measures shall minimise potential effects through the implementation of best practice construction methods and adherence to all relevant legislation.

Due to the inter-relationship between land, soils, geology and hydrogeology and water (hydrology) the following mitigation measures discussed will be considered applicable to both.

5.7.1 Construction Phase

A project-specific Outline Construction and Environmental Management Plan (CEMP) has been prepared by CS Consulting and is submitted as part of this planning application. Prior to commencement of construction this CEMP will be updated and will be maintained by the contractors during the construction and operational phases. The CEMP will cover all potentially polluting activities and include an emergency response procedure. All personnel working on the site will be trained in the implementation of the procedures.

Soil handling, Removal and Compaction

Three soil samples were collected from the site, and the soil was classified as hazardous due to elevated levels of lead and zinc. Additional soil sampling and testing (including WAC testing) will be necessary if any soil is to be

removed from the site for reuse or disposal. Any soil designated for removal will be handled and disposed of by a licensed contractor at a licenced facility

Temporary storage of soil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment and the material will be stored away from any surface water drains. Made ground shall be stockpiled separately to natural soils and stones in order to prevent cross-contamination of excavated materials on site. Movement of material will be minimised in order to reduce dust and degradation of soil structure.

Basement Assessment

The following mitigation measures will be included in the design to protect water quality:

Any minor ingress of groundwater and collected rainfall in the excavation will be pumped out during construction. It is proposed that the water be discharged via the existing stormwater sewer network. The use of silt traps, settlement tanks and an oil interceptor (if required) will be adopted if monitoring indicates the requirements for the same with no silt or contaminated water permitted to discharge to the sewer.

Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility offsite.

An Outline Construction and Environmental Management Plan (CEMP) has been prepared by CS Consulting Engineers as part of the planning application. Prior to commencement of construction the appropriate contractor will produce a detailed CEMP which will include management of any collected water.

Appropriate instrumentation will be installed to monitor wall and ground movements during construction. The predictions of ground movement based on the ground movement analysis should be checked by monitoring the basement wall. The monitoring will include the installation of inclinometers in the basement wall elements so the pattern of wall behaviour can be reviewed with predicted values and due to the presence of residential dwellings and protected structures close to the site boundary. Contingency measures will be implemented if movements of the adjacent structures exceed predefined trigger levels.

In cases where vibration from construction methods could potentially damage sensitive neighbouring buildings and structures vibration monitors are to be installed. Contingency measures will be implemented if monitored vibrations exceed predefined trigger levels.

It is considered that there is a low risk of inflow during construction works due to the installation of piles into bedrock prior to excavation works on the basement.

The proposed basement will have no long-term impact on water levels in the overburden or underlying aquifer and no impact on the current water body status. The bedrock water table will not be affected by the excavation works. Temporary dewatering of the perched water table within the clayey deposits to facilitate excavation works is expected to be minor and it will have a temporary local impact only.

The basement will need to be fully waterproofed to ensure no groundwater enters the finished basement.

Management of any collected rainwater and any groundwater seepage during basement excavations will be pumped to existing sewers (following appropriate treatment) in agreement with the regulatory authority.

Fuel and Chemical Handling

All oils, solvents and paints used during construction will be stored within temporary bunded areas; these areas shall be bunded to a volume of 110% of the capacity of the largest tank/container.

To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents, and paints used during construction will be stored within temporary bunded areas. Oil and fuel storage tanks shall be stored in designated areas. Oil storage tanks should have secondary containment provided by means of an above ground bund to capture any oil leakage irrespective of whether it rises from leakage of the tank itself or from associated

equipment such as filling and off-take points, sighting gauges etc., all of which should be located within the bund. Bund specification should conform to the current best practice for oil storage (Enterprise Ireland BPGC5005).

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

All ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil. The pouring of concrete will take place within a designated area using a geosynthetic material to prevent concrete runoff into the soil/groundwater media. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility offsite.

Pouring of concrete should be carried out in the dry and allowed to cure. Mixer washings and excess concrete should not be discharged to surface water. Implementation of comprehensive and strict site housekeeping measures to isolate concrete from local surface waters is essential.

In the case of drummed fuel or other chemical which may be used during construction containers will be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of a spillage.

5.7.2 Operational Phase

During operation measures there is no requirement for bulk fuels. There is also no requirement for discharge to ground and no requirement for abstraction of groundwater. An environmental management plan will apply to the development during the operational phase incorporating mitigation measures and emergency response measures.

5.7.2.1 Management of Surface Water during Operation

The proposed development will provide full attenuation system, green blue roofs, and blue roofs, for the hardstand areas in compliance with the requirements of the Greater Dublin Strategic Drainage Study and Dublin City Council Development Plan. The proposed surface water drainage service to the development comprises various drainage components including positive stormwater networks, attenuation systems and several Sustainable Drainage Systems (SuDS) elements. The proposed surface water drainage was designed in accordance with the SuDS Manual 2015. This is further detailed in Chapter 6 Hydrology of this EIA Report.

5.8 RESIDUAL IMPACT OF THE PROPOSED DEVELOPMENT

There are no likely significant impacts on the land, geological or hydrogeological environment associated with the proposed operational development of the site following implementation of the proposed mitigation measures.

The appropriate mitigation measures set out in see Section 5.6 reduce the potential for any impact of accidental discharges to ground during the construction phase. Overall, the construction phase is considered to have a short term, imperceptible significance, with a neutral impact on quality.

The predicted impact during operations is considered to be long term, neutral in terms of quality and of an imperceptible significance as a result of this proposed development on the surrounding land, soils, geology, and hydrological environment.

5.9 MONITORING OR REINSTATEMENT

5.9.1 Construction Phase

Regular inspection of surface water run-off and sediments controls e.g. silt traps and settlement tanks will be employed during the construction phase. Soil sampling to confirm disposal options for excavated soils. Regular inspection of construction/mitigation measures will be undertaken e.g. concrete pouring, refuelling etc.

5.9.2 Operational Phase

There is no monitoring required during the operational phase.

5.10 CUMULATIVE IMPACT OF THE PROPOSED DEVELOPMENT

The cumulative impact of the Proposed Development with any/all relevant other planned or permitted developments are discussed below. Related and permitted, concurrent, and future developments are listed in Chapter 2 (Description of the Proposed Development).

5.10.1 Construction Stage

In relation to the potential cumulative impact on the geological or hydrogeological environment during the construction phases, those key engineering works which would have additional impacts are:

- Run-off with high silt content could damage surface water systems and result in a negative impact on receiving watercourses. To mitigate this, run-off from the development and other permitted projects will need to be managed using methods outlined within section 5.7.1 above.
- There is also a risk of soil and groundwater contamination beneath the site due to accidental spills or leaks from construction traffic and materials. To address this, project-specific Construction Environmental Management Plans (CEMPs) will be developed and implemented for the Proposed Development and any future developments in line with the measures outlined in section 5.7.1 above.

The proposed development does require dewatering and with standard mitigation in place (as outlined in Section 5.6) for management of construction water, accidental discharges, the effect due to construction in this area is considered to be neutral on groundwater and soil quality and an imperceptible significance.

Contractors for the proposed development will be contractually required to operate in compliance with a CEMP which will include the mitigation measures outlined in this EIA report. Other developments will also have to incorporate measures to protect soil and water quality in compliance with legislative standards for receiving water quality. As a result, there will be no cumulative potential for change in soil quality or the natural groundwater regime. The cumulative impact is considered to be neutral and imperceptible.

5.10.2 Operational Phase

In relation to the potential cumulative impacts from the operational stages, the following would apply:

Overall, there will no change in recharge pattern as there is no increase in hardstand from the proposed development and surrounding planned or permitted developments. Therefore, there will be no overall change on the groundwater body status. There is no requirement for bulk fuel storage at the proposed development.

Localised accidental discharge of hydrocarbons could occur in car parking areas and along roads unless diverted to surface water drainage system with petrol interceptors. However, all developments are required to ensure they do not have an impact on the receiving water environment in accordance with the relevant legislation (primarily the European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S. I. No. 9 of 2010) as amended by S. I. No. 366/2016) such that they would be required to manage runoff and fuel leakages.

As such there will be no cumulative impact to groundwater quality. The cumulative impact is concluded to have a long-term, imperceptible significance with a neutral impact on soil and water quality.

The land is commercial, and the development is considered commercial therefore the cumulative impact on the land is considered to be long-term, imperceptible significance with a neutral impact.

5.11 DIFFICULTIES ENCOUNTERED IN COMPILING INFIRMATION

There were no difficulties encountered during the writing of this EIAR chapter.

5.12 REFERENCES

- **Department Housing, Local Government and Heritage, 2018.** *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.* Environmental Protection Agency. The Department Housing, Local Government and Heritage.
- **Dublin City Council, 2022**. *Dublin City Development Plan 2022-2028 (Appendix 9: Basement Development Guidelines)*. Dublin City Council.
- **Environmental Protection Agency, 2022.** *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.* Environmental Protection Agency.
- **Environmental Protection Agency, 2015a**. *Revised Guidelines on the Information to be contained in Environmental Impact Statements*. Environmental Protection Agency.
- **Environmental Protection Agency, 2015b**. *Advice notes for Preparing Environmental Impact Statements*. Environmental Protection Agency.
- **Institute of Geologists of Ireland, 2013a**. *Guidelines for the Preparation of Soil, Geology and Hydrogeology (Chapters of Environment Impact Statements).*
- **Institute of Geologists of Ireland, September 2013b.** *Geology in Environmental Impact Assessments, A Guide*, University College Dublin.
- **Institute of Geologists of Ireland, 2002**. *Geology in Environmental Impact Assessments, a Guide,* University College Dublin.

APPENDIX 5.1

AVAILABLE BOREHOLE LOGS (SII, 2020 & GII, 2022)

Contract No: 5686	**Cable Percussion Borehole Log**				Borehole No: **BH01**
Contract:	City Quay	Easting:	716399.437	Date Started:	28/01/2020
Location:	City Quay, Dublin 2	Northing:	734389.391	Date Completed:	29/01/2020
Client:	City Arts and City Quay Partnership	Elevation:	2.97	Drilled By:	J. O'Toole
Engineer:	-	Borehole Diameter:	200mm	Status:	FINAL

Depth (m) Scale	Depth	Stratum Description	Legend	Level (mOD) Scale	Depth	Samples and Insitu Tests Depth	Type	Result	Water Strike	Backfill
	0.20	MADE GROUND: concrete.			2.77					
0.5		MADE GROUND: brown grey slightly sandy slightly gravelly silty clay with much red brick and concrete content.		2.5		0.50	ES	JOT01		
1.0				2.0		1.00	B	JOT02		
						1.20	C	N=5 (0,1/1,1,1,2)		
1.5	1.50	MADE GROUND: grey silty sandy gravel with much red brick and concrete content.		1.5	1.47					
2.0				1.0		2.00	B	JOT03		
						2.00	C	N=7 (0,0/1,2,2,2)		
2.5				0.5						
	2.80	Medium dense silty very gravelly SAND with low cobble content.		0.0	0.17	3.00	B	JOT04		
3.0						3.00	C	N=10 (1,1/2,2,3,3)		
3.5				-0.5						
4.0				-1.0		4.00	B	JOT05		
						4.00	C	N=14 (2,2/3,3,4,4)		
4.5				-1.5						
5.0				-2.0		5.00	B	JOT06		
						5.00	C	N=19 (2,3/4,5,5,5)		
5.5	5.60	Firm grey sandy slightly gravelly clayey SILT.		-2.5	-2.63					
6.0				-3.0		6.00	B	JOT07		
						6.00	C	N=12 (2,2/3,3,3,3)		
6.5				-3.5						
7.0	7.00	Stiff grey slightly sandy slightly gravelly silty CLAY with low cobble content.		-4.0	-4.03	7.00	B	JOT08		
						7.00	C	N=24 (2,4/5,5,7,7)		
7.5				-4.5						
	7.80	Very stiff black slightly sandy slightly gravelly silty CLAY with low cobble content.			-4.83					
8.0				-5.0		8.00	B	JOT09		
						8.00	C	N=33 (4,5/6,7,9,11)		
8.5	8.50	Grey slightly sandy gravelly silty CLAY with high cobble content.		-5.5	-5.53					
	8.90				-5.93					
9.0	9.00	Obstruction - possible boulders. End of Borehole at 9.00m		-6.0	-6.03	9.00	C	50 (25 for 5mm/50 for 0mm)		
9.5				-6.5						

Chiselling:

From:	To:	Time:
1.60	1.80	00:45
7.80	7.90	00:45
8.90	9.00	01:00

Water Strikes:

Strike:	Rose:	Depth Sealed
4.80	4.10	NS
8.00	4.70	NS

Water Details:

Date:	Hole Depth:	Water Depth:
28/01	5.00	4.80
29/01	5.00	4.60
29/01	9.00	3.00

Installation:

From:	To:	Pipe:

Backfill:

From:	To:	Type:
0.00	9.00	Arisings

Remarks:

Hand dug inspection pit to 1.20mbgl.
Borehole terminated due to obstruction.

Legend:
B: Bulk
D: Disturbed
U: Undisturbed
ES: Environmental
W: Water
C: Cone SPT
S: Split spoon SPT

Contract No: 5686	**Cable Percussion Borehole Log**				Borehole No: **BH02**
Contract:	City Quay	Easting:	716398.885	Date Started:	29/01/2020
Location:	City Quay, Dublin 2	Northing:	734359.594	Date Completed:	30/01/2020
Client:	City Arts and City Quay Partnership	Elevation:	3.04	Drilled By:	J. O'Toole
Engineer:	-	Borehole Diameter:	200mm	Status:	FINAL

Depth (m) Scale	Depth	Stratum Description	Legend	Level (mOD) Scale	Depth	Samples and Insitu Tests Depth	Type	Result	Water Strike	Backfill
	0.20	MADE GROUND: concrete.			2.84					
0.5		MADE GROUND: brown grey slightly sandy slightly gravelly silty clay with much red brick and concrete content.		2.5		0.50	ES	JOT10		
1.0	1.10			2.0	1.94	1.00	B	JOT11		
1.5		MADE GROUND: grey silty sandy gravel with much red brick and concrete content.		1.5		1.20	C	N=18 (2,4/5,6,3,4)		
2.0				1.0		2.00	B	JOT12		
2.5				0.5		2.00	C	N=15 (2,2/3,3,4,5)		
	2.80				0.24					
3.0		Loose becoming medium dense slightly silty very sandy fine to coarse GRAVEL with low cobble content.		0.0		3.00	B	JOT13		
3.5				-0.5		3.00	C	N=7 (1,1/1,2,2,2)		
4.0				-1.0		4.00	B	JOT14		
4.5				-1.5		4.00	C	N=24 (2,4/5,5,7,7)		
	4.80				-1.76					
5.0		Firm grey slightly sandy slightly gravelly clayey SILT.		-2.0		5.00	B	JOT15		
5.5				-2.5		5.00	C	N=10 (1,2/2,2,3,3)		
	5.60				-2.56					
6.0		Dense brown silty very sandy GRAVEL with low cobble content.		-3.0		6.00	B	JOT16		
6.5				-3.5		6.00	C	N=34 (4,7/7,9,8,10)		
7.0				-4.0		7.00	B	JOT17		
7.5				-4.5		7.00	C	50 (8,17/50 for 100mm)		
8.0				-5.0		8.00	B	JOT18		
8.5				-5.5		8.00	C	50 (10,15/50 for 125mm)		
	8.80				-5.76					
9.0	8.90	Obstruction - possible boulders. End of Borehole at 8.90m		-6.0	-5.86	8.90	C	50 (25 for 5mm/50 for 0mm)		
9.5				-6.5						

Chiselling:

From:	To:	Time:
2.70	2.80	00:45
7.30	7.40	00:45
8.80	8.90	01:00

Water Strikes:

Strike:	Rose:	Depth Sealed
5.60	5.10	NS
6.50	5.50	NS

Water Details:

Date:	Hole Depth:	Water Depth:
29/01	3.00	Dry
30/01	3.00	Dry
30/01	8.90	3.80

Installation:

From:	To:	Pipe:

Backfill:

From:	To:	Type:
0.00	8.90	Arisings

Remarks:

Hand dug inspection pit to 1.20mbgl.
Borehole terminated due to obstruction.

