ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Spencer Dock, Block 2, Dublin 1

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Chapter 1:

Introduction and Methodology

1.0 INTRODUCTION AND METHODOLOGY

1.1 INTRODUCTION AND TERMS OF REFERENCE

John Spain Associates, Planning & Development Consultants, have been commissioned by Spencer Place Development Company Ltd. to prepare an Environmental Impact Assessment Report (EIAR) for a proposed strategic housing development of 464 no. units and 120 no. shared accommodation bedrooms(200 no. bed spaces) at lands at Block 2, Spencer Dock, Dublin 1.

The application site is currently under construction for planning application reference Reg. Ref. 2896/18 as amended by Reg. Ref. DSDZ4279/18 for 349 no. residential units and an aparthotel scheme (102 no. units) over basement level. The development under construction has not been subject to an EIAR as it did not exceed the threshold as set out in Schedule 5. The proposed development seeks alterations to this development currently under construction to provide for 464 no. residential apartment units and 200 no. shared accommodation bed spaces. The proposed footprint of the building and basement excavation remains the same as per the permitted development on the site.

It should be noted that the proposed development does not exceed the 500 no. units threshold for residential development however considering the combination of both the shared accommodation (102 no. bedrooms) and the apartment units (464 no.) it was decided to carry out an EIAR on this basis.

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.

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

This EIAR document has been prepared in accordance with 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 EIAR 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 2017 Draft EIA Guidelines published by the EPA.

1.2 DEFINITION OF EIA AND EIAR

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

Article 1(2)(g) 4 of Directive 2014/52/EU states that "environmental impact assessment" means a process consisting of:

(i) the preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2);
(ii) the carrying out of consultations as referred to in Article 6 and, where relevant, Article 7;
(iii) the examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer in

accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7;
(iv) the reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point (iii) and, where appropriate, its own supplementary examination; and
(v) the integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a.

The amended Directive (Directive 2014/52/EU) uses the term environmental impact assessment report (EIAR) rather than environmental impact statement (EIS).

A definition of Environmental Impact Assessment Report (EIAR) has not been included in the revised directive however the EPA Guidelines (2017)[1] provide the following definition:

"A statement of the effects, if any, which proposed development, if carried out, would have on the environment.

The EIAR is prepared by the developer and is submitted to a CA (Competent Authority) as part of a consent process. The CA uses the information provided to assess the environmental effects of the project and, in the context of other considerations, to help determine if consent should be granted. The information in the EIAR is also used by other parties to evaluate the acceptability of the project and its effects and to inform their submissions to the CA.

The EIAR consists of a systematic analysis and assessment of the potential effects of a proposed project on the receiving environment. The amended EIA Directive prescribes a range of environmental factors which are used to organise descriptions of the environment and these factors must be addressed in the EIAR.

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

In summary, EIA is a process for anticipating the effects on the environment caused by development. An EIAR is the document produced as a result of that process and provides information which the competent/ consent authorities use in deciding whether or not to grant consent. Where significant and likely environmental effects are identified that are unacceptable; the EIA process aims to quantify and minimise the impact specified development projects have on the environment through appropriate mitigation measures. The preparation of an EIAR document requires site-specific considerations and the preparation of baseline assessment against which the likely impacts of a proposed development can be assessed by way of a concise, standardised and systematic methodology.

1.3 EIA LEGISLATION

Certain public and private projects that are likely to have significant effects on the environment are subject to EIA requirements derived from EIA Directive 85/337/EC (as amended by Council Directive 97/11/EC, Directive 2003/4/EC, Directive 2009/31/EC, Directive 2011/92/EU and recently Directive 2014/52/EU which amends EIA law in a number of respects by amending Directive 2011/92/EU) which are designed to ensure that projects likely to have significant effects on the environment are subject to a comprehensive assessment of environmental effects prior to development consent being given.

Article 2 of Directive 2014/52/EU provides that Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with the Directive by 16 May 2017.

[1] *Guidelines on the Information to be contained in an Environmental Impact Assessment Report, Environmental Protection Agency, 2017*

The Department of Housing, Planning, Community and Local Government has brought forward the Planning and Development Regulations 2001-2018 to provide for the transposition of the Directive into the Irish planning code. To this effect, the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 have now transposed the 2014 Directive into Irish law.

The Department has also provided an updated to the 2013 "Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment" to provide practical guidance on legal and procedural issues arising from the requirement to undertake EIA in accordance with Directive 2014/52/EU.

These new Guidelines – 'Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment' were published in August 2018. These Guidelines have informed the preparation of this EIAR.

As referenced above, the 2017 Draft Guidelines prepared by the EPA have also informed this EIAR.