Legend:
B: Bulk
D: Disturbed
U: Undisturbed
ES: Environmental
W: Water
C: Cone SPT
S: Split spoon SPT

Contract No: 5686	**Cable Percussion Borehole Log**			Borehole No: **BH03**
Contract:	City Quay	Easting:	716419.553	Date Started: 31/01/2020
Location:	City Quay, Dublin 2	Northing:	734407.078	Date Completed: 31/01/2020
Client:	City Arts and City Quay Partnership	Elevation:	3.01	Drilled By: J. O'Toole
Engineer:	-	Borehole Diameter:	200mm	Status: FINAL

Depth (m) Scale	Depth	Stratum Description	Legend	Level (mOD) Scale	Depth	Samples and Insitu Tests Depth	Type	Result	Water Strike	Backfill
	0.20	MADE GROUND: concrete.			2.81					
0.5		MADE GROUND: brown grey slightly sandy slightly gravelly silty clay with much red brick and concrete content.		2.5		0.50	ES	JOT19		
1.0				2.0		1.00	B	JOT20		
						1.20	C	N=13 (2,3/3,4,3,3)		
1.5	1.60	MADE GROUND: grey silty sandy gravel with much red brick and concrete content.		1.5	1.41					
2.0				1.0		2.00	B	JOT21		
						2.00	C	N=20 (1,2/4,7,5,4)		
2.5				0.5						
3.0	2.90	Medium dense silty very gravelly SAND with low cobble content.		0.0	0.11	3.00	B	JOT22		
						3.00	C	N=11 (1,2/2,3,3,3)		
3.5				-0.5						
4.0				-1.0		4.00	B	JOT23		
						4.00	C	N=16 (1,3/4,3,4,5)		
4.5				-1.5						
5.0				-2.0		5.00	B	JOT24		
						5.00	C	N=12 (2,2/2,2,4,4)		
5.5	5.50	Stiff grey slightly sandy slightly gravelly silty CLAY with low cobble content.		-2.5	-2.49					
6.0				-3.0		6.00	B	JOT25		
						6.00	C	N=16 (2,2/3,4,5,4)		
6.5				-3.5						
7.0	7.10	Very stiff black slightly sandy slightly gravelly silty CLAY with low cobble content.		-4.0	-4.09	7.00	B	JOT26		
						7.00	C	N=39 (6,7/39 for 90mm)		
7.5				-4.5						
8.0				-5.0		8.00	B	JOT27		
						8.00	C	50 (10,15/50 for 105mm)		
8.5	8.50	Grey slightly sandy slightly gravelly silty CLAY with high cobble content.		-5.5	-5.49					
9.0	9.00	Obstruction - possible boulders.		-6.0	-5.99	9.00	C	50 (25 for 10mm/50 for 5mm)		
	9.10	End of Borehole at 9.10m			-6.09					
9.5				-6.5						

Chiselling: From:	To:	Time:	Water Strikes: Strike:	Rose:	Depth Sealed	Water Details: Date:	Hole Depth:	Water Depth:	Installation: From:	To:	Pipe:	Backfill: From:	To:	Type:	Remarks:
1.80	1.90	00:45	4.80	4.10	NS	31/01	9.10	3.00				0.00	9.10	Arisings	Hand dug inspection pit to 1.20mbgl. Borehole terminated due to obstruction.
7.70	7.80	00:45	6.40	4.50	NS										
9.00	9.10	01:00													

Legend:
B: Bulk
D: Disturbed
U: Undisturbed
ES: Environmental
W: Water
C: Cone SPT
S: Split spoon SPT

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Site 1-6 City Quay			**Borehole Number** BH01
Machine : Berretta T44 **Flush** : Polymer **Core Dia:** 102 mm **Method** : Rotary Cored	**Casing Diameter** 146mm cased to 12.80m	**Ground Level (mOD)** 2.89	**Client** Ventaway Ltd
	Location 716425.8 E 734418.5 N	**Dates** 27/04/2022-03/05/2022	**Engineer** Byrne Looby Partners
			Job Number 11789-04-22
			Sheet 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
	-	-				2.84	0.05	Concrete			
							(1.15)	MADE GROUND: Brown/grey clayey gravelly Sand with frequent red brick and pieces of concrete			
1.20	73	-				1.69	1.20	MADE GROUND: Greyish brown sandy gravelly slightly silty Clay with silt lenses and red brick fragments			
							(0.60)				
2.30 2.30-2.75	67	-			3,2/4,4,4,4 SPT(C) N=16	1.09	1.80	MADE GROUND: Greyish dark brown sandy gravelly slightly silty Clay			
							(2.00)				
3.80 3.80-4.25	47	-			3,5/5,6,7,6 SPT(C) N=24	-0.91	3.80	Medium dense grey clayey sandy subrounded to rounded fine to coarse GRAVEL with sand and clay lenses			
							(2.75)				
5.30 5.30-5.75	37	-			2,3/4,4,3,4 SPT(C) N=15						
						-3.66	6.55	Firm brownish grey slightly sandy silty CLAY			
6.80 6.80-7.25	100	-			1,2/2,2,2,3 SPT(C) N=9						
							(3.25)				
8.30 8.30-8.75	97	-			2,2/1,2,3,3 SPT(C) N=9						
9.80 9.80-9.95					18,25/50 SPT(C) 50/0	-6.91	9.80	Medium strong to strong thinly laminated grey fine			

Remarks
Inspection pit dug to 1.20m BGL
No groundwater encountered
Slotted standpipe with flush cover installed for groundwater monitoring

Scale (approx)	Logged By
1:50	M.Sheehan

Figure No. 11789-04-22.BH01

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Site 1-6 City Quay			**Borehole Number** BH01
Machine : Berretta T44 **Flush :** Polymer **Core Dia:** 102 mm **Method :** Rotary Cored	**Casing Diameter** 146mm cased to 12.80m	**Ground Level (mOD)** 2.89	**Client** Ventaway Ltd
	Location 716425.8 E 734418.5 N	**Dates** 27/04/2022-03/05/2022	**Engineer** Byrne Looby Partners
			Job Number 11789-04-22
			Sheet 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
				NI				to medium grained LIMESTONE interbedded with weak to medium strong thinly laminated fine grained MUDSTONE. Partially weathered Non intact			
10.30	100	15		11			(1.10)	1 fracture set. F1: Dipping 10-30 degrees very close spacing stepped rough with clay infill			
10.70				NI		-8.01	10.90	Non intact			
11.00				6				Strong thinly laminated grey fine to medium grained LIMESTONE interbedded with weak to medium strong thinly laminated fine grained MUDSTONE. Distinctly weathered 1 fracture set. F1: Dipping 10-30 degrees very close to close spacing stepped smooth with clay smearing			
11.30											
11.70	100	73	34	NI			(1.90)	Non intact 1 fracture set. F1: Dipping 10-30 degrees very close to close spacing stepped smooth with clay smearing			
11.90				7							
12.80						-9.91	12.80	Complete at 12.80m			

Remarks

Scale (approx)	Logged By
1:50	M.Sheehan

Figure No. 11789-04-22.BH01

Ground Investigations Ireland Ltd
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Site 1-6 City Quay			**Borehole Number** BH02
Machine : Berretta T44 **Flush :** Polymer **Core Dia:** 102 mm **Method :** Rotary Cored	**Casing Diameter** 146mm cased to 11.30m	**Ground Level (mOD)** 3.10	**Client** Ventaway Ltd
	Location 716410.4 E 734386.8 N	**Dates** 26/04/2022-27/04/2022	**Engineer** Byrne Looby Partners
			Job Number 11789-04-22
			Sheet 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						2.95	(0.15) 0.15	Concrete			
							(1.05)	Grey/brown fine to coarse clayey gravelly Sand with occasional red brick and concrete			
1.20	59	-				1.90	1.20	MADE GROUND: Greyish dark brown sandy gravelly Clay with red brick and mortar fragments			
2.30							(1.10)				
2.30-2.75	100	-			1,1/2,1,2,2 SPT(C) N=7	0.80	2.30	MADE GROUND: Greyish dark brown slightly sandy gravelly slightly silty Clay with organic matter			
3.80							(1.50)				
3.80-4.25	0	-			5,6/8,7,8,7 SPT(C) N=30	-0.70	3.80	No recovery. Driller notes Sand (Dense)			
5.30							(1.50)				
5.30-5.75	50	-			3,4/4,5,7,6 SPT(C) N=22	-2.20	5.30	Stiff grey sandy gravelly CLAY. Driller notes Sand onto Clay			
6.80							(0.90)				
6.80-7.25	51	-			2,2/3,2,3,4 SPT(C) N=12	-3.10	6.20	Residual Soil: Stiff grey slightly sandy gravelly CLAY			
8.30							(2.40)				
8.30-8.75					6,7/9,8,10,13 SPT(C) N=40						
8.60	100	73	0	19		-5.50	8.60	Weak to medium strong thinly laminated grey fine to medium grained LIMESTONE interbedded withweak to medium strong thinly laminated fine grained MUDSTONE. Distinctly weathered 1 fracture set. F1: Dipping 20-40 degrees very close to close spacing stepped rough with clay infill			
9.60							(1.20)				
9.80						-6.70	9.80	Recovery consisting of strong thinly laminated			

Remarks
Inspection pit carried out to 1.20m BGL
No groundwater encountered
Slotted standpipe with flush cover installed for groundwater monitoring

Scale (approx)	Logged By
1:50	M.Sheehan

Figure No. 11789-04-22.BH02

Ground Investigations Ireland Ltd
www.gii.ie

Site 1-6 City Quay				**Borehole Number** BH02
Machine : Berretta T44 **Flush** : Polymer **Core Dia**: 102 mm **Method** : Rotary Cored	**Casing Diameter** 146mm cased to 11.30m	**Ground Level (mOD)** 3.10	**Client** Ventaway Ltd	**Job Number** 11789-04-22
	Location 716410.4 E 734386.8 N	**Dates** 26/04/2022-27/04/2022	**Engineer** Byrne Looby Partners	**Sheet** 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
				14				grey fine to medium grained LIMESTONE interbedded with weak to medium strong thinly laminated fine grained MUDSTONE.Partially weathered			
10.60	100	51	11	12			(1.50)				
11.20				NI		-8.20	11.30	Non intact			
11.30								Complete at 11.30m			

Remarks

Scale (approx)	Logged By
1:50	M.Sheehan

Figure No. 11789-04-22.BH02

Ground Investigations Ireland Ltd
www.gii.ie

Site 1-6 City Quay			**Borehole Number** BH03
Machine : Berretta T44 **Flush :** Polymer **Core Dia:** 103 mm **Method :** Rotary Cored	**Casing Diameter** 146mm cased to 11.30m	**Ground Level (mOD)** 3.15	**Client** Ventaway Ltd
	Location 716413.3 E 734361.3 N	**Dates** 25/04/2022-26/04/2022	**Engineer** Byrne Looby Partners
			Job Number 11789-04-22
			Sheet 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						3.05	0.10 (0.20)	Concrete			
						2.85	0.30 (0.50)	Grey fine to coarse angualr to subangular crushed rock FILL			
						2.35	0.80	MADE GROUND: Brown/grey clayey gravelly SAND with frequent red brick and concrete			
1.20	59	-					(1.70)	MADE GROUND: Greyish brown sandy gravelly Clay with red brick fragments			
2.30 2.30-2.75	98	-			1,12/2,1,2,23 SPT(C) N=28	0.65	2.50 (1.00)	MADE GROUND: Brownish dark grey slightly sandy slightly gravelly slightly silty slightly peaty Clay with organic matter and red brick fragments			
3.80 3.80-4.25	33	-			3,4/4,4,5,4 SPT(C) N=17	-0.35	3.50 (1.80)	POSSIBLE MADE GROUND: Greyish brown sandy gravelly Clay. Driller notes Sand. Driller notes Sand onto gravelly Clay			
5.30 5.30-5.75	70	-			2,2/4,4,5,4 SPT(C) N=17	-2.15	5.30 (0.70)	Medium dense grey slightly clayey slightly sandy subrounded to rounded fine to coarse GRAVEL			
						-2.85	6.00 (0.80)	Stiff grey slightly gravelly silty CLAY with shell fragments			
6.80 6.80-7.25	97	-			4,4/5,7,7,6 SPT(C) N=25	-3.65	6.80 (0.90)	Medium dense grey subrounded to rounded fine to coarse GRAVEL			
						-4.55	7.70 (0.60)	Stiff grey sandy gravelly CLAY			
8.30 8.30-8.45	97	33	0	NI	25,25/50 SPT(C) 50/0	-5.15	8.30 (1.00)	Recovery consisting of weak to medium strong thinly laminated grey fine to coarse grained LIMESTONE interbedded with MUDSTONE. Distinct weathering Non intact			
9.30				15		-6.15	9.30	Recovery consisting of medium strong to strong thinly laminated grey fine to medium grained LIMESTONE interbedded with MUDSTONE. Partial weathering 2 fracture sets. F1: Dipping 10-30 degrees			
9.80											

Remarks
Inspection pit carried out to 1.20m BGL
No groundwater encountered
Slotted standpipe with flush cover installed for groundwater monitoring

Scale (approx)	Logged By
1:50	M.Sheehan

Figure No. 11789-04-22.BH03

Ground Investigations Ireland Ltd
www.gii.ie

Site 1-6 City Quay			**Borehole Number** BH03
Machine : Berretta T44 **Flush** : Polymer **Core Dia**: 103 mm **Method** : Rotary Cored	**Casing Diameter** 146mm cased to 11.30m **Location** 716413.3 E 734361.3 N	**Ground Level (mOD)** 3.15 **Dates** 25/04/2022-26/04/2022	**Client** Ventaway Ltd **Engineer** Byrne Looby Partners	**Job Number** 11789-04-22 **Sheet** 2/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.30	97		23	18			(2.00)	close spacing stepped rough with clay smearing. F2: Dipping 60-80 degrees medium to wide spacing stepped rough with clay smearing			
11.30						-8.15	11.30	Complete at 11.30m			

Remarks

Scale (approx)	Logged By
1:50	M.Sheehan

Figure No. 11789-04-22.BH03

6.0 WATER AND HYDROLOGY (INCLUDING WATER FRAMEWORK DIRECTIVE ASSESSMENT)

6.1 INTRODUCTION

This chapter of the EIAR provides an evaluation of the current environmental conditions and the potential impacts of the proposed development on the hydrology of the site and its surrounding area. The effects on land, soils, geology, and hydrogeology are discussed in Chapter 5 (Lands, Soils, Geology, and Hydrogeology). Additionally, this chapter assesses the existing hydrological conditions and the likely impacts of the proposed development on the local hydrology.

This chapter has been prepared by Niall Barrett B.Eng, CEng, M.I.E.I, Cert Health and Safety, Cert PSDP, Cert RSA, Director of Cronin & Sutton Consulting Engineers (CS Consulting). Niall is a Chartered Civil and Transport Engineer and a 2005 graduate of Napier University, Edinburgh. He has extensive engineering consultancy experience in design, planning, and construction across a broad range of infrastructure, commercial, residential, and institutional development projects.

6.2 STUDY METHODOLOGY

This assessment was conducted based on the available baseline data, potential effects, and other available relevant information. The evaluation followed the methodology outlined in the relevant guidance documents listed below:

- Guidelines on the information to be contained in Environmental Impact Assessment Reports.

The following sources of information were consulted:

- Eastern River Basin District (ERBD) Management Plan - Liffey Water Management Unit and Programme of Measures – ERBD.
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW)).
- Requirement for the Protection of Fisheries Habitat During Construction and Development Works at River Sites (Eastern Regional Fisheries Board (ERFB)).
- Dublin City Council (2005) Greater Dublin Strategic Drainage Study: Technical Documents of Regional Drainage Policies. Dublin: Dublin City Council.
- Greater Dublin Regional Code of Practice for Drainage Works: Version 6.0 (Wicklow County Council, South Dublin County Council (SDCC), Meath County Council, Kildare County Council, Fingal County Council, Dun Laoghaire- Rathdown County Council & Dublin City Council).
- Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (CIRIA 532, 2001).

The quality, magnitude and duration of potential effects are defined in accordance with the criteria provided in the EPA Guidelines (Section 3, Table 3.4).

This EIAR Chapter is informed by the Site-Specific Flood Risk Assessment (CS Consulting Engineers, 2024) and Engineering Services Report (CS Consulting Engineers, 2024) as well as Chapter 2 of this EIA Report.

6.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

6.3.1 Topography

The topography of the proposed development site is generally flat with the elevation of the site ranging from 2.97mOD (Ordnance Datum) to 3.01 mOD.

6.3.2 Site Area Description

The site primarily consists of the former City Arts Centre Building and the surrounding hard standing area, bordered by City Quay to the north, Moss Street to the west, and Gloucester Street South to the south. To the east, the site is adjacent to the City Quay Covid testing centre and City Quay National School.

The former City Quay Arts site is one of Dublin City's most notable brownfield locations, offering an exceptional opportunity for high-density development in the heart of the city. Situated at the junction of City Quay and Moss Street, the site spans 0.22 hectares and is bordered by Gloucester Street South to the south. The entire site is covered in hard standing. For many years, the site has been vacant, with the abandoned City Arts Centre building occupying the northwest corner. Since the mid-1990s, the site has primarily been used for surface car parking, with a small storage shed located along the western boundary.

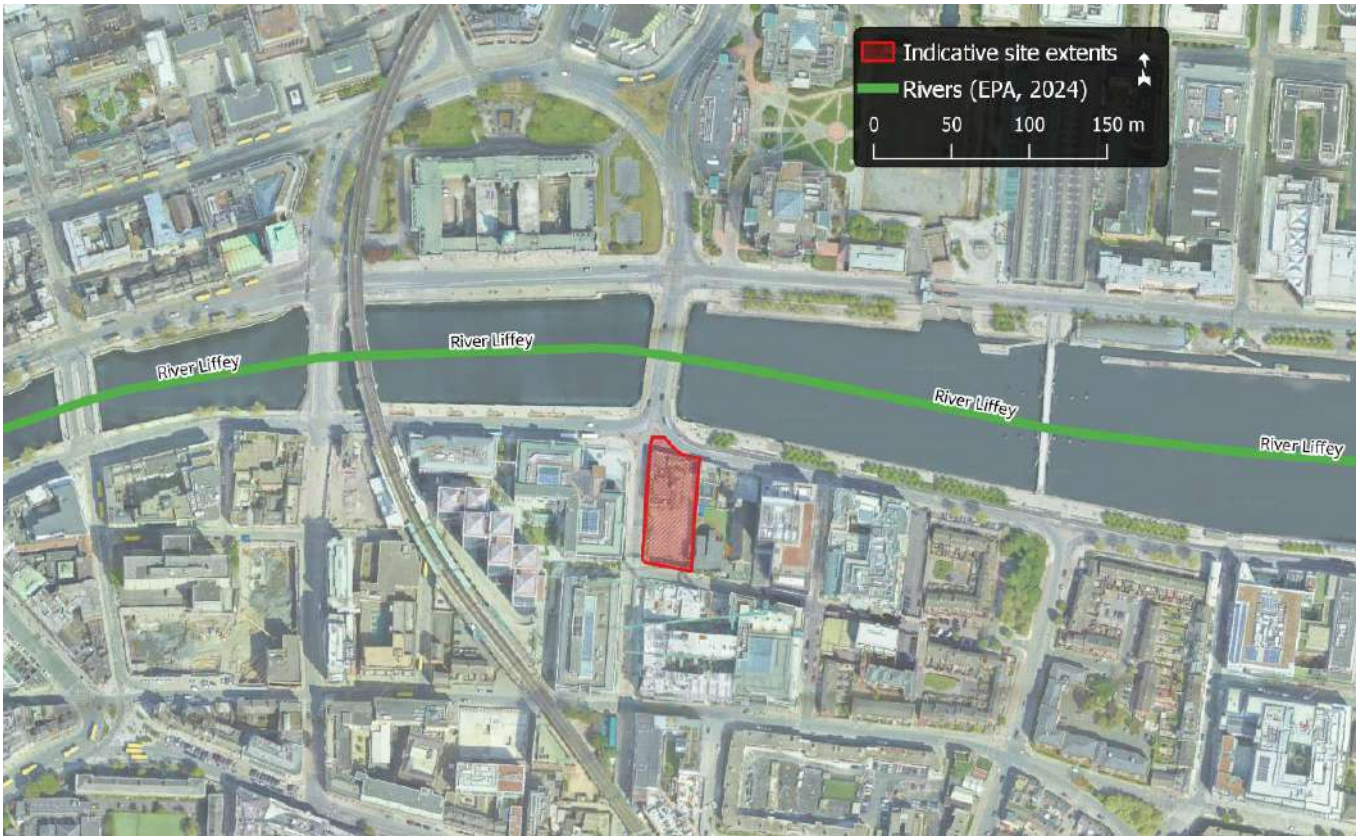
The site is strategically positioned to contribute to a growing cluster of developments around the Customs House. It has the potential to be integrated into the South Quays' architectural massing, alongside the recently approved Tara Street Tower and College Square developments, enhancing the symmetrical setting of the Customs House along the North Quays. The proposed development site is designated as 'Zone 25: City Centre' in the Dublin City Council Development Plan 2022-2028. The hydrological context of the surrounding environment is detailed in the following sections.

6.3.3 Hydrology

The proposed development is situated within Hydrometric Area No. 09, which covers the Liffey and Dublin Bay area of the Irish River Network. Specifically, the site lies within the Dodder Sub-Catchment (Dodder_SC_010), part of the larger River Liffey catchment. The River Liffey originates between Kippure and Tonduff in the Wicklow Mountains, flowing approximately 129 km through Counties Wicklow, Kildare, and Dublin before emptying into the Irish Sea at Dublin Bay. The River Liffey catchment spans an area of about 1,369 km².

The closest waterbody to the site is the River Liffey (IE_EA_090_0400, 09_2111), located roughly 0.02 km to the north of the proposed development. The river then discharges into Dublin Bay Natura Site, approximately 1.54 km east of the development site. There is a possibility that a section of the now-disused 'Gallows Stream' could cross the proposed development area. Historical records suggest that the stream originated near Leeson Lane off Leeson Street and flowed near Government Buildings (Oram, 2004; Sweeney, 2017). However, site investigations did not detect the stream's presence. The River Liffey and Liffey Estuary Upper are classified as 'Moderate' and 'Good' in terms of water quality, respectively.

Figure 6.1. Hydrological Environment (approximate boundaries denoted with red below)



6.3.4 Water Quality

The proposed development is situated within Hydrometric Area No. 09, which covers the Liffey and Dublin Bay area of the Irish River Network. Specifically, the site lies within the Dodder Sub-Catchment (Dodder_SC_010), part of the larger River Liffey catchment as shown in **Error! Reference source not found.** above.

The development is situated within the Eastern River Basin District (ERBD), as defined by the EU Water Framework Directive (2000/60/EC), which establishes a framework for community action in the field of water policy, commonly referred to as the Water Framework Directive (WFD).

The Liffey Estuary Upper is classified as 'Moderate' due to its designation as 'Potentially Eutrophic'. However, the water quality improves downstream, beyond the Talbot Memorial Bridge, where it is classified as 'Intermediate.' These waterbodies are considered transitional.

Surface Water Quality

Q Values are used by the Environmental Protection Agency (EPA) to indicate the biological water quality of a water body, based on changes in the macroinvertebrate communities in riffle areas due to organic pollution. A Q1 value represents a seriously polluted water body, while a Q5 value indicates unpolluted water of high quality.

The River Liffey is classified as 'Poor' at the nearest river station to the site, located at LIFFEY - 0.2 km downstream of Chapelizod Bridge (Lynch's Lane) (RS09L012360), approximately 6.05 km upstream (west). This is an operational station, and its current status is 'Poor' with a Q-value of 3, as recorded in 2022. The descriptions of each of the Q Ratings are shown in **Error! Reference source not found.**.

Table 6.1. EPA Biological Q Ratings

Quality Class	Quality Ratings	Condition	Pollution Status
Class A	Q5, Q4-5, Q4	Satisfactory	Unpolluted
Class B	Q3-4	Unsatisfactory	Slightly Polluted
Class C	Q3, Q2-3	Unsatisfactory	Moderately Polluted
Class D	Q2, Q1-2, Q1	Unsatisfactory	Seriously Polluted

6.3.5 Water Supply

CS Consulting Engineers have prepared an Engineering Services Report (ESR), which has been submitted as part of the planning application documentation. Along with the planning drawings, the report outlines the existing and proposed water supply, drainage, and wastewater plans for the site.

A pre-connection inquiry has been submitted to Uisce Éireann (UE), and it is anticipated that a connection agreement will be established to provide potable water to the proposed development. Records from Uisce Éireann indicate that two connections (250mm Ductile Iron pipes) currently serve the site, linking it to the IW network at Moss Street. Additionally, the existing Water Supply Network records show another 250mm DI watermain on City Quay and a 5" Cast Iron water main along Gloucester Street.

6.3.6 Foul Infrastructure

According to the available Uisce Éireann maps, the existing wastewater network in the streets surrounding the proposed development site is a combined system, handling both stormwater and foul water discharges.

6.3.7 Surface Water Drainage

As mentioned earlier, based on the available Uisce Éireann maps, the existing wastewater network in the streets surrounding the proposed site is a combined system, carrying both stormwater and foul water discharges.

Additionally, aerial images and survey data indicate that the current surface water drainage flows freely into the combined public sewer system without any restrictions.

6.3.8 Flooding

The existing road levels around the site range from 2.950m to 3.150m OD on Moss Street. To aid in flood protection, the entrances to the ground floor of the proposed building will be approximately 0.8m higher than the surrounding ground level. The development will include a double-level basement, with the lowest finished floor level set at approximately -4.0m OD, which is 8.0m below the highest ground floor level. The main vehicular access to the site will be via Gloucester Street, with a car lift providing access to the basement parking (details are provided in the architects' plans).

A Flood Risk Assessment (FRA) has been conducted by CS Consulting Engineers and is included in Appendix 6.1. A summary of the flood risk for the site is provided below.

The Flood Risk Assessment for the City Quay development site has been carried out in relation to the proposed multi-storey commercial development.

The eastern portion of the subject site is located within Flood Zone A and B, and the remainder within Flood Zone C.

The development of a commercial complex is classified as a less vulnerable development under the Flood Risk Management Guidelines.

The proposed development follows a precautionary approach to setting finished floor levels, as outlined in Section 5.16 of the Flood Risk Management (FRM) Guidelines. It is designed to be resilient to breach, overtopping, and climate change scenarios. The commercial development will be situated above the 0.5% Annual Exceedance Probability (AEP) coastal flood level, with allowances for climate change and freeboard, set at 3.92mOD.

The development will not alter flood extent, depth, risk, or flood routes in surrounding areas.

Although the development will rely on the existing South Campshire Flood Protection Scheme for additional protection, it incorporates its own measures to meet the required design standards outlined in the FRM Guidelines.

A justification test has been conducted for the proposed development, confirming its appropriateness and demonstrating that it aligns with the requirements of *The Planning System and Flood Risk Management, Guidelines for Planning Authorities* (2009), as well as local zoning objectives, while respecting the local streetscape and urban fabric.

6.3.9 Rating of Site Importance of the Hydrology Features

Based on the TII methodology, the hydrological features at this site are rated as Medium Importance for the following reasons:

- The site has no direct connectivity to a major receiving waterbody.
- There are no surface water sources in the surrounding area that are designated for potable water, amenity, or fisheries purposes.
- The status of the receiving water is classified as Moderate.

6.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed building consists of 14 floors above the ground floor and includes 2 basement levels. The lower basement level accommodates 11 car parking spaces, including 2 disabled accessible spaces and 3 motorbike spaces.

Further details of the Proposed Development can be found in Chapter 2 (Description of the Proposed Development). The key characteristics of the proposed development in relation to the hydrological environment are outlined below.

6.4.1 Water Supply

The water supply for the site has been designed in accordance with Irish Water Code of Practice and standard construction details. A pre-connection enquiry form has been issued to Uisce Éireann.

It is expected that the existing surrounding watermain network will provide sufficient water supply to meet the needs of the proposed development, including fire flow requirements. This will be confirmed after Irish Water completes its assessment.

Water conservation measures will be implemented throughout the development, addressing both potable and non-potable water demands.

The estimated post-development water demand for the proposed development is 6.586 l/sec, as outlined in the Engineering Services Report submitted with this planning application.

6.4.2 Foul Sewage

The foul drainage system has been designed in compliance with industry standards, the Building Regulations, and the guidelines outlined in Technical Guidance Document H. It will be installed in full accordance with Uisce Éireann's requirements for taking the system in charge.

Uisce Éireann's maps indicate that the existing wastewater network in the surrounding streets of the proposed development site is a combined system, handling both stormwater and foul discharge.

Based on the Engineering Services Report submitted with this planning application, the foul discharge from the proposed development is calculated to be 4.742 l/s (with a peak flow of 4.5 times the Dry Weather Flow).

6.4.3 Surface Water Drainage

6.4.3.1 Construction

The main civil engineering activities during the construction of the proposed development that could potentially affect the water and hydrological environment are summarised as follows:

- Excavations required for the foundations of the proposed buildings and the installation of associated services.
- Excavations for the two basement levels.
- Potential discharge of collected rainwater during excavation and groundworks, depending on the season during which the development occurs.
- Storage of cement, concrete materials, temporary oils, and fuels on-site, which may result in small, localised accidental releases of contaminants, such as hydrocarbons, from construction traffic and vehicles operating on-site.
- Localised excavation (cuts) and infill (build-up) to achieve the designed elevation changes across the proposed development site.

6.4.3.2 Operation

The proposed surface water drainage design has been developed in accordance with The Greater Dublin Regional Code of Practice for Drainage Works, The Greater Dublin Strategic Drainage Study (GDSDS), Volume 2, British Standard BS EN 752:2008 (Drains and Sewer Systems Outside Buildings), and Part H of the Building Regulations (Building Drainage).

Surface water runoff from the proposed development will be attenuated on-site before being discharged into the combined public sewers located on Moss Street. Although the site is brownfield, the development will reduce stormwater discharge to a maximum of 2l/s, as specified in the Greater Dublin Regional Code of Practice for Drainage Works. A flow control device will be used to limit discharge into the existing public combined sewer.

In line with the Dublin City Development Plan 2022-2028, Objective SIO3 requires all new developments to provide separate foul and surface water drainage systems and to incorporate sustainable urban drainage systems (SuDS). The proposed design integrates SuDS and features such as Green Blue Roofs, as outlined in Appendix 11 of the DCC Development Plan 2022-2028, and considers the control of paving and grassed areas. Surface water from the development will be managed on-site, attenuated, and then discharged to the existing Irish Water combined sewer at a controlled maximum flow rate of 2l/s.

The SuDS Systems for the proposed development at 1-6 City Quay includes the following:

- Green/ Blue Roofs - It is proposed to provide Green Blue roof at the setback on level 11 and at main roof level, which shall retain and attenuate rainfall at source prior to out falling to the public network. It is proposed to provide blue roof below the landscaping at the terraces on levels 6, 9 and 12 as well as below the area of PV panels at Roof level. The Green /Blue roof shall have a total storage volume of 113 m^3.

- Green Roofs - It is proposed to provide 576m^2 of biodiverse green roof at level 11 and roof level. In addition to this it is also proposed to provide soft landscaping area on terrace.

- Attenuation - Based on the adopted run off rate the total attenuation storage volume required is 121m^3, with 18m^3 provided in the attenuation storage system located at the basement level and 103m^3 provided within the combined blue roof buildup at terrace and roof levels noted above. The attenuation tank is designed to attenuate a 1:100 year+ 20% climate change storm event.

Refer to Engineering Services Report and Engineering Drawings prepared by CS Consulting submitted with this planning application for further details on the surface water management plan and drainage details.

6.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

The potential impacts on the surface water environment during both the construction and operational phases of the proposed development are outlined in the following sub-sections below:

6.5.1 Construction Phase

The main civil engineering works for the proposed development will involve excavating material for the foundations and the delivery of imported materials such as engineering fill, crushed stone, concrete, reinforcement, and other construction supplies. Additionally, construction activities will include on-site storage of cement, concrete materials, oils, and fuels.

Increased Run-off and Sediment Loading

Surface water runoff during the construction phase, resulting from site preparation, levelling, landscaping, and excavations, may contain elevated silt levels or become contaminated by construction activities. Runoff with high silt content can damage surface water systems and receiving watercourses. Silt-laden water may arise from excavations, exposed ground, stockpiles, and access roads.

During construction, there is potential for increased runoff due to the introduction of impermeable surfaces and soil compaction. This will reduce the infiltration capacity of the site and increase the volume and rate of surface runoff. The resulting impact could include an increase in surface water runoff and sediment loading, which might affect local drainage systems. Site testing and previous use of the land have shown elevated levels of metals such as lead and zinc, as well as trace amounts of asbestos. Further environmental testing will be conducted before subsoil disposal, and hazardous materials will be removed at the outset of the project. There is no risk to the surrounding hydrological environment as these materials will be safely disposed of at a licensed facility by a licensed contractor.

A potential direct pathway exists from the excavation area to the surface water drainage system through overland flow. Mitigation measures, as outlined in Section 6.7, will be implemented to prevent any risk to the site's drainage system.

Uncontrolled Discharges, Fuel and Other Accidental Spills

During the construction phase, there is a potential risk of accidental pollution incidents from the following sources:

- Spillage or leakage of fuels and oils stored on-site.
- Spillage or leakage of fuels and oils from construction machinery or site vehicles.
- Spillage of oil or fuel during the refuelling of machinery on-site.
- The use of concrete and cement materials.