1.4 EIA GUIDELINES

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

TABLE 1.1 – EIA GUIDELINES CONSULTED AS PART OF THE PREPARATION OF THIS EIAR

Irish
• Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, August 2018
• Draft Guidelines on the information to be contained in environmental impact assessment reports, EPA, August 2017
• Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems - Key Issues Consultation Paper, Department of Environment, Community and Local Government, 2017.
• Circular letter PL 1/2017 - Advice on Administrative Provisions in Advance of Transposition (2017).
• Development Management Guidelines (DoEHLG, 2007).
• Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003).
• Environmental Impact Assessment (EIA), Guidance for Consent Authorities Regarding Sub-Threshold Development (DoEHLG 2003).
• Guidelines on Information to be Contained in an Environmental Impact Statement (EPA 2002).
European Union (in addition to Directives referenced above)
• Study on the Assessment of Indirect & Cumulative Impacts as well as Impact Interaction (DG Environment 2002).
• EU Guidance on EIA Screening (DG Environment 2001).
• Guidance on EIA Scoping (DG Environment 2001).
• EIA Review Checklist (DG Environment 2001).

The most recent guidelines are the August 2018 EIA Guidelines for Planning Authorities and the Board.

The 2017 EPA draft guidelines have been prepared to help practitioners interpret the amended EIA Directive and in advance of new regulations transposing Directive 2014/52/EU becoming available.

They provide practical guidance to planning authorities, An Bord Pleanála, and other relevant stakeholders, on procedural issues and the EIA process; and outline the key changes introduced by Directive 2014/52/EU.

1.5 SCREENING – REQUIREMENT FOR AN EIA

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

Annex I of the EIA Directive 85/337/EC requires as mandatory the preparation of an EIA for all development projects listed therein.

Schedule 5 (Part 1) of the Planning & Development Regulations 2001 (as amended) transposes Annex 1 of the EIA Directive directly into Irish land use planning legislation. The Directive prescribes mandatory thresholds in respect to Annex 1 projects.

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

Schedule 5 (Part 2) of the Planning & Development Regulations 2001 (as amended) set mandatory thresholds for each project class. Sub-section 10(b) (iii) and (iv) addresses *'Infrastructure Projects'* and requires that the following class of project be subject to EIA:

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

The proposed Strategic Housing Development comprises of *inter alia* the construction of 464 no. residential units and 120 no. shared accommodation bedrooms, and all other ancillary infrastructure such as open space, car parking and new vehicular and cycle links.

The proposed development therefore falls below the thresholds set out above for mandatory Environmental Impact Assessment. Notwithstanding this, an EIAR has been prepared to accompany the subject strategic housing development application to An Bord Pleanála, having regard to the specific characteristics and features of this site, its size, and the quantum of development proposed having regard to the combination of residential units and shared accommodation bedrooms. .

In relation to Screening, EIA Directive 2014/52/EU introduces a new mandatory section, Article 4(4). Article 4(4) introduces a new Annex IIA to be used in the case of a request for a screening determination for Annex II projects. This is information to be provided by the developer on the projects listed in Annex II.

1.6 SCOPING

The EPA Guidelines state that 'Scoping' is a process of deciding what information should be contained in an EIAR and what methods should be used to gather and assess that information. It is defined in the EC guidance[2] as:

> *'determining the content and extent of the matters which should be covered in the environmental information to be submitted in the EIAR'.*

The applicant is committed to ensuring that all of its developments are conducted in a responsible and sustainable manner. A scoping process to identify the issues that are likely to be most important during the Environmental Impact Assessment process was carried out by the applicant, design team and EIAR consultants and informed the format of this EIAR.

As set out within the 2018 EIA Guidelines published by the Department of Housing, Planning and Local Government, Section 7 of the Planning and Development (Housing) and Residential Tenancies Act 2016 and Planning and Development (Strategic Housing Development) Regulations 2017 allow for a prospective applicant to make a request to An Bord Pleanála for an EIA scoping opinion in regard to a proposed Strategic Housing Development (SHD). Such requests are discretionary.

The EIAR prepared for the scheme has endeavoured to be as thorough as possible and therefore the provisions included in the revised EIA Directive and all of the issues listed in Schedule 6, Sections 1, 2 and 3 of the Planning and Development Regulations 2001-2018 and in recent guidance documents have been addressed in the EIAR.

In this context the following topics/issues have been reviewed and addressed in the context of the proposed development:

- Introduction and Methodology,
- Project Description and Alternatives Examined,
- Population and Human Health,
- Archaeology and Cultural Heritage,
- Biodiversity,
- Landscape and Visual Impact,
- Land and Soils,
- Water,
- Air Quality and Climate,
- Noise and Vibration,
- Material Assets,
- Interactions of the Foregoing,
- Principle Mitigation and Monitoring Measures,
- Non-Technical Summary.