Machinery activities on-site during the construction phase may result in the contamination of runoff into surface water. Potential impacts could arise from accidental spills of fuels, oils, paints, and similar substances, which may affect surface water if allowed to flow into drainage systems and/or receiving watercourses. Concreting operations near surface water drainage points during construction also pose a risk of discharges into watercourses. Concrete, particularly its cement component, is highly alkaline, and any spillage into a local watercourse could harm water quality, as well as local fauna and flora. The mitigation measures outlined in Section 6.7 will be implemented to minimise and address any potential impacts.

Wastewater

Welfare facilities for contractors will be provided on-site during the construction works. Portable sanitary facilities will be made available, with waste collected and disposed of in an appropriate manner. No adverse impacts on wastewater are anticipated during the construction phase.

Summary of Construction Phase Impacts

A summary of the construction phase impacts for the proposed development, both with and without mitigation, in accordance with EPA (2022) EIA guidelines, is presented in the following sections.

Without the implementation of mitigation measures (design), the magnitude of the impact during the construction phase is expected to be short-term in duration, with a moderate adverse impact rating on the hydrological environment in the immediate vicinity of the development site.

However, with the adoption of design and mitigation measures (outlined in Section 6.7), the impact during the construction phase is expected to remain short-term in duration, with an imperceptible impact rating.

6.5.2 Operational Phase

The impact of the proposed development during its operational phase is summarised below:

Surface Water Runoff

Without proper control measures, an increase in hardstanding areas would lead to a higher rate of surface water runoff. Dublin City Council (DCC) mandates all new developments to incorporate Sustainable Drainage Systems (SuDS) to manage surface water on-site. This requirement is in line with the Greater Dublin Strategic Drainage Strategy, and the proposed development incorporates SuDS in its drainage design to manage surface water effectively.

Uncontrolled Discharges, Fuel and Other Accidental Spills

There is a potential for localised leaks and spillages from vehicles along access roads and parking areas. Any accidental release of oil, petrol, or diesel could lead to contamination if not properly mitigated and if it enters the water environment.

While there is no direct pathway to surface water from this site, there is an indirect pathway through the drainage system. The mitigation measures outlined in Section 6.7 will prevent potential impacts on both on-site and off-site watercourses.

Foul Water

As previously mentioned, the proposed development will result in an increase in foul water discharge.

Water Supply

The proposed development will lead to an increased demand for water from the Dublin City Council water supply system, as outlined in previous sections.

Summary of the Operational Phase Impacts

A summary of the operational phase impacts for the proposed development, with and without mitigation, following EPA (2022) EIA guidelines is provided below.

Without mitigation and design measures, the magnitude of the impact during the operational phase is temporary in duration, with a not significant impact rating on the hydrological environment in the immediate vicinity of the proposed development site.

However, with the implementation of design and mitigation measures (as described in Section 6.7), the impact during the operational phase will be long-term in duration, with an imperceptible impact rating.

6.6 DO NOTHING SCENARIO

If the proposed development does not proceed, runoff from the site will continue to directly flow into the existing drainage system.

It is important to note that the proposed redevelopment is expected to have a positive impact on the receiving waters. The drainage design for the site will comply with the Greater Dublin Strategic Drainage Study (GDSDS) Guidelines, which will result in attenuated runoff from the site and enhanced water quality management.

6.7 REMEDIAL AND MITIGATION MEASURES

The proposed development design has carefully considered the potential impacts and risks to the water environment. To minimise or avoid negative effects, mitigation measures have been developed, focusing on best practice construction techniques and compliance with relevant regulations.

The following mitigation measures aim to address impacts during both the construction and operational phases of the project. Due to the interconnected nature of Chapter 6 (Hydrology) and Chapter 5 (Land, Soils, Geology, and Hydrogeology), the mitigation measures discussed will be applicable to both sections.

6.7.1 Construction Phase

A project-specific Outline Construction and Environmental Management Plan (CEMP) has been developed by CS Consulting and is included as part of this planning application. Before construction begins, the CEMP will be updated and managed by the contractors throughout both the construction and operational phases. The CEMP will address all potentially polluting activities and include an emergency response procedure. All site personnel will receive training on how to implement these procedures effectively.

Soil Handling, Removal, and Compaction

Soil sampling (three samples) conducted on-site revealed that the soil is hazardous due to elevated levels of lead and zinc. Additional soil sampling and testing will be required if any soil needs to be removed from the site. Any soil removed will be disposed of by a licensed contractor at a licensed facility.

Temporary storage of soil will be carefully managed to prevent any adverse impact on the surrounding environment, with materials being stored away from surface water drains. The movement of materials will be minimised to reduce soil degradation and dust generation.

Basement Assessment – Mitigation Measures

The design includes the following mitigation measures to protect water quality during the construction and operation of the basement:

1. Groundwater and Rainwater Management During Excavation:

- Any minor ingress of groundwater and collected rainfall during excavation will be pumped out.
- The water will be discharged via the existing stormwater sewer network, with the use of silt traps and an oil interceptor, if necessary. This ensures that no silt or contaminated water is discharged into the sewer.

2. Site Investigation and Water Bearing Gravels:

- Site investigation has not identified significant water-bearing gravels within the basement footprint. If such gravels are encountered, the design will facilitate water discharge around the basement structure to prevent flooding.

3. Spill Control and Material Storage:

- All oils, solvents, and paints used during construction will be stored within temporary bunded areas. These bunds will have a volume capacity of 110% of the largest tank/container to prevent spillage into the surrounding environment.

4. Concrete Management:

- Ready-mixed concrete will be delivered to the site by truck, and a risk assessment will be carried out for wet concreting operations to ensure no discharge of alkaline wastewater or contaminated stormwater to the underlying subsoil.

- Concrete washing and washout of concrete vehicles will take place off-site at an appropriate facility.

5. Outline Construction and Environmental Management Plan (OCEMP):

- An OCEMP, prepared by CS Consulting Engineers, will guide the management of water and other environmental impacts during construction. A detailed CEMP will be produced by the appointed contractor before the start of construction and will include management of any collected water.

6. Ground Movement and Monitoring:

- Ground movements will be closely monitored, particularly in areas where movements are critical. Instruments such as inclinometers will be installed in the basement wall to monitor ground behaviour and ensure predicted values align with actual movements.

- Monitoring will include weekly readings of surveying points set up before the start of works. Vibration monitors will be installed to protect adjacent structures, and contingency measures will be put in place if movements exceed predetermined levels.

7. Water Inflow Risk:

- Based on groundwater monitoring of the adjacent site, it is considered that the risk of inflow during construction is low. Installation of piles prior to excavation is expected to mitigate groundwater inflow risks.

8. Impact on Water Levels and Aquifers:

- The basement excavation is not expected to affect the water levels in the overburden or the underlying aquifer. The bedrock water table will not be impacted by the excavation works.

- Temporary dewatering of the perched water table during excavation will have a minor, local impact, and no long-term effect is anticipated.

9. Waterproofing of Basement:

- The basement will be fully waterproofed to prevent groundwater ingress into the finished structure.

10. Management of Collected Rainwater and Groundwater:

- Any collected rainwater and groundwater seepage during the basement excavation will be pumped to the existing sewers after appropriate treatment, with approval from the regulatory authority.

These measures ensure that the basement construction will not adversely impact the surrounding water environment, and all potential risks are mitigated through careful planning, monitoring, and adherence to best practices.

<u>Fuel and Chemical Handling Mitigation Measures</u>

To minimise the impact on the underlying subsurface strata and surrounding environment from material spillages, the following mitigation measures will be employed during the construction phase of the development:

1. Storage of Oils, Solvents, and Paints:

- Oils, solvents, paints, and other chemicals will be stored in **temporary bunded areas**.
- Oil and fuel storage tanks will be placed in **designated bunded areas**, with the bunds designed to contain 110% of the volume of the largest tank/container plus an allowance of 30 mm for rainwater ingress.
- Drainage from the bunded areas will be diverted for **safe collection and disposal**, ensuring that no spillage contaminates surrounding soil or water systems.

2. Refuelling and Maintenance of Vehicles:

- **Refuelling of construction vehicles and equipment** will take place in a **designated refuelling area** on-site (or, where possible, off-site) located away from surface water drains or gullies.
- In the event that a machine needs to be refuelled outside of the designated area, fuel will be transported using **mobile double-skinned fuel tanks** to minimise the risk of leakage or spillage.
- An adequate supply of **spill kits** and **hydrocarbon adsorbent packs** will be maintained in the designated refuelling area. All personnel involved in refuelling operations will be **fully trained** in the use of these equipment and emergency procedures.
- The project will adhere to guidelines such as **"Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001)** to ensure best practices are followed.

3. Concrete Management:

- **Ready-mixed concrete** will be delivered to the site by truck, and a **suitable risk assessment** for wet concreting will be completed prior to commencement. The risk assessment will include measures to prevent the discharge of **alkaline wastewater** or **contaminated stormwater** into the underlying subsoil.
- The concrete pouring will occur within a **designated area** on-site, and a **geosynthetic material** will be used to prevent **concrete runoff** into the soil or groundwater.
- Wash down and washout of concrete trucks will take place **off-site** at an appropriate facility, reducing the risk of contamination from concrete residues.

4. Chemical Storage and Handling:

- **Drummed fuels** or other chemicals used during construction will be stored in a **dedicated, internally bunded chemical storage cabinet**. These cabinets will be clearly **labelled** to facilitate appropriate remedial action in case of a spill.
- The storage area will be managed to ensure that any potential spills can be contained and dealt with promptly, following best practices for hazardous material management.

By adhering to these robust mitigation measures, the project aims to prevent contamination of soil, groundwater, and surface water during the construction phase, ensuring compliance with environmental regulations and minimising any potential negative impacts.

6.7.2 Operational Phase

During the operational phase of the development, there will be no need for bulk fuel storage, reducing the risk of fuel spills. There will also be no discharge of water to the ground, as surface water will be managed through the drainage system. Additionally, the development will not extract groundwater, ensuring no impact on local water supplies. An Environmental Management Plan (EMP) will be implemented during operation to oversee environmental protection. The plan will include measures to prevent environmental harm and emergency response procedures in case of incidents, ensuring quick and effective action if needed.

Surface Water Drainage

The proposed development will significantly enhance the local drainage system by providing full attenuation for the increased hardstanding area, in line with the requirements of the Greater Dublin Strategic Drainage Study. Several measures will be implemented to reduce the risk of spills affecting the water environment, including the design of the car park and on-site speed restrictions.

A flood risk assessment was carried out in accordance with the OPW's "The Planning System and Flood Risk Management Guidelines for Planning Authorities" (November 2009). For further details, please refer to Section 6.3.7,

Flooding, above. The full Flood Risk Assessment for the proposed development can be found in Appendix 6.1 at the end of this report.

Foul Water

The proposed development will operate within the requirements of the connection agreement with Uisce Éireann.

Water Supply

Flow monitoring will be installed at the point where the public and private water mains meet, serving the purposes of billing and leakage detection. The specific details of the required meter and its enclosure will be discussed and agreed upon with the water authority prior to the start of construction.

6.8 RESIDUAL IMPACT OF THE PROPOSED DEVELOPMENT

6.8.1 Construction Phase

During construction, after applying the mitigation measures outlined in Section 6.6.1, the impact on water quality is expected to be short-term and imperceptible, with a neutral effect on water quality. This means any measurable impacts will have no significant consequences. This conclusion is based on assessments showing that there will be no significant increase in runoff from the site, and the quality of any runoff will be effectively mitigated if necessary.

6.8.2 Operational Phase

The operational phase of the proposed development has been carefully assessed for its potential effects on the hydrological environment. It is concluded that the development will not negatively impact any surface water bodies during operation, nor will it increase flood risk. With the implementation of mitigation measures as outlined in Section 6.6.2, no adverse effects are anticipated. Therefore, the operational phase is expected to have a long-term, imperceptible effect with a neutral impact on water quality, meaning any measurable changes will not have significant consequences.

6.9 MONITORING OR REINSTATEMENT

6.9.1 Construction Phase

During the construction phase, the site drainage systems will be monitored to ensure that construction activities do not negatively impact surface water. This monitoring will help confirm that all implemented mitigation measures are effective in protecting the hydrological environment.

6.9.2 Operational Phase

Maintenance of the stormwater and foul sewer systems for the entire landholding will adhere to the standards and requirements specified by the relevant utility providers. This ensures the systems function effectively and remain in compliance with all applicable regulations.

6.10 CUMULATIVE IMPACTS OF THE PROPOSED DEVELOPMENT

The cumulative impact of the proposed development, in conjunction with other related, permitted, concurrent, and future developments, has been carefully considered. A detailed discussion on these developments and their potential interactions with the proposed development is provided in Chapter 2 (Description of the Proposed Development). This analysis ensures that any combined effects on the environment, infrastructure, and local area are thoroughly evaluated and addressed.

6.10.1 Construction Phase

In relation to the potential cumulative impact on hydrology during the construction phases, the construction works that could have potential cumulative impacts include excavation activities, soil handling and removal, and the potential for increased surface water runoff from multiple construction sites. Additional factors include the use of machinery and temporary storage of construction materials such as fuels, oils, and concrete, which carry a risk of

accidental spills or contamination. These activities, if occurring concurrently with other nearby developments, could collectively increase the likelihood of impacts on local drainage systems and water quality.

Mitigation measures and careful coordination with other projects will minimise these risks and ensure no significant cumulative impact on hydrology, these include:

- Contractors for the proposed development will be required to adhere to the Construction and Environmental Management Plan (CEMP), which incorporates the mitigation measures outlined in this Environmental Impact Assessment (EIA) report. Similarly, other developments will also need to implement water protection measures to meet legislative standards for receiving water quality, as set out in the European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and S.I. 77 of 2019). As a result, the potential for cumulative changes to the natural hydrological regime is minimal. The cumulative impact is considered to be neutral and imperceptible.

- Surface water run-off during the construction phase has the potential to carry increased levels of silt or become polluted due to construction activities. Such run-off can damage surface water systems and receiving watercourses by reducing water quality, clogging drainage systems, and negatively affecting aquatic habitats.

- Accidental spillages or leakages from construction traffic and materials could potentially contaminate local water sources if not properly managed. However, the absence of notable surface water features on-site and the lack of direct hydrological pathways to off-site surface water bodies reduce the risk of significant contamination. Compliance with project-specific Construction Environmental Management Plans (CEMPs) will further mitigate this risk, ensuring proper handling, storage, and response measures are in place.

- There is a potential for contamination of watercourses during the construction phase, primarily due to sediment runoff and fuel leakages. However, mitigation measures will be implemented to manage these risks during both construction and operation. All developments must comply with relevant legislation, such as the European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009), which require effective management of runoff and fuel leakages to protect the receiving water environment. These measures will ensure that the development does not negatively impact water quality.

The residual cumulative impact on water and hydrology during the construction phase is expected to be short-term, with an imperceptible effect and a neutral impact on water quality. This is contingent on the implementation of appropriate mitigation measures to manage water quality runoff, ensuring compliance with legislative requirements for each development. These measures will effectively minimise any potential impact on the water environment during construction.

6.10.2 Operational Phase

Potential cumulative impacts in the operational phase include:

- The expansion of hard-standing areas will decrease the local groundwater recharge and, if not controlled to match the greenfield runoff rate, could increase surface water runoff;

- There is an increased risk of accidental fuel spills during storage or delivery, unless proper mitigation measures, such as bunded tanks, are in place;

- There is an increased risk of accidental hydrocarbon discharges from car parking areas and roads, unless these are diverted into the surface water system equipped with a petrol interceptor; and

- Any additional foul discharges should be properly treated, if necessary, and/or redirected to the foul sewer system instead of being discharged directly to the ground.

Mitigation measures similar to those outlined in Section 6.7 will need to be applied to safeguard water quality.

An increase in wastewater loading and water supply demand is a common impact for all developments. Each development will need approval from Uisce Éireann to confirm the availability of capacity in the water and wastewater infrastructure. The surface water and foul drainage systems, as well as the water supply infrastructure for the proposed development, have been designed to accommodate the anticipated future substation development.

The development will lead to an increase in hardstanding, which will reduce local groundwater recharge and increase the runoff rate. However, each approved development must comply with the Greater Dublin Strategic Drainage Strategy (GDSDS) and the requirements set by the Local Authority and Uisce Éireann. This includes implementing appropriate on-site attenuation measures to maintain greenfield runoff rates and ensure that there is no increase in off-site flooding due to the development.

The residual cumulative impact on water and hydrology during the operational phase is expected to be long-term with an imperceptible effect and a neutral impact on quality, provided that appropriate mitigation measures are implemented to manage water quality runoff in accordance with legislative requirements for each development.