In addition to the above a series of standalone reports have been prepared to accompany the application and which have helped inform the above chapters of the EIAR where relevant. Cronin Sutton Consulting Engineers have prepared a Traffic and Transport Assessment Report. Cronin Sutton have prepared a Site Specific Flood Risk Assessment for the site; and Hegarty's Construction for the preparation of the Construction Management Plan. AWN Consulting have produced a Construction and Operational Waste Management Plan. In addition,

[2] Guidance on EIA Scoping, EC, 2001

Visual Lab have prepared photomontages and CGI images and Altemar have prepared an AA Screening Report.

It is necessary to examine each of the aforementioned sections of the EIAR with respect to the impacts that the proposed development may have on the environment. The purpose of this scoping exercise is to shape and mould the EIAR so as not to dismiss any potential impacts that may in fact be significant, and to focus on issues which need to be resolved.

The scope of this EIAR has been informed by the following:

- European Union (Planning and Development)(Environmental Impact Assessment) Regulations 2018
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment August 2018
- Draft Guidelines on the information to be contained in environmental impact assessment reports, EPA, 2017
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems - Key Issues Consultation Paper, Department of Environment, Community and Local Government, 2017.
- Circular letter PL 1/2017 - Advice on Administrative Provisions in Advance of Transposition (2017).
- The requirements of Part X of the Planning and Development Act, 2000, as amended, and Part 10 of the Planning & Development Regulations, 2001-2017;
- The requirements of the Dublin City Development Plan 2016-2022;
- Regional and National Planning Policy Documents;
- The likely concerns of third parties;
- The nature, location and scale of the proposal;
- The existing environment together with any vulnerable or sensitive local features and current uses;
- The planning history and environmental assessments associated with the subject site and adjoining lands;
- The likely and significant impacts of the proposed development on the environment; and,
- Available methods of reducing or eliminating undesirable impacts.

A series of meetings have taken place with the technical staff of Dublin City Council and a consultation meeting has taken place between the Applicant, the Planning Authority and An Bord Pleanála under the strategic housing development (SHD) process which assisted in the preparation of this EIAR and planning application.

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

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

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

Annex IV states:-

"1. A Description of the project, including in particular:
(a) a description of the location of the project;
(a) (b) a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
(b) (c) a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;
(c) (d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases.
2. A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.
3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.
4. A description of the factors specified in Article 3(1) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.
5. A description of the likely significant effects of the project on the environment resulting from, inter alia:
(a) the construction and existence of the project, including, where relevant, demolition works;
(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);
(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;
(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;
(g) the technologies and the substances used.
The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium- term and long-term,

permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project.
6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.
7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.
8. A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.
9. A non-technical summary of the information provided under points 1 to 8.
10. A reference list detailing the sources used for the descriptions and assessments included in the report."

1.7 PURPOSE OF THE EIAR

The objective of the EIAR is to identify and predict the likely environmental impacts of the proposed development; to describe the means and extent by which they can be reduced or ameliorated; to interpret and communicate information about the likely impacts; and to provide an input into the decision making and planning process. As provided for in the EPA guidelines, the EIAR focuses on:

- *Impacts that are both likely and significant;*
- *Impact descriptions that are accurate and credible'*

The objective of the EIAR will be to identify and predict the likely environmental impacts of the proposed development; to describe the means and extent by which they can be reduced or ameliorated; to interpret and communicate information about the likely impacts; and to provide an input into the decision making and planning process.

The definition of Environmental Impact Assessment is clarified within the 2014 EIA Directive and is as follows:

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

Under Article 5(3) of the 2014 Directive, it is expressly required that the developer must ensure that the environmental impact assessment report (EIAR) is prepared by competent experts. Each of the chapters of this EIAR for the subject development have been prepared by experts with the requisite qualifications and competences.

The intention of this EIAR document is to provide transparent, objective and replicable documentary evidence of the EIA evaluation and decision-making processes which led to the selection of the final project configuration. The EIAR documents the consideration of environmental effects that influenced the evaluation of alternatives. It also documents how the selected project design incorporates mitigation measures; including impact avoidance, reduction or amelioration; to explain how significant adverse effects will be avoided.

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

1.8 OBJECTIVES OF THIS EIAR

The EPA guidelines list the following fundamental principles to be followed when preparing an EIAR;

- Anticipating, avoiding and reducing significant effects
- Assessing and mitigating effects
- Maintaining objectivity
- Ensuring clarity and quality
- Providing relevant information to decision makers
- Facilitating better consultation.

This EIAR document describes the outcomes of the iterative EIA process which was progressed in parallel with the project design process. This forms the first part of the EIA process which will be completed by the competent authority, which in turn will be required to examine, analyse and evaluate the direct and indirect effects of the development on the various factors listed under Section 171A of the Planning and Development Act 2000, as amended.

The amended EIA Directive prescribes a range of environmental factors which are used to organise descriptions of the environment and the environmental impact assessment should identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the prescribed environmental factors which are:

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

This EIAR documents the assessment process of the prescribed environmental factors in relation to the proposed SHD residential development at Concorde Industrial Estate.

The EIA process was based on the following four key objectives:

- Pursuing Preventative Action;
- Maintaining Environmental Focus and Scope;
- Informing the Decision; and

- Public & Stakeholder Participation

1.8.1 Pursuing Preventative Action

Pursuing preventative action is the most effective means by which potential negative environmental impacts can be avoided. An assessment of anticipated likely and significant impacts was undertaken during the screening, informal scoping and the considerations of alternatives stages of the EIA process. This involved forming a preliminary opinion, in the absence of complete data, with respect to the approximate magnitude and character of the likely environmental impacts. This assessment was based on the knowledge, experience and expertise of the EIA and project design team with reference to the amended EIA Directive, EIA guidance material and local precedents.

Avoidance of impacts has been principally achieved through the consideration of alternatives and through the review of the project design in light of identified key environmental constraints. This is outlined in greater detail in Chapter 2.

1.8.2 Maintain Environmental Scope and Focus

It is important that the EIAR document remains tightly focussed. This minimises expenses, delays and the potential for a confusing mass of data to obscure relevant facts. The EIA process has been project-managed and steered, so as to ensure that the EIAR documentation and analysis are confined to those topics and issues which are explicitly described in the legislation, and where environmental impacts may arise. Evaluation and analysis has been limited to topics where the indirect, secondary or cumulative impacts are either wholly or dominantly due to the project or development under consideration and remain focused on issues that:

- Are environmentally based;
- Are likely to occur; and,
- Have significant and adverse effects.

1.8.3 Informing the Decision

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

1.8.4 Public & Stakeholder Participation

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

Public participation and consultation is an integral part of the new Strategic Housing Development process as outlined in the Planning and Development (Housing) and Residential Tenancies Act 2016 and the Planning and Development (Strategic Housing Development) Regulations 2017.

The structure, presentation and the non-technical summary of the EIAR document, as well as the arrangements for public access, all facilitate the dissemination of the information contained in the EIAR. The core objective is to ensure that the public and local community are aware of the likely environmental impacts of projects prior to the granting of consent.

Informal scoping of potential environmental impacts was undertaken with the Planning Authority through pre-application meetings. Direct and formal public participation in the EIA process will be through the statutory planning application process under the new Strategic Housing Development procedures.

1.9 FORMAT AND STRUCTURE OF THIS EIAR

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

The structure used in this EIAR document is a **Grouped Format** structure. This structure examines each environmental topic[3] in a separate chapter of this EIAR document. The structure of the EIAR document is set out in Table 1.2 below.

TABLE 1.2: STRUCTURE OF THIS EIAR

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

[3] In some instances similar environmental topics are grouped.

TABLE 1.2: STRUCTURE OF THIS EIAR

Chapter	Title	Content
9	Air Quality and Climate	Provides an overview of the baseline air quality and climatic environment, the potential impact of the proposed development, the vulnerability of the project to climate change, and recommends mitigation measures.
10	Noise and Vibration	Provides an overview of the baseline noise environment, the potential impact of the proposed development and recommends mitigation measures.
11	Material Assets – Traffic and Transport	Describes the existing services and infrastructural service requirements of the proposed development and the likely impact of the proposed development on material assets.
12	Material Assets – Waste	Describes the existing services and infrastructural service requirements of the proposed development and the likely impact of the proposed development on material assets.
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 material assets.
14	Interactions of the Foregoing	Describes the potential interactions and interrelationships between the various environmental factors
15	Risk	Describes the risk associated with the development through construction and operation and the management of these risks
16	Summary of Mitigation and Monitoring Measures	Sets out the key mitigation and monitoring measures included in the EIAR Document for ease of reference.