6.11 DIFFICULTIES ENCOUNTERED IN COMPILING

No particular difficulties were encountered in the preparation of this EIAR chapter.

6.12 REFERENCES

- **Construction Industry Research and Information Association, 2011**. *Environmental good practice on site;* Construction Industry Research and Information Association publication C692 (3rd Edition - an update of C650 (2005); (I. Audus, P. Charles and S. Evans), 2011.

- **Construction Industry Research and Information Association, 2012**. *Environmental good practice on site -pocket book;* Construction Industry Research and Information Association publication C715 (P. Charles, and G. Wadams), 2012.

- **Environmental Protection Agency, 2003**. EPA *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements;* Environmental Protection Agency.

- **Environmental Protection Agency, 2022**. *Guidelines on the information to be contained in Environmental Impact Assessment Reports;* Environmental Protection Agency.

APPENDIX 6.1

SITE SPECIFIC FLOOD RISK ASSESSMENT

Document Title

Site Specific Flood Risk Assessment

Project

Proposed Office Development at 1-6 City Quay

Client

Ventaway Ltd

Job No. V101

19 November 2024

CS CONSULTING
Civil, Structural & Traffic Engineering

CS CONSULTING
Civil, Structural & Traffic Engineering

SITE SPECIFIC FLOOD RISK ASSESSMENT

PROPOSED OFFICE DEVELOPMENT AT 1-6 CITY QUAY

DOCUMENT STATUS					
File Location: V_JOBS\Job-V101\B_DOCUMENTS\1.0 Planning\SSFRA					
BS 1192	16CQ-CSC-ZZ-XX-RP-C-0001 Site Specific Flood Risk Assessment				
Version	Purpose of Document	Author	Reviewed by	Approved by	Issue Date
P1	PLANNING ISSUE	LJ	NB	MMcE	28.11.2024

CS CONSULTING
Civil, Structural & Traffic Engineering

SITE SPECIFIC FLOOD RISK ASSESSMENT

PROPOSED OFFICE DEVELOPMENT AT 1-6 CITY QUAY

CONTENTS

FIGURES

1.0 INTORDUCTION

Cronin & Sutton Consulting Engineers (CS Consulting) have been commissioned by Ventaway Ltd. to prepare a Site-Specific Flood Risk Assessment (SSFRA) for a proposed office development at 1-6 City Quay, Dublin 2.

In preparing this report, CS Consulting has made reference to the following:

- Dublin City Development Plan 2022–2028
  (including Strategic Flood Risk Assessment)
- Greater Dublin Strategic Drainage Study (GDSDS) 2005
- The Planning System and Flood Risk Management: Guidelines for Planning Authorities 2009 (Flood Risk Management Guidelines)
- Greater Dublin Regional Code of Practice for Drainage Works (Version 6)
- Irish Water Drainage and Supply Records
- Office of Public Works Flood Maps
- Geological Survey of Ireland Maps

The SSFRA is to be read in conjunction with the engineering drawings and documents submitted by CS Consulting and with all other relevant documentation submitted by other members of the project design team.

2.0 SITE LOCATION AND PROPOSED DEVELOPMENT

2.1 Site Location

The site of the proposed development is located on the South Quays of the River Liffey in Dublin city centre, approx. 450m to the east of O'Connell Bridge, with frontages onto City Quay, Moss Street, and Gloucester Street South. The development site has an area of approx. 0.22ha and is located in the administrative jurisdiction of Dublin City Council.

The development site encompasses the existing registered addresses of 1-4 City Quay (D02 KT32), 5 City Quay (D02 PC03) and 23-25 Moss Street (D02 F854)..

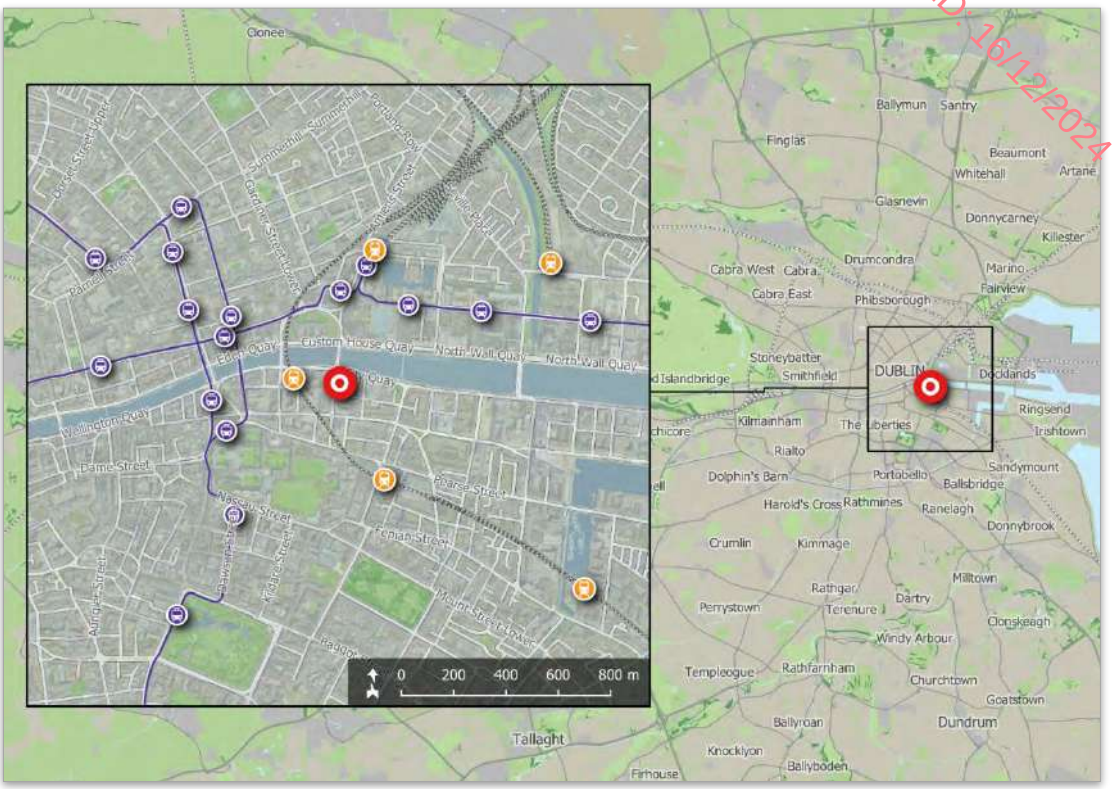


Figure 1 – Location of proposed development site
(Image source: EPA, OSi, OSM Contributors, Google)

The location of the proposed development site is shown in Figure 1 above; the extents and context of the development site are shown in more detail in Figure 2.

The development site is bounded to the north, west, and south by the aforementioned streets of City Quay, Moss Street, and Gloucester Street South. To the east, the site is bounded by HSE premises at 7/8 City Quay (D02 Y663) and by the grounds of the City Quay National School on Gloucester Street South (D02 H277).

Figure 2 – Site extents and environs
(map data and imagery: NTA, OSM Contributors, Google)

2.2 Existing Site Condition

The subject development site is brownfield. Several derelict structures are present in the northern part of the site; the remainder comprises hardstanding that is currently in use as a commercial car park, accessed from City Quay.

2.3 Description of Proposed Development

The proposed development comprises demolition of the existing buildings and structures and construction of a building up to 14 storeys in height over a double basement including arts and cultural spaces and ancillary uses; associated car and bicycle parking; all ancillary and associated works to facilitate the development. An Environmental Impact Assessment Report and Natura Impact Statement have been prepared in respect of the proposed development and have been submitted with the planning application.

3.0 LEVEL OF SERVICE AND FLOOD RISK ZONING

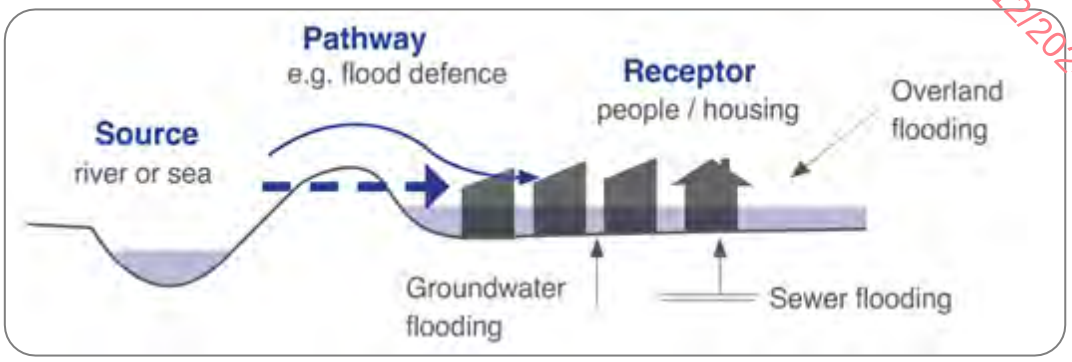


Figure 3 – Source-pathway-receptor model
(*The Planning System and Flood Risk Management Guidelines*)

There is an existing inherent risk of any flood event occurring during any given year. Typically, this likelihood of occurrence was traditionally expressed as a 1-in-100 chance of a 100-year storm event happening in any given year. A less ambiguous expression of probability is the Annual Exceedance Probability (AEP), which may be defined as the probability of a flood event being exceeded in any given year. Therefore a 1-in-100-year event has a 1% AEP; similarly, a 100% AEP can be expressed as a 1-in-1-year event.

The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Flood Risk Management Guidelines), published in 2009, set out the best practice standards for flood risk assessment in Ireland. These are summarised in Table 1 below (Table 8.1 from Flood Risk Management Guidelines document).

Development Category	Flooding Source		
	Drainage	River	Tidal/ Coastal
Residential	1% AEP	0.1% AEP	0.1% AEP
Commercial	1% AEP	1% AEP	0.5% AEP
Water-compatible (docks, marinas)	-	>1% AEP	>0.5% AEP

Table 1: Summary of Level of Service: Flooding Source

Under these guidelines, a proposed development site has first to be assessed to determine the flood zone category it falls under. The flooding guidelines define three distinct areas of combined flood risk: Zones A, B, and C. These are described below.

- Zone A – High Probability of Flooding. Where the average probability of flooding from rivers and sea is highest (greater than 1% AEP for fluvial flooding or 0.5% AEP for tidal flooding).
- Zone B – Moderate Probability of Flooding. Where the average probability of flooding from rivers and sea is moderate (between 0.1% AEP and 1% AEP for fluvial flooding, and between 0.1% AEP and 0.5% AEP for tidal flooding).
- Zone C – Low Probability of Flooding. All areas outside Zones A and B. Where the probability of flooding from rivers and sea is lowest (less than 0.1% AEP for both fluvial and coastal flooding).

Figure 4 – Extract of DCC 2022-2028 SFRA Composite Flood Risk Mapping
(background imagery source: Dublin City Council)

A review of flood risk mapping contained within the *Dublin City Development Plan 2022*–2028 Strategic Flood Risk Assessment, an extract of which is shown in Figure 4, shows that the eastern

portion of the subject site to be located in Flood Zone A and B, with the remainder within Flood Zone C. The relevant flood risk map is provided in full within Appendix A.

It is a requirement of Dublin City Council, the *Greater Dublin Strategic Drainage Study* (DCC 2005), and the Flood Risk Management Guidelines that the predicted effects of climate change be incorporated into any proposed design. Table 2 below indicates the predicted climate change variations.

Design Category	Predicted Impact of Climate Change
Drainage	20% Increase in rainfall
Fluvial (river flows)	20% Increase in flood flow
Tidal / Coastal	Minimum Finished Floor Level 4.0 – 4.15m AOD

Table 2: Predicted climate change variations

The Flood Risk Management Guidelines provide an 'appropriateness' matrix for various developments and their potential risk factors. This matrix, reproduced in Table 3 below, indicates whether a proposed development requires further analysis in the form of a justification test. The Flood Risk Management Guidelines classify commercial offices as 'less vulnerable development'.

Development Category	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable Development	*Justification Test Required*	*Justification Test Required*	Appropriate
Less Vulnerable Development	*Justification Test Required*	Appropriate	Appropriate
Water-compatible Development	Appropriate	Appropriate	Appropriate

Table 3: Flood Zone vs. Justification Test Matrix

As previously noted, a portion of the subject site is located within Flood Zones A and B. As such, a justification test is carried out. Please refer to Section 7.0 for the justification test on the subject site.

4.0 PAST FLOODING EVENTS

A review of the Office of Public Works flood maps database (at www.floodinfo.ie) does not indicate any recorded historical instances of flooding on or near the development site, from any source. See Figure 5 below and the OPW Past Flood Event Local Area Summary Report included as Appendix B.

Figure 5 – OPW Mapping of Past Flood Events
(background imagery source: www.floodinfo.ie)

5.0 SPECIFIC FLOOD RISKS

5.1 Fluvial Flooding

Recent modelling of the surrounding area as part of the *Liffey Catchment Flood Risk Assessment and Management Study* (CFRAMS) project indicates that the subject site is outside of the area at risk from a 0.1% AEP fluvial flooding event. The relevant CFRAMS fluvial flood extent map (as published at www.floodinfo.ie) is included within Appendix C to this report; an extract is shown in Figure 6.

The risk of fluvial flooding impacting upon the subject development is therefore negligible, even during a 1-in-1000-year flooding event, and no mitigation measures are required.

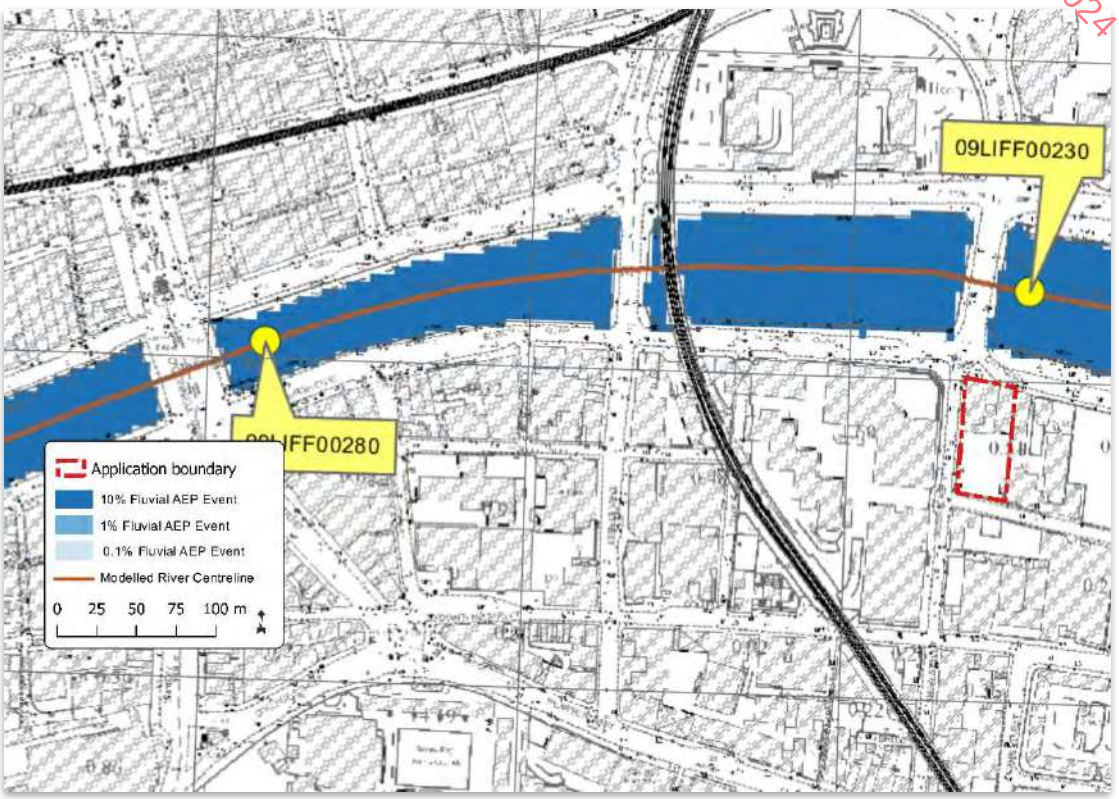


Figure 6 – CFRAMS Mapping of Fluvial Flood Risk Extents
(background imagery source: Office of Public Works)

5.2 Tidal Flooding

Recent modelling of the surrounding area as part of the Liffey Catchment Flood Risk Assessment and Management Study (CFRAMS) project indicates that the subject site is located within Flood Zone A and Flood Zone B. The relevant CFRAMS tidal flood extent map (as published at www.floodinfo.ie) is included within Appendix C to this report; an extract is shown in Figure 7.