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

TABLE 1.3: METHODOLOGY EMPLOYED TO EVALUATE EACH ENVIRONMENTAL TOPIC

- **Introduction:** Provides an overview of the specialist area and specifies the specialist who prepared the assessment.
- **Study Methodology:** This subsection outlines the method by which the relevant impact assessment has been conducted within that chapter.
- **The Existing Receiving Environment (Baseline Situation):** In describing the receiving environment, the **context, character, significance and sensitivity** of the baseline receiving environment into which the proposed development will fit is assessed. This also takes account of any proposed developments that are likely to proceed.
- **Characteristics of the Proposed Development:** Consideration of the 'Characteristics of the Proposed Development' allows for a projection of the 'level of impact' on any particular aspect of the proposed environment that could arise. For each chapter those characteristics of the proposed development which are relevant to the area of study are described; for example the chapter on landscape and visual impact addresses issues such as height and impact on the surrounding landscape.

- The characteristics of projects must be considered, with particular regard to: (a) the size and design of the whole project; (b) cumulation with other existing and/or approved projects; (c) the use of natural resources, in particular land, soil, water and biodiversity; (d) the production of waste; (e) pollution and nuisances; (f) the risk of major accidents and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge; (g) the risks to human health (for example due to water contamination or air pollution).

- **Potential Impact of the Proposed Development:** This section provides a description of the specific, direct and indirect impacts that the proposed development may have. This is provided with reference to both the Receiving Environment and Characteristics of the Proposed Development sections while also referring to the (i) magnitude and intensity, (ii) integrity, (iii) duration and (iv) probability of impacts. Impact assessment addresses direct, indirect, secondary, cumulative, transboundary, short, medium and long-term, permanent, temporary, positive and negative effects as well as impact interactions.

- **Do Nothing Impact:** In order to provide a qualitative and equitable assessment of the proposed development, this section considers the proposed development in the context of the likely impacts upon the receiving environment should the proposed development not take place.

- **Avoidance, Remedial and Mitigation Measures: Avoidance,** remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential impacts. This includes avoidance, reduction and remedy measures as set out in Section 4.7 of the Development Management Guidelines 2007 to reduce or eliminate any significant adverse impacts identified.

- **Predicted Impacts of the Proposed Development:** This section allows for a qualitative description of the resultant specific direct, indirect, secondary, cumulative, transboundary, short, medium and long-term, permanent, temporary, positive and negative effects as well as impact interactions which the proposed development may have, assuming all mitigation measures are fully and successfully applied.

- **Monitoring:** This involves a description of monitoring in a post-development phase, if required. This section addresses the effects that require monitoring, along with the methods and the agencies that are responsible for such monitoring.

- **Reinstatement:** While not applicable to every aspect of the environment considered within the EIAR, certain measures need to be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact to the environment.

- **Interactions:** This section provides a description of impact interactions together with potential indirect, secondary and cumulative impacts

- **Difficulties Encountered in Compiling:** This section provides and indication of any difficulties encounters by the environmental specialist in compiling the required information.

1.10 EIA PROJECT TEAM

1.10.1 EIA Project Management

This EIA was project managed, co-ordinated and produced by John Spain Associates. 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 EIAR 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.

1.10.2 EIA Environmental Specialists

Environmental specialist consultants were also commissioned for the various technical chapters of the EIAR 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 of the amended directive and in line with emerging best practice the EIAR states the names of the environmental consultants who have prepared each element of the EIAR and lists their qualifications and relevant experience; demonstrating that the EIAR 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 EIAR and their inputs are set out in Table 1.4 below.

TABLE 1.4: EIAR SPECIALIST CONSULTANTS

Organisation	EIAR Specialist Topics / Inputs
John Spain Associates, Planning & Development Consultants, 39 Fitzwilliam Place, Dublin 2, D02 ND61 T: 01 662 5803 E:mmacmahon@johnspainassociates.com Mary MacMahon MSc TCP Pg Dip MSP Pg Dip Env Eng Dip Env Plg Law Dip Mgmt Dip EIA & SEA B Soc Sc MIPI	• Introduction and Methodology • Project Description and Alternatives Examined • Population and Human Health • Material Assets • Interactions of the Foregoing • Principle Mitigation and Monitoring Measures • Non-Technical Summary
Cronin Sutton Consulting Engineers 19-22 Dame Street, Dublin 2	• Material Assets