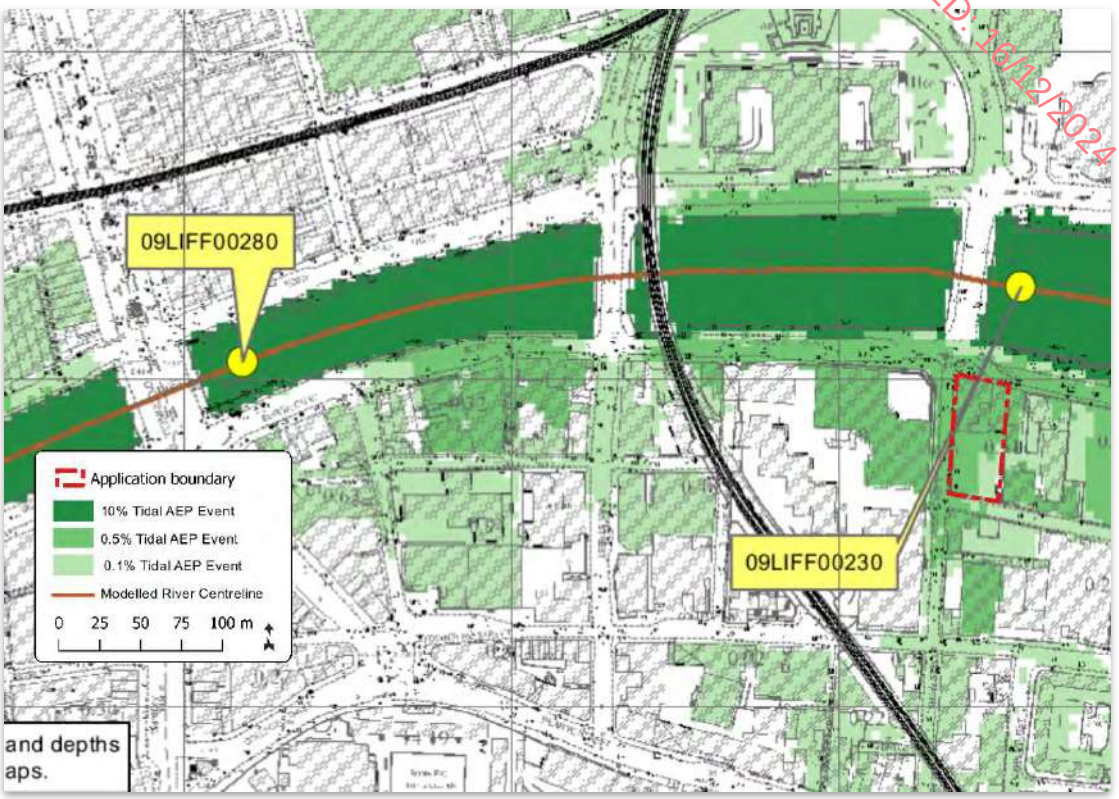


Figure 7 – CFRAMS Mapping of Tidal Flood Risk Extents
(background imagery source: Office of Public Works)

The 2017 CFRAMS Tidal Flood Extents Maps include node point 09LIFF00230 which is the closest note to the proposed development site. This node indicates the tidal flood level for the 0.5% AEP of 3.12m AOD. It is worth noting that the majority of the ground floor level of the proposed development will be set at 4.00m AOD, in order to set the floor level above the flood protection level of 3.92m AOD which takes into account climate change allowance off 500mm and a 300mm freeboard allowance (3.12m AOD + 0.30m+0.50m = 3.92m AOD).

Given that the proposed development is partially located within Flood Zone A justification test has been undertaken. For details of the justification test and proposed tidal flooding mitigation measures refer to section 7 of this report.

5.3 Pluvial Flooding

Pluvial flooding is flooding that has originated from overland flow resulting from high intensity rainfall. The *Dublin City Development Plan 2022-2028* Strategic Flood Risk Assessment includes a map of modelled pluvial flooding depths for a 3-hour duration rainfall event with 1% AEP. For

such a rainfall event, this model indicates that the existing site may experience pluvial flooding up to a depth of approximately 0.3m along the western boundary of the site. This map is included within Appendix A to this report; an extract of the map is shown in Figure 8.

However, the proposed development site will be fitted with an attenuation system of 121m3 and limiting storm water run-off to 2 l/s provided for the 1-in-100-year extreme storm event increased by 20% for the predicated effects of climate change. By reducing the run-off from the site into the local authority drainage system the potential risk of flooding from pluvial action is deemed to be within acceptable limits.

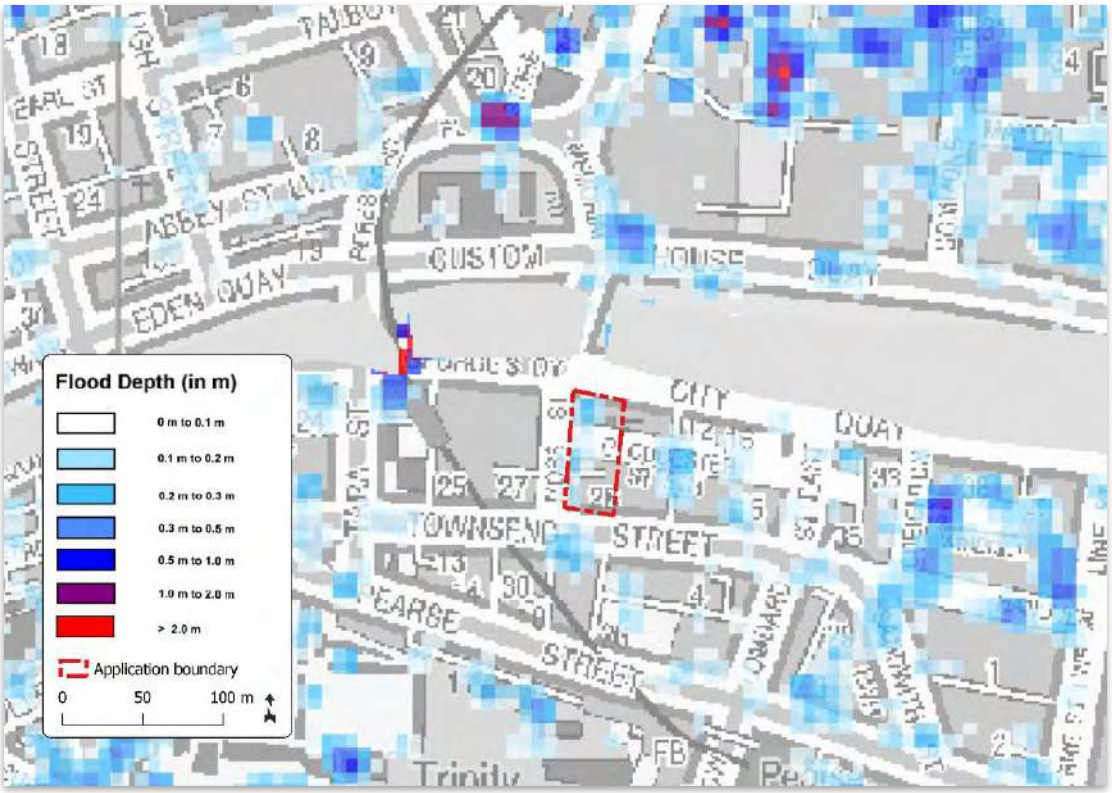


Figure 8 – Extract of DCC 2022-2023 SFRA Pluvial Flood Depth Mapping
(background imagery source: DCC)

5.4 Groundwater Flooding

A review of the Geological Survey of Ireland (GSI) interactive maps (available at www.gsi.ie) shows that the development site is underlain with dark limestone and shale ('calp') of the Lucan Formation. The site is shown as overlaying both a locally important gravel aquifer and a locally important bedrock aquifer that is "moderately productive only in local zones" and is in

an area of low groundwater vulnerability. See Appendix F for GSI mapping of the area encompassing the development site.

5.5 Infrastructure flooding

As part of Dublin City Council survey of the drainage network of Dublin, the Greater Dublin Strategic Drainage Study (GDSDS), a review of the drainage assets in Dublin was carried out. From the survey, hydraulic performance mapping was developed to give an indication of the current and predicted hydraulic performance of sewers up to 2031. The GDSDS was published in 2005 and alterations to the local drainage arrangements have taken place since its publication.

The GDSDS mapping covering the development site indicates that the existing combined sewer in Moss Street, to which it is proposed to discharge foul and storm water from development, is predicted to surcharge for 1 or 2 year return period events, as is the combined sewer in Gloucester St South to which it connects. The proposed development site will include an attenuation system which reduces the hydraulic pressure on the public network during extreme rainfall events. See Appendix E for the relevant GDSDS Hydraulic Performance Map, an extract of which is shown in Figure 9.

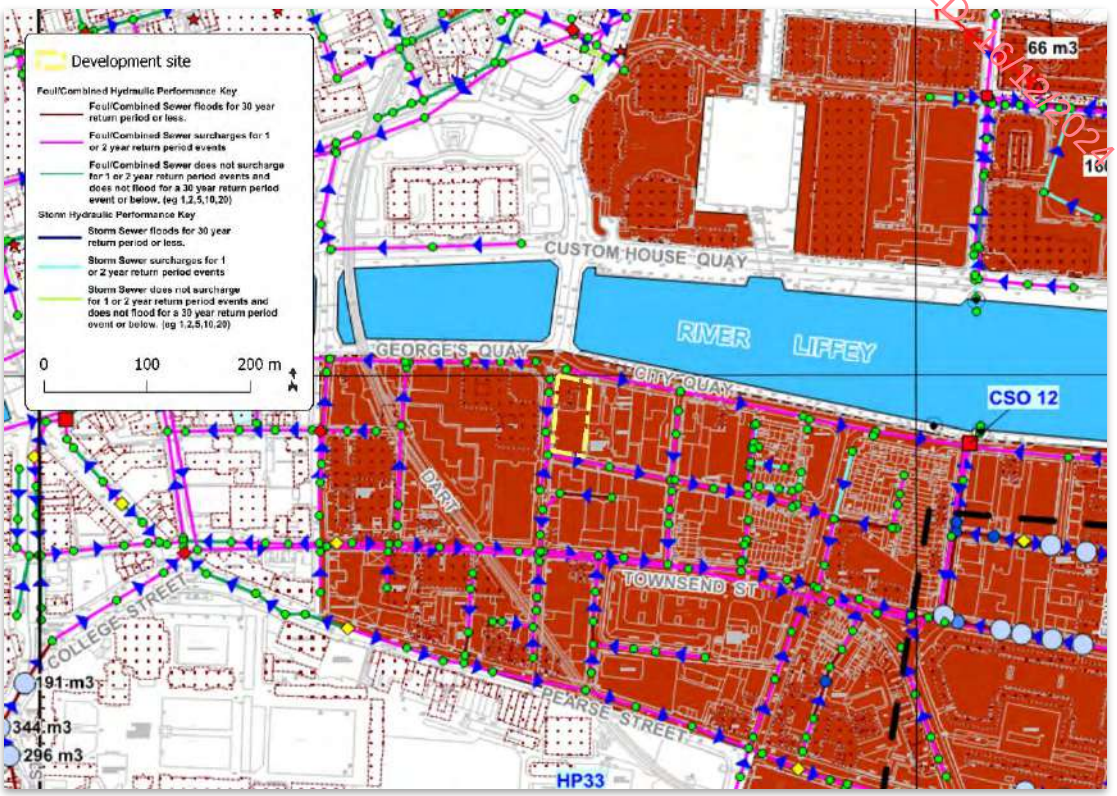


Figure 9 – Extract of 2031 GDSDS System Performance Assessment Map
(background imagery source: Dublin Drainage)

6.0 POTENTIAL FOR DEVELOPMENT TO CONTRIBUTE TO OFF-SITE FLOODING

The proposed development will include an attenuation system. The attenuation tank has been sized for a 1-in-100-year extreme storm event, increased by 20% for the predicted effects of climate change. The attenuation will release the storm water in a controlled manner after the peak storm duration has passed. An attenuation storage volume of 121m3 is required to ensure that stormwater runoff from the development does not exceed 2.0 l/s. The relevant calculations, as well as a more detailed description of the proposed attenuation system, are given in the accompanying Engineering Services Report.

The existing site is currently largely occupied by hardstanding area, with no attenuated stormwater drainage arrangements. By restricting stormwater outflow as described, the proposed development shall therefore reduce the loading on the public drainage system locally during high intensity rainfall events and shall also reduce the risk of neighbouring sites flooding due to stormwater runoff from the subject site.

7.0 JUSTIFICATION TEST

Given the location of the development site, the only source of risk of flooding would be Tidal Flooding as shown in Figure 7 of this report.

A justification test has been carried out below according to the *Section 5 Application of the Justification Test in development management of 'The Planning System and Flood Risk Assessment (Guidelines for Planning Authorities)'*.

When considering proposals for development, which may be vulnerable to flooding, and that would generally be inappropriate as set out in Table 3.2, the following criteria must be satisfied:

1. *The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines.*

   Response

   As mentioned in the Strategic Flood Risk Assessment (Area 3 - Liffey: O'Connell Bridge to Tom Clarke Bridge) of the DCC Development Plan 2022-2028, "High density Commercial and Residential development (some infill and some redevelopment) would be a natural extension of existing development. Development will be required within both Flood Zones A and B, so the Justification Test has been applied. Development will be permitted in Flood Zone C". The proposed development site is zoned as a high density commercial residential development zone.

   The development site comprises of existing surface car parking area and building with unattenuated discharge into the combined sewer system, where there was no flooding reported in the recent years.

2. *The proposal has been subject to an appropriate flood risk assessment that demonstrates:*
   - *i. The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;*
   - *ii. The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible;*
   - *iii. The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as*

regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access; and

iv. The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

Response 2.i

Currently the subject lands have an unattenuated discharge into the combined sewer system. It is proposed as a part of the proposed development that the surface water drainage strategy shall restrict the discharge rate which in turn will reduce the hydraulic pressure on the existing combined sewer network during rainfall events this will in turn help reduce the overall flood risk in and around the development site. The proposed development will be provided with Sustainable Drainage System (SuDS) measures including green roofs, and attenuation tank. As such, the proposed development will reduce risk of Pluvial flooding on the subject site and neighbouring lands.

Response 2.ii and 2.iii

It is proposed that the development shall be provided with attenuation tank, SuDS including green roof within the development. The nearest node point to the development site is 09LIFF00230 indicates the flood level for the 0.5% AEP is 3.12m AOD. It is worth noting that the majority of the ground floor level of the proposed development will be set at 4.00m AOD, in order to set the floor level above the flood protection level of 3.92m AOD which takes into account climate change allowance off 500mm and a 300mm freeboard allowance (3.12m AOD + 0.30m+0.50m = 3.92m AOD). In addition, the proposed development shall implement flood resistant and flood resilient construction techniques listed further below.

Uses located under the level of 4.00m AOD will include car parking, cycle parking, art/ cultural space, plant and storage area. These areas will be defended by most notably flood barriers raised up to 4.00m AOD and by and a combination of other flood resilience and flood resistance measures listed further below. It is also worth noting that Flood Warning and Flood Evacuation plan that will be prepared during the detail

design stage will include actions associated with these areas in a case tidal flood alerts issued by either Triton, Tidewatch or DCC Alerts.

The above will ensure that the flood risk to people, property, the economy, and the environment shall be mitigated as far as reasonably possible.

In relation to the flood resistance and flood resilience, compliance with the following Ciria documents will be ensured through the detail design of the proposed development:

- Code of practice for property flood resilience 2nd edition (C790A)
- Guidance on the code of practice for property flood resilience (C790B)
- Making your property more flood resilient (C790C)

During the detail design the below listed flood resilience and flood resistance measures will be implemented within the design:

- Non-return valves on the drains and pipes,
- Fitting automatic anti-flood airbricks,
- Demountable flood barriers,
- Covers for airbricks, and appliance vents,
- Utility meters to be positioned above the likely height of flood water,
- Ground level walls to be flood resistant construction,
- Avoid the use of fitted carpets and timber floors at ground level and level below.

Refer to CSC drawing No. 16CQ-CSC-XX-GF-DR-C-0020 that illustrates the proposed locations of ground floor flood barriers.

In relation to the Flood Warning and Evacuation Plan it is worth noting that the plan does not remove the risk of flooding of the development however it does provide means those working in the development shall be made aware of the flood hazard and it will identify

any procedures that will enable the staff to avoid being directly exposed to the hazard in any future flood event that may affect the proposed development.