TABLE 1.4: EIAR SPECIALIST CONSULTANTS

Organisation	EIAR Specialist Topics / Inputs
Axis Engineering 47 Mount street Upper, Dublin 2 T: 01 548 0863 E: aodoherty@axiseng.ie gordon.finn@csconsulting.ie robert.fitzmaurice@csconsulting.ie Gordon Finn, BA, BAI, MAI, MIEI, Robert Fitzmaurice Aaron O Doherty, B.Eng(hons), MIRI, MCIBSE	• Traffic and Transport Assessment and MMP (included as separate standalone reports) • Site Specific Flood Risk Assessment
RSK Environmental **Bluebell Business Centre, Old Naas Road, Inchicore, Dublin 12** **T: 01 244 4511** **E: PFeely@rskgroup.ie** Kimberly Porter Hannigan (BSc) Paul Feely, (BSc, MSc, FGS)	• Land and Soil • Water
Openfield Ecological Services 12 Maple Avenue, Carpenterstown, Dublin 15, D15 YX7V T: 01 823 6145 E: padraic@openfield.ie Padraic Fogarty – MSc Ecological Impact Assessment (EcIA) MIEMA	• Biodiversity • Appropriate Assessment Screening Report (included as separate standalone document)
AWN Consulting The Tecpro Building Clonshaugh Business and Technology Park Dublin 17 T: 01 847 4220 E: Stephen.Smyth@awnconsulting.com Dr Stephen Smyth BA BAI MIEI MIOA,	• Air Quality and Climate • Noise and Vibration • Operational Waste and Environmental Management Plan (included as separate standalone document)

TABLE 1.4: EIAR SPECIALIST CONSULTANTS	
Organisation	**EIAR Specialist Topics / Inputs**
Courtney Deery Archaeology, Lynwood House Ballinteer Road, Dublin 16 T: 01 547 5795 E: clare@courtneydeery.ie Dr. Yolande O' Brien PhD in Archaeology (National University of Ireland, Galway), MA in Landscape Archaeology (National University of Ireland, Galway) and a BA in Archaeology and Classical Civilisation (National University of Ireland, Galway).	• Archaeology and Cultural Heritage
Kennett Consulting 1-2 Marino Mart, Fairview, Dublin 3 E: chris@kennettconsulting.com T: 01- Chris Kennett Director of Kennett Consulting Limited.	• Landscape and Visual Impact and Photomontages

1.11 NON-TECHNICAL SUMMARY

The EIA Directive requires that one of the objectives of the EIA process is to ensure that the public are fully aware of the environmental implications of any decisions.

The EPA guidelines note that the non-technical summary of the EIAR should facilitate the dissemination of the information contained in the EIAR and that the core objective is to ensure that the public is made as fully aware as possible of the likely environmental impacts of projects prior to a decision being made by the Competent Authority.

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

A Non-Technical Summary of the EIAR has therefore been prepared which summarises the key environmental impacts and is provided as a separately bound document.

1.12 LINKS BETWEEN EIA AND APPROPRIATE ASSESSMENT (AA)

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

In January 2010, the Department issued a guidance document entitled 'Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities'. This guidance document enshrines the 'Source-Pathway-Receptor' into the assessment of plans and projects which may have an impact on Natura 2000 sites. Accordingly, an **Appropriate Assessment Stage 1 Screening** exercise was undertaken by Altemar in accordance with *'Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites – Methodological Guidance on the Provisions of Article 6 (3) and (4) of the Habitats Directive 92/43/EEC)'.* In accordance with these Guidelines, the Appropriate Assessment may be a separate document or form part of the EIAR. In the case of the proposed development a separate Appropriate Assessment Screening Report is submitted with this application.

1.13 AVAILABILITY OF EIAR DOCUMENTS

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

1.14 IMPARTIALITY

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

It should be noted that, as highlighted above, an important part of the EIA process is preventative action which causes the project design team to devise measures to avoid, reduce or remedy significant adverse impacts in advance of applying for consent. As a result, where no likely significant impacts have been identified where they might reasonably be anticipated to occur, the design and layout of the proposed development has generally been amended to minimise the potential of any likely significant adverse impacts.

1.15 STATEMENT OF DIFFICULTIES ENCOUNTERED

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

1.16 QUOTATIONS

EIAR documents by their very nature contain statements about the proposed development, some of which are positive, and some negative. Selective quotation or quotations out of context can give a very misleading impression of the findings of this EIAR.

The EIAR study team urge that quotations should, where reasonably possible be taken from the conclusions of specialists' chapters or from the non-technical summary and not selectively.

1.17 EIAR QUALITY CONTROL & REVIEW

John Spain Associates is committed to consistently monitoring the quality of EIAR 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 DHPLG have recently published draft guidelines on Environmental Impact Assessment for Planning Authorities and the Board (published August 2018)[4], and the EPA have published draft guidelines on the information to be contained in an Environmental Impact Assessment Report[5] which have been consulted in the preparation of this EIAR.

1.18 ERRORS

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

[4] *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, 2018*
[5] *Guidelines on the Information to be contained in an Environmental Impact Assessment Report, Environmental Protection Agency, 2017*

Chapter 2:

Project Description & Alternatives Examined

2.0 PROJECT DESCRIPTION AND ALTERNATIVES EXAMINED

2.1 INTRODUCTION AND TERMS OF REFERENCE

This section of the EIAR has been prepared by John Spain Associates, Planning & Development Consultants, and provides a description of the proposed development and also explains the evolution of the scheme design through the reasonable alternatives examined. This chapter of the EIAR was prepared by Mary MacMahon MSc TCP Pg Dip MSP Pg Dip Env Eng Dip Env Plg Law Dip Mgmt Dip EIA & SEA B Soc Sc MIPI, Executive Director. The description of the proposed development is one of the two foundations upon which an EIAR is based (the other being the description of the existing environment described in this chapter and by each of the specialist consultants in the subsequent chapters). It is also a requirement of the EIA Directive (as amended) to present an outline of the main alternatives considered and a justification of the final proposed development.

A systematic approach in accordance with the Draft Guidelines on the Information to be Contained in EIARs (2017), Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018), and other EIA guidance documents was used to ensure all relevant aspects of the development are accurately and fully described. The objective is to provide a description of the proposed development in sufficient detail, which when taken together with the description of the existing environment provided, will allow an independent reader without acquired technical environmental knowledge, to understand the significant impacts likely to arise from the proposed development.

The description of the proposed development is set out in this chapter and the following chapters by each specialist consultant in terms of those environmental topics which will form the basis of the impact assessment process and the characteristics of the proposed development which could potentially affect population, human health, cultural heritage and archaeology, biodiversity, landscape, land and soil, water, air quality, climate, noise, vibration, wind and material assets and the interaction between the aforementioned factors. The EIA Directive also requires that the description of the site, design, size or scale of the development, considers all relevant phases of the existence of the project from its construction through to its existence and operation (and where applicable its restoration or decommissioning).

This EIAR document fully reflects the key environmental factors of the proposed development which were recognised from the scoping carried out by the design team and the level of detail required will vary considerably according to the sensitivity of the existing environment and the potential of the project for significant effects.

2.2 SITE LOCATION AND DESCRIPTION

The subject site comprises of brownfield lands and the North Lott's Pumping Station comprising of 1.26 ha. The pumping station will be retained and protected as part of the works. The proposed site and building layout has also been informed by the presence of the pumping station.

The subject site comprises of Block 2B and 2D as set out in the SDZ Planning Scheme.

Planning permission has been approved on the site under Reg. Red. DSDZ2896/18 and as amended by DSDZ4279/18 for 349 no. residential units and a 100 no. bedroom aparthotel development.

The western part of Block 2 which is outside the application boundary comprises of lands owned by CIE.

The site is bound to the north by Sheriff Street, to the south by Mayor Street, to the east by New Wapping Street and to the west by a new street.

The subject site is located in an emerging area for high density residential and commercial development with high quality public transport services. The location of the subject site is identified for re-generation as set out in

the North Lotts and Grand Canal Dock SDZ Planning Scheme and has the potential to provide for significant residential development in this part of the city.

Figure 2.1: Subject Site and Surroundings (Approximate Extent in Red)

2.3 PROJECT OVERVIEW

The proposed development seeks amendments to the previously permitted development permitted under Reg. Reg. DSDZ2896/18 and as amended by Reg. Ref. DSDZ4279/18. The proposed development comprises of the reconfiguration of the permitted residential scheme to provide for an additional 115 no. units increasing the total number of residential units from 349 to 464 no. The total breakdown of units will comprise of 229 no. 1 bed and 235 no. 2 bed units (18 2 bed three person and 217 2 bed 4 person) with ancillary residential amenity spaces. The proposed residential accommodation will also include the provision of 2 no. courtyard areas and roof terraces to serve the future residents. The proposed development will also provide for internal communal space.

The proposed development also includes the change of use of the permitted aparthotel to shared accommodation. The proposed shared accommodation will provide for 84no. units comprising of 2 no. studios (single occupancy), 46 no. studio units (double occupancy), and 36 no. 2 bedroom units. The proposed shared accommodation development also include the provision of ancillary communal space to serve the residents and a café unit at ground floor level. It is proposed to manage the shared accommodation development separate to the residential accommodation on the site. The proposed shared accommodation scheme will contain its own communal space and roof terrace to serve the residential units.

The residential development also will provide for an increase in the residential amenity space and communal space associated with the development, an increase in the cycle parking numbers. The proposed development also includes the provision of a link bridge to connect the new increased residential amenity areas in Block 1 and 2 at 6th floor level.

The proposed development is an amendment to an existing residential and aparthotel scheme and will provide for an increase in the number of much needed residential accommodation within a highly accessible location adjacent to the city centre.