Flood Warning and Evacuation Plan will be prepared during the detail design stage of the proposed development and the Plan will include the following elements:

- Raise awareness of the flood hazard at the location specified by the plan,
- Define the flood warnings and estimated lead-in time available,
- Plan will be integrated with Triton, Tidewatch and DCC Alerts, tidal flood forecasting and warning systems operated by DCC,
- Detail how, when and by who the Plan is triggered,
- Define the responsibilities of those participating in the Plan,
- Outline the evacuation procedure and the safe evacuation route away from the development and in the event that evacuation is not an option, identify the place of safe refuge.
- Safe refuge area should be located above design flood event level and is to have access to clean water and medical equipment.
- Establish the procedure for implementing, monitoring and maintaining the Plan.

In relation to the evacuation, if required, this should be undertaken before a flood event occurs, not during the event. Evacuation during a flood event should only occur in exceptional circumstances where Flood Warning has not reached either the occupants or relevant management company responsible for triggering the Flood Warning and Evacuation Plan, and its deemed safe to do so by the Emergency Services.

Response 2.iv

In regard to the wider planning objectives that relate to urban design and streetscape elements the proposed development has been designed to respond to the established character of the city centre area in which it is situated and follows central government policy and Dublin City Council Development Plan. For details of the urban

design of the proposed development including the streetscape element refer to HJL Architects documents and drawings which accompany this planning application.

In conclusion, the proposed development is justified in accordance with *Dublin City Development Plan 2022-2028* with the justification points above.

8.0 CONCLUSIONS

The Site Specific Flood Risk Assessment has been carried out in accordance with the requirements of the national flood guidelines and Dublin City Council's Development Plan. Its conclusions are summarised as follows:

- The development site historically has no recorded flood events, as noted in the OPW's historical flood maps.
- Predicted flood hazard mapping for fluvial flood events shows that the proposed development site is under negligible risk of flooding from this source.
- Tidal flood mapping illustrates that the subject site is located within Flood Zone A and Flood Zone B. With the majority of the ground floor level of the proposed development being set at 4.00m AOD, in order to set the floor level above the flood protection level of 3.92m AOD which takes into account climate change allowance off 500mm and a 300mm freeboard allowance (3.12m AOD + 0.30m+0.50m = 3.92m AOD), and with the implementation of flood resistance and flood resilience mitigation measures it is deemed that the risk of tidal flooding has been adequately addressed given the subject site location and proposed use.
- Predicted flood hazard mapping for pluvial flood events show that the existing site is at moderate risk of flooding from these sources as at present the existing site has unattenuated discharge. However, the proposed development will allow for an appropriate surface water drainage system inclusive of a storm water attenuation sized to address a 1-in-100-year extreme storm event, increased by 20% for predicted climate change effects. This will significantly reduce the volume of storm water leaving the site during extreme storm events, which in turn will have the effect of reducing the loading on the existing public drainage system and reducing the risk of pluvial flooding on subject site and neighbouring sites.
- The development's basement shall be constructed to withstand groundwater ingress, mitigating the risk of flooding from this source.

The proposed development is deemed to be suitable for the site location, as historical and potential flood routes have been reviewed and the likelihood of the development being subject to flooding is low, given the implementation of the mitigation measures described.

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APPENDIX A

DUBLIN CITY COUNCIL FLOOD RISK MAPS

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council

Dublin City Development Plan 2022-2028

Composite Flood Map for Dublin City Council

Note: The Composite Flood Map, and all other map extracts, illustrate Flood Zone A, B and Defended Areas (in red), where defended areas indicates lands defended to the 1% AEP fluvial and /or the 0.5% AEP tidal flood events and should therefore be considered also to be Flood Zone A.

Flood Zone A

Flood Zone B

Flood Zone C

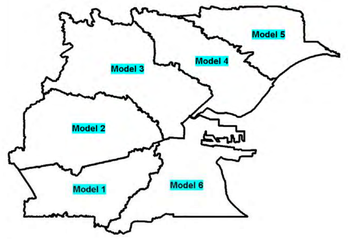
Defended

City Boundary

Refer To OPW Website – Floodinfo.ie

John O'Hara
Dublin City Planner

Flood Depth Map



Dublin City Model boundaries

Legend

Flood Depth (in m)

- 0 m to 0.1 m
- 0.1 m to 0.2 m
- 0.2 m to 0.3 m
- 0.3 m to 0.5 m
- 0.5 m to 1.0 m
- 1.0 m to 2.0 m
- > 2.0 m
- Model Boundary

Notes

LEGEND

- Motorway and Junction Number
- Bus Route, Route No. and Terminus
- Thoroughfares Named and National Route Number
- Thoroughfares Unnamed (see street index)
- Public Buildings etc.
- Built-up Areas
- Parks, Ornamental Grounds, Golf Courses etc.
- Water
- Churches
- Garda Síochána Stations
- Railway Stations
- A grid square on this map represents 1 square Kilometre. SAMPLE REFFERENCE MERRION SQUARE L 14

0 1km

1000 Metres 500 0

JACOBS

Client	Dublin City Baile Átha Cliath
Project	FloodResilienCity Project
Title	Type 1 Model - Flood Depth Map Dublin - 1% AEP Event - 3hr Duration
Drawing Status	DRAFT
Job No.	32102500
Figure No.	32102500/D/OV/FD/0010
Revision	0
Scale	
Date :	

Drawn	MM	Checker	MV	Review	PS	Approved	CF

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APPENDIX B

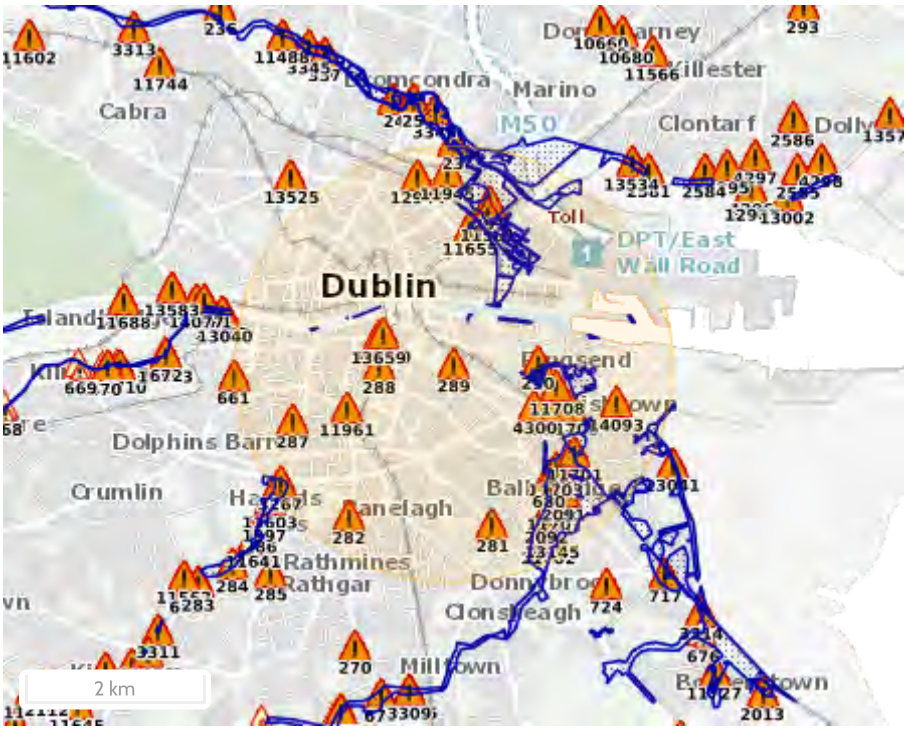
OPW PAST FLOOD EVENT LOCAL AREA SUMMARY REPORT

Past Flood Event Local Area Summary Report

OPW Oifig na nOibreacha Poiblí Office of Public Works

Report Produced: **5/9/2024 15:13**

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.



Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

36 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Flooding at Dublin City on 30/07/2019 (ID-13659) **Additional Information:** Reports (0) Press Archive (0)	30/07/2019	Approximate Point
2.	Poddle Limekiln Lane Sept 1931 (ID-3267) **Additional Information:** Reports (1) Press Archive (0)	02/09/1931	Approximate Point
3.	Report of flooding at Jones Road, Dublin 3 on 26th July 2013 (ID-11945) **Additional Information:** Reports (1) Press Archive (0)	25/07/2013	Approximate Point
4.	Flooding at Trinity College, Dublin 2, 26th July 2013 (ID-11960) **Additional Information:** Reports (1) Press Archive (0)	25/07/2013	Approximate Point
5.	Flooding on Wexford St, Dublin 2 on 26th July 2013 (ID-11961) **Additional Information:** Reports (1) Press Archive (0)	25/07/2013	Approximate Point
6.	Dodder Oct 1987 (ID-680) **Additional Information:** Reports (3) Press Archive (0)	20/10/1987	Approximate Point

	Name (Flood_ID)	Start Date	Event Location
7.	Poddle August 1986 (ID-32) Additional Information: Reports (9) Press Archive (1)	24/08/1986	Area
8.	Dodder August 1986 (ID-1) Additional Information: Reports (21) Press Archive (18)	25/08/1986	Area
9.	Poddle Limekiln Lane Aug 1905 (ID-1998) Additional Information: Reports (1) Press Archive (0)	24/08/1905	Approximate Point
10.	Dodder Ballsbridge Sept 1931 (ID-2091) Additional Information: Reports (8) Press Archive (7)	02/09/1931	Approximate Point
11.	Dodder Anglesea Road Dec 1958 (ID-2092) Additional Information: Reports (7) Press Archive (0)	18/12/1958	Approximate Point
12.	Bath Avenue June 1963 (ID-4300) Additional Information: Reports (4) Press Archive (0)	10/06/1963	Exact Point
13.	Dodder Donnybrook June 1963 (ID-281) Additional Information: Reports (4) Press Archive (3)	10/06/1963	Exact Point
14.	Rathmines Lower June 1963 (ID-282) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
15.	Clanbrassil Street June 1963 (ID-287) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
16.	Grafton Street June 1963 (ID-288) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
17.	Fenian Street June 1963 (ID-289) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
18.	Ringsend June 1963 (ID-290) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
19.	North Strand Road June 1963 (ID-291) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
20.	Flooding at Irishtown on 07/12/2021 (ID-14093) Additional Information: Reports (0) Press Archive (0)	07/12/2021	Approximate Point
21.	Flooding at Ballsbridge on 14/11/2014 (ID-13145) Additional Information: Reports (0) Press Archive (0)	14/11/2014	Approximate Point
22.	Tolka November 2002 (ID-5) Additional Information: Reports (143) Press Archive (13)	13/11/2002	Area
23.	Dublin City Tidal Feb 2002 (ID-456) Additional Information: Reports (45) Press Archive (27)	01/02/2002	Area
24.	Flooding at Bessborough Avenue, North Strand, Dublin 3 on 24th Oct 2011 (ID-11561) Additional Information: Reports (1) Press Archive (0)	23/10/2011	Exact Point
25.	Tolka December 1954 (ID-4) Additional Information: Reports (16) Press Archive (9)	08/12/1954	Area

	Name (Flood_ID)	Start Date	Event Location
26.	Flooding at Shamrock Place, Cottages and Terrace, Dublin 3 on 24th Oct 2011 (ID-11655) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Exact Point
27.	Flooding at Bath Avenue, Sandymount, Dublin 4 on 24th Oct 2011 (ID-11706) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Exact Point
28.	Flooding at Anglesea Road, Ballsbridge, Dublin 4 on 24th Oct 2011 (ID-11702) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Exact Point
29.	Flooding at Herbert Cottages, Ballsbridge, Dublin 4 on 24th Oct 2011 (ID-11703) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Exact Point
30.	Flooding at RDS, Ballsbridge, Dublin 4 on 24th Oct 2011 (ID-11707) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Exact Point
31.	Flooding at Havelock Square, Sandymount, Dublin 4 on 24th Oct 2011 (ID-11725) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Exact Point
32.	Flood report for Shamrock Cottages on the 24th October 2011 (ID-12684) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Approximate Point
33.	Dodder Anglesea Road Nov 1965 (ID-238) **Additional Information:** Reports (11) Press Archive (10)	17/11/1965	Approximate Point
34.	Flooding at Railway Cottages, Ballsbridge, Dublin 4 on 24th Oct 2011 (ID-11701) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Exact Point
35.	Flooding at ESB Sportsco, Ringsend, Dublin 4 on 24th Oct 2011 (ID-11708) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Exact Point
36.	Flooding at Dublin City on 25/07/2013 (ID-12944) **Additional Information:** Reports (0) Press Archive (0)	25/07/2013	Approximate Point

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APPENDIX C

CFRAMS FLOOD RISK MAPPING

Node Label	Water Level (OD) 10% AEP	Flow (m³/s) 10% AEP	Water Level (OD) 1% AEP	Flow (m³/s) 1% AEP	Water Level (OD) 0.1% AEP	Flow (m³/s) 0.1% AEP
09LIFF00371	2.55	160.64	2.63	213.22	2.77	280.83
09LIFF00333	2.52	165.79	2.58	217.56	2.68	284.77
09LIFF00328	2.51	166.49	2.57	218.17	2.66	285.34
09LIFF00280	2.46	172.70	2.47	224.47	2.49	291.84
09LIFF00230	2.44	180.89	2.44	232.15	2.44	299.59

315000 315200 315400 315600 315800 316000 316200 316400

235000 234800 234600 234400 234200 234000 233800

09LIFF00230

09LIFF00280

09LIFF00328

09LIFF00371

09LIFF00333

For river Poddle flood extents and depths
Refer to Poddle HPW maps.

0 50 100 200 300 400 500 Metres

IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

Legend

- 10% Fluvial AEP Event
- 1% Fluvial AEP Event
- 0.1% Fluvial AEP Event
- Modelled River Centreline
- AFA Extents
- Node Point
- Node ID Node Label

FINAL

REV:	NOTE:	DATE:
01	Amendments to Flood Extents.	05/12/16

EASTERN CFRAM STUDY

The Office of Public Works
Jonathan Swift Street
Trim
Co Meath

Elmwood House
74 Boucher Road
Belfast
BT12 6RZ

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F +44(0) 28 90 668286
W www.rpsgroup.com
E ireland@rpsgroup.com

Map:
Liffey Fluvial Flood Extents

Map Type:	EXTENT
Source:	FLUVIAL
Map Area:	HPW
Scenario:	CURRENT
Drawn By : C.C.	Date : 9 May 2017
Checked By : A.S.	Date : 9 May 2017
Approved By : S.P.	Date : 9 May 2017

Drawing No. :
E09LIF_EXFCD_F1_03

Map Series : Page 3 of 8

Drawing Scale : 1:5,000 @ A3

Node Label	Water Level (OD) 10% AEP	Flow (m^3/s) 10% AEP	Water Level (OD) 0.5% AEP	Flow (m^3/s) 0.5% AEP	Water Level (OD) 0.1% AEP	Flow (m^3/s) 0.1% AEP
09LIFF00371	2.73	N/A	3.16	N/A	3.38	N/A
09LIFF00328	2.71	131.89	3.14	135.63	3.37	137.96
09LIFF00280	2.68	N/A	3.12	N/A	3.35	N/A
09LIFF00230	2.67	N/A	3.12	N/A	3.35	N/A

09LIFF00280

09LIFF00230

09LIFF00371

09LIFF00328

For river Poddle flood extents and depths refer to Poddle HPW maps.

315000 315200 315400 315600 315800 316000 316200 316400

235000 234800 234600 234400 234200 234000 233800

0 50 100 200 300 400 500 Metres

IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

Legend

- 10% Tidal AEP Event
- 0.5% Tidal AEP Event
- 0.1% Tidal AEP Event
- Modelled River Centreline
- AFA Extents
- Node Point
- Node ID Node Label

FINAL

REV:	NOTE:	DATE:
01	Amendments to Flood Extents.	05/12/16

EASTERN CFRAM STUDY

OPW
RPS

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W www.rpsgroup.com
E ireland@rpsgroup.com

Map:
Liffey Tidal Flood Extents

Map Type:	**EXTENT**		
Source:	**TIDAL**		
Map Area:	**COASTAL**		
Scenario:	**CURRENT**		
Drawn By :	**C.C.**	**Date :**	**9 May 2017**
Checked By :	**A.S.**	**Date :**	**9 May 2017**
Approved By :	**S.P.**	**Date :**	**9 May 2017**

Drawing No. :
E09LIF_EXCCD_F1_03

Map Series : Page 3 of 8

Drawing Scale : 1:5,000 @ A3

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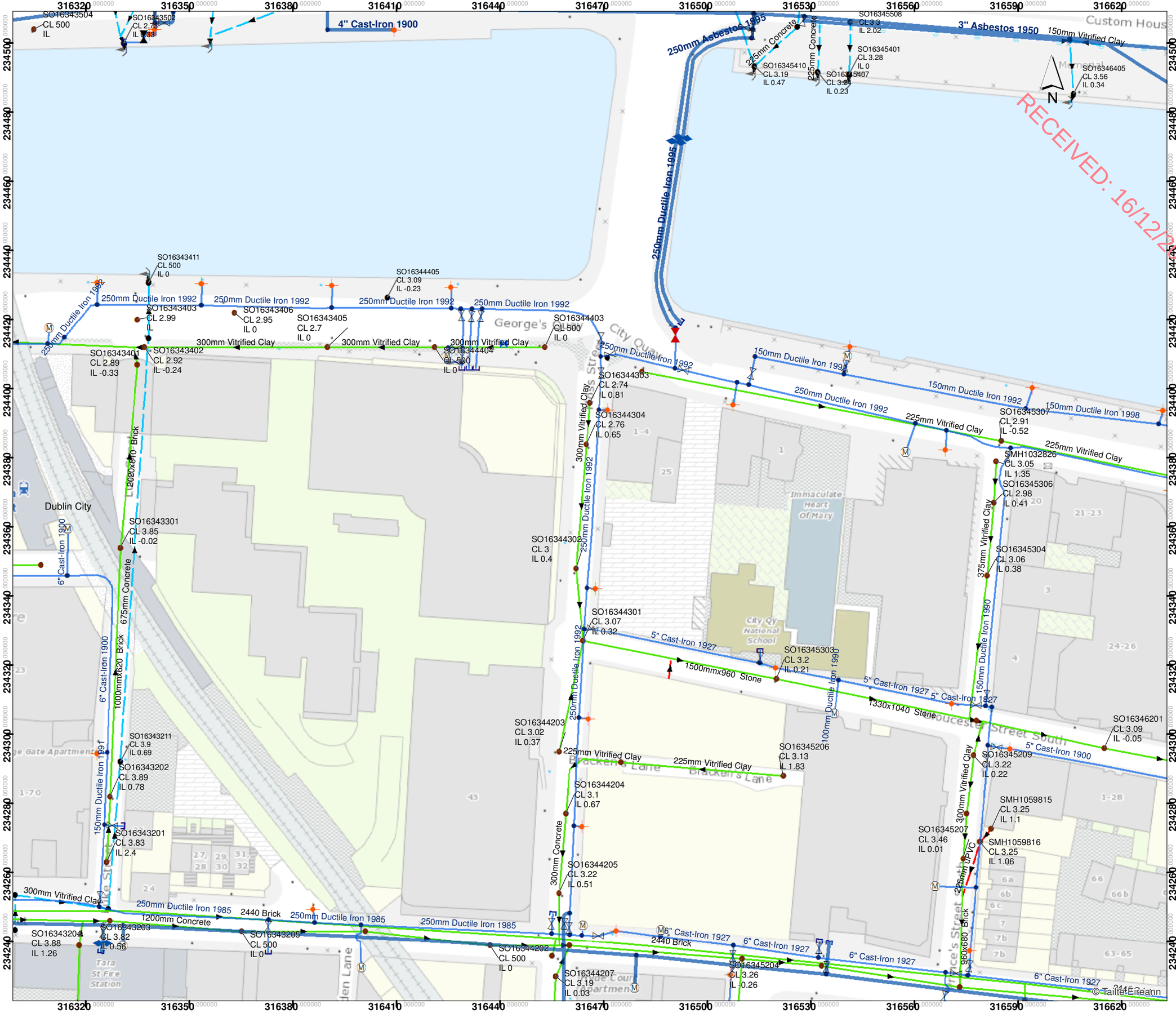
APPENDIX D

IRISH WATER DRAINAGE AND SUPPLY RECORDS



Legend

Uisce Éireann Irish Water

- Unknown Meter ; Other Meter
- Sluice Valve Open
- Sluice Valve Closed
- Sluice Valve Closed
- Double Air Control Valve

Water Hydrants

Hydrant Function

- Fire Hydrant
- Water Kiosk
- Cap
- Other Fittings

Water Distribution Mains

Owned By

- Irish Water
- Irish Water

Sewer Manholes

Manhole Type

- Standard
- Gravity - Combined
- Gravity - Foul

Storm Manholes

Manhole Type

- Standard

Storm Discharge Points

Discharge Type

- Outfall
- Surface Gravity Mains

Storm Inlets

Inlet Type

- Gully

Print Date: 16/08/2024

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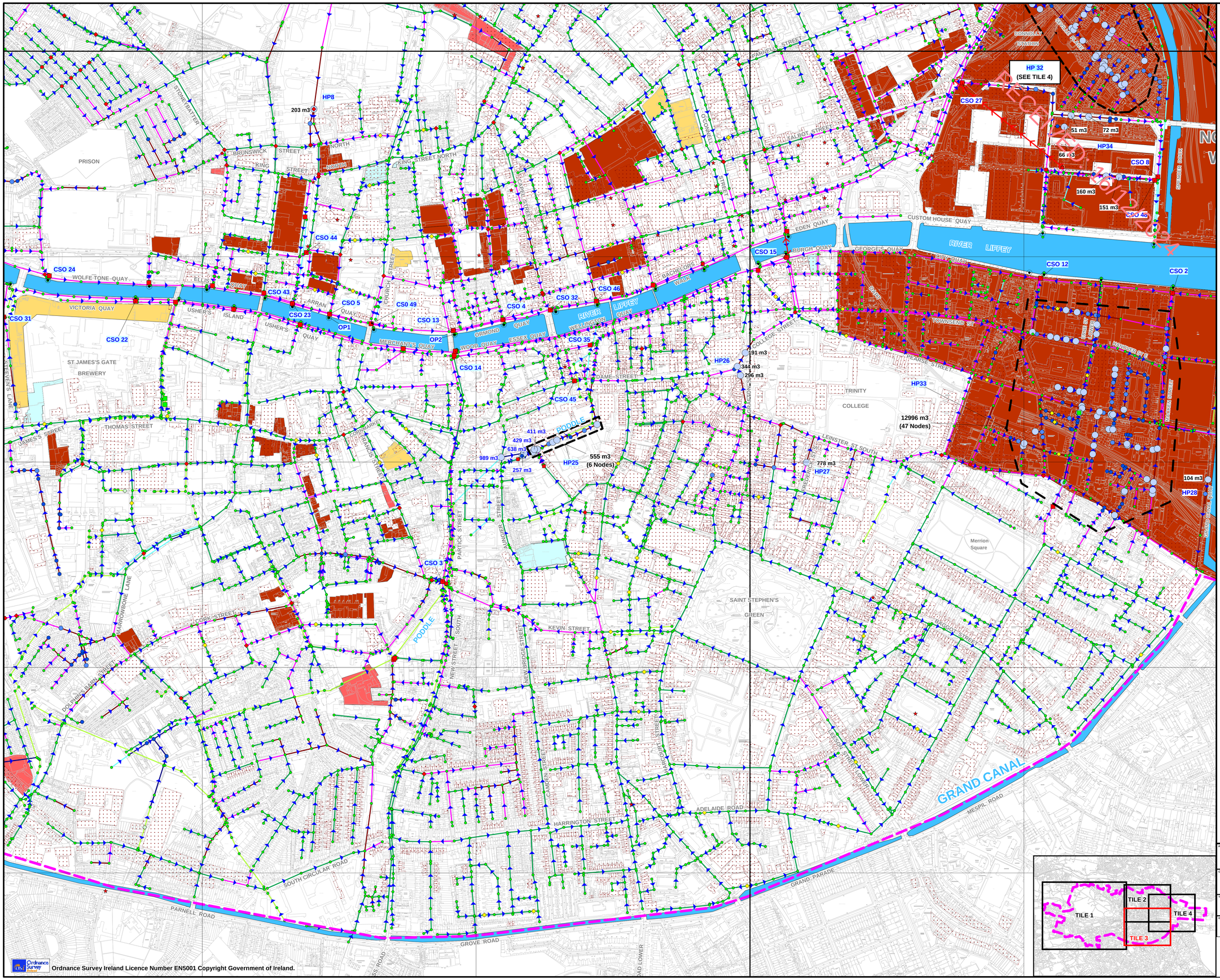
APPENDIX E

GDSDS 2031 PERFORMANCE MAP



Legend

- Wastewater Treatment Works
- County Council Boundaries
- Catchment Boundary
- Rising Main (Coloured as sewer)
- Sewer not included in hydraulic model
- Direction of Flow (on sewer line)
- River/Watercourse
- Culverted River/Watercourse
- 1:1000 OS Grid Line Boundaries
- 1:5000 OS Grid Line Boundaries
- Combined Sewer Overflow
- Foul/Combined Pumping Station
- Foul/Combined Bifurcation
- Foul/Combined Apex Manhole
- Foul/Combined Flow Management Chamber
- Storm Water Overflow to Foul/Combined
- Storm Water Bifurcation
- Storm Water Apex Manhole

Flooding Performance Key

- Flooding greater than 50m3 Volume for 5yr Return Period Event (Volume m3)
- Flooding between 25m3 and 50m3 Volume for 5yr Return Period Event
- Flooding less than 25m3 Volume for 5yr Return Period Event
- Modelled Manhole does not flood for 5 year Return Period Event
- 75m3 — 1:5 year Foul/Combined flood volume
- 75m3 — 1:5 year Storm flood volume
- Historically Reported Flooding Incidents caused by Hydraulic Overloading
- Outfall

Foul/Combined Hydraulic Performance Key

- Foul/Combined Sewer floods for 30 year return period or less.
- Foul/Combined Sewer surcharges for 1 or 2 year return period events
- Foul/Combined Sewer does not surcharge for 1 or 2 year return period events and does not flood for a 30 year return period event or below. (eg 1,2,5,10,20)

Storm Hydraulic Performance Key

- Storm Sewer floods for 30 year return period or less.
- Storm Sewer surcharges for 1 or 2 year return period events
- Storm Sewer does not surcharge for 1 or 2 year return period events and does not flood for a 30 year return period event or below. (eg 1,2,5,10,20)
- Area Covered by EDS/DCC Asset Survey

Important Hydraulic Considerations

- Location of Known Basements
- Zoned Residential Land
- Zoned Science/Technology Parks/Land
- Zoned Industrial Land
- Zoned Commercial Land
- Zoned Land for Mixed Development
- Recently Completed Developments

Catchment Deficiency Reference Key

- HP 1 — Hydraulic Deficiency Reference No (Foul/Combined) (Not included for EDS/DCC Asset Survey area).
- CSO 1 — CSO Deficiency Reference No. (Hydraulic or Environmental)
- OP 1 — Operational Deficiency Reference No.

Notes

1. Results are based on assessment of sewer system under 1, 2, 5, 10, 20, 30, 50 and 100 year return period rainfall events.
2. For colour coding, flooding takes priority over surcharging.
3. Levels referenced in meters to Ordnance Survey Datum, which is Mean Sea Level at Malin Head, Co. Donegal (1970 Adjustment).

Project: GREATER DUBLIN STRATEGIC DRAINAGE STUDY

Catchment: CITY CENTRE/DOCKLANDS CATCHMENT

Title: PHASE 3 - 2031 System Performance Assessment

Drg. No.: GDSDS/MAR3079/F001/P3-003_Tile3

Dublin Drainage — A Strategic Study for Greater Dublin

Drawn	JGA	Chk'd	MCB
Approved	MCB		
Scale	N.T.S.	REVISION	A
Date	7/5/04		

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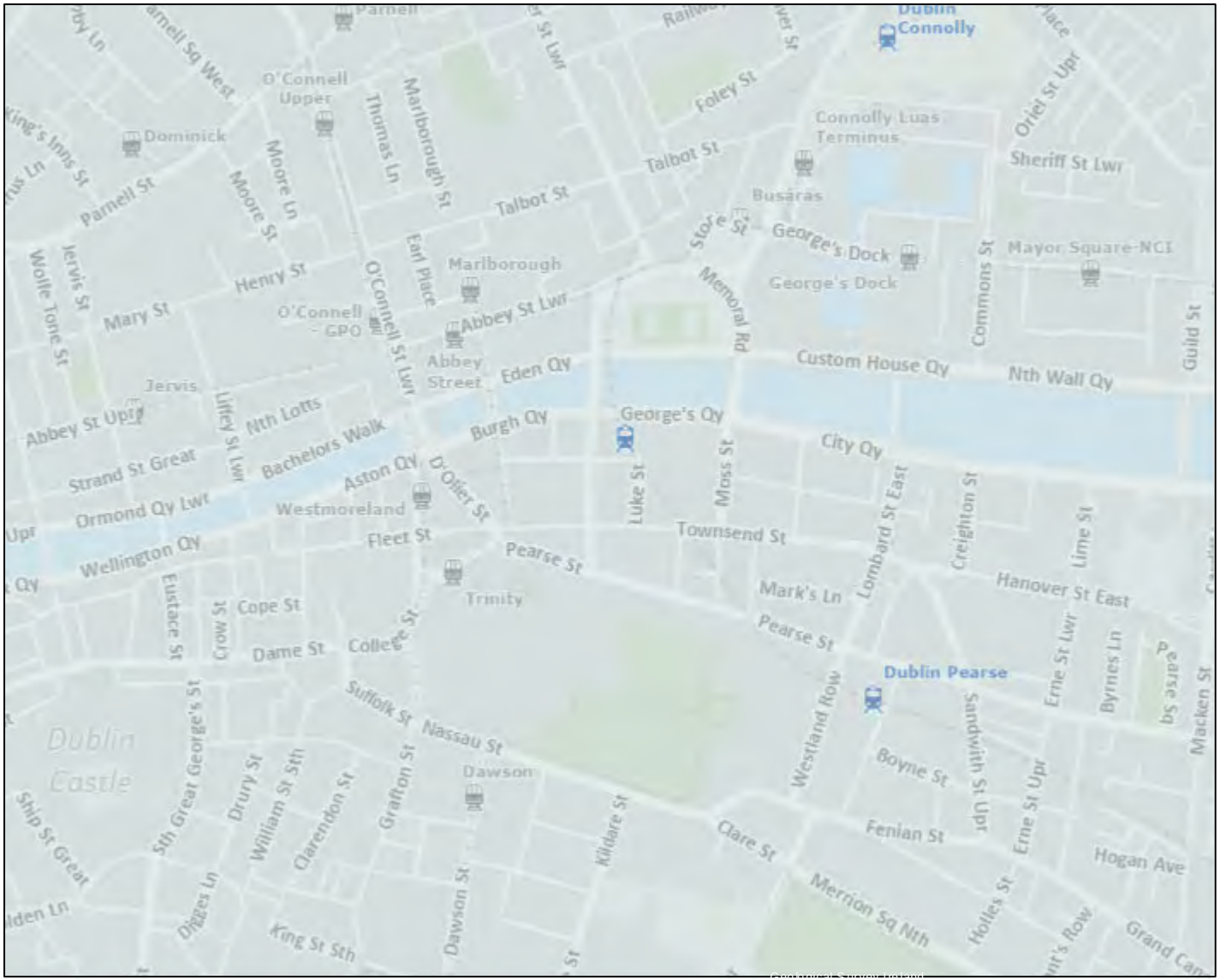
APPENDIX F

GSI GEOLOGY AND HYDROGEOLOGY MAPPING

GSI Bedrock



Scale: 1:10,000

Geological Survey Ireland

N W E S

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

Map Centre Coordinates (ITM) 716,213 734,326

10/22/2024, 4:48:23 PM

Legend

IE_GSI_Structural_Sy...

- Dip of bedding or main foliation, old GSI data
- First foliation parallel to bedding
- Foliation trend, Thorr and Rosses Granites
- Horizontal Bedding
- Strike and dip of bedding, right way up
- Strike and dip of bedding, way up unknown
- Strike and dip of first foliation
- Strike and dip of overturned bedding
- Strike and dip of second foliation
- Strike and dip of third foliation
- Strike and plunge of first generation fold axis
- Strike and plunge of second generation fold axis
- Strike and plunge of third generation fold axis
- Strike of vertical bedding/foliation
- Strike of vertical first foliation
- Bedrock Outcrops

IE_GSI_Geological_Li...

- Anticlinal Axis
- Antiformal axis
- Aquifer Boundary
- Area
- Coal seam
- Dyke
- Fault
- Ghost Line
- Goniatite marine band (R1-R4)
- Lithological boundary offshore
- Metadolerite sheet, mainly sills
- Paleogene/ Tertiary Dyke
- Synclinal Axis
- Synformal axis
- Tectonic Slide, barbs on hanging-wall
- Thin stratigraphical unit, diagrammatic
- Thrust, barbs on hanging-wall side
- Tuff band
- Unconformity, dots on younger side
- X-Section

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