A mix of 1 no. bedroom (229 no.) and 2 no. bedroom (235 no.) apartments will be provided in two blocks ranging in height from 3 no. storeys to 13 no. storeys. The proposed unit mix will reflect the nature of the surrounding

demographics and demand for these types of units. The unit mix is also reflective of the recently updated Sustainable Urban Housing, Design Standards for new Apartments, Guidelines for Planning Authorities 2018 which enables a greater proportion of 1 bed units in line with the emerging trends for household sizes.

The residential units have been designed to accord with the Dublin City Development Plan standards and the guidelines set out in Sustainable Urban Housing, Design Standards for new Apartments and Guidelines for Planning Authorities in terms of unit mix, size, private open space, room sizes etc.

The proposed residential units will provide for a range of ancillary facilities such as communal open space, internal communal spaces capable of facilitating a range of activities such as gym, cinema rooms, meeting rooms, function rooms etc. It should be noted that the communal internal room located in Block 2 will be available for the wider community on a rental basis if required.

The proposed change of use from aparthotel to shared accommodation scheme has also been designed in accordance with the Apartment Guidelines 2018. The proposed shared accommodation development will provide for more affordable accommodation to the young workforce in the area. The shared accommodation scheme will provide for an alternative type of living that will bridge the gap for the young workforce between student life and private rental apartments, providing for an interactive and integrated approach to rental accommodation.

The provision of this shared accommodation scheme within 1km from the city centre, within walking distance of transport hubs and a host of business destinations is considered to significantly enhance the overall level of residential accommodation within the city. The location adjacent to major new businesses such as Salesforce in the adjoining City Block and major firms such as Goggle and Facebook within the Grand Canal area, will provide for easy accessible accommodation to cater for this workforce through a variety of lease terms.

The proposed development also includes a range ancillary items such as landscaping and engineering works which are detailed within this section of the report.

The application is accompanied by a Design Statement and drawings prepared by HJL Architects, which provide a rationale for the design and layout of the proposed scheme, the dwelling types and commercial units.

Also included as part of this application is a Landscape Design Report which was prepared by NMP Landscape Architects, and which provides a rationale for the landscape proposals within the development including proposals relating to pedestrian movement through the site. The landscape design response to the site has been calculated so as to provide a large quantity of high quality amenity space for residents of the area. The subject site is currently under construction as permitted under DSDZ 2896/18 as amended by DSDZ4279/18 for 349 no. units and an aparthotel of 102 no. units. The development on the site is currently progressing at a fast pace with the core constructed up to 3rd floor level and the overall floor plates up to 1st floor level. By the end of the year the development structure will be up to the 6th floor level on the site.

The extent of construction works on the site emphasises the fact that the applicant is willing and currently moving with delivering over 300 homes to the City Centre. This application seeks to increase the number of units to 464 no. and 200 no. shared accommodation bed spaces and it is considered unsustainable to restrict the development of these much needed homes to the city centre, 10% of which, or 46, will be available to DCC as social and affordable housing. It is respectfully requested that An Bord Pleanála acknowledge the overall importance of delivering this much needed housing stock and consider the current construction progress on site in their assessment.

2.4 STATUTORY PLANNING CONTEXT

The subject lands are subject to national, regional, sub-regional, county and local planning policy. The following outlines the key planning documents of relevance to the future development of the subject lands. This section will not address the detailed policies and objectives contained in the various plans which are relevant to the proposed residential and commercial development at Spencer Dock, Block 2, as these are addressed in a separately bound Planning Report and Statement of Consistency prepared by John Spain Associates which accompanies the planning application.

National

- National Planning Framework - Project Ireland 2040;
- Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (2009);
- The Urban Design Manual (A Best Practice Guide) (2009);
- Delivering Homes, Sustaining Communities (2008) and the accompanying Best Practice Guidelines - Quality Housing for Sustainable Communities;
- Quality Housing for Sustainable Communities (2007);
- Sustainable Urban Housing: Design Standards for New Apartments (2018)
- Design Manual for Urban Roads and Streets (2013);
- Smarter Travel: A Sustainable Transport Future - A New Transport Policy for Ireland (2009).
- The Planning System and Flood Risk Management – Guidelines for Local Authorities (2009).

Regional

- Eastern and Midland Regional Assembly - Regional Spatial & Economic Strategy (RSES): Draft October 2018
- Regional Planning Guidelines for the Greater Dublin Area (2010 – 2022);

Local

- Dublin City Development Plan 2016-2022.
- North Lotts and Grand Canal Dock SDZ Planning Scheme

The Dublin City Development Plan 2016-2022 sets out the planning policy context for future development in city up to 2022. It details land use and development objectives, settlement hierarchy, development control standards and policies and objectives for the protection of the built and natural environment of the City. It is the most relevant document pertaining to the future development of the subject lands, together with the North Lotts and grand Canal Dock SDZ Planning Scheme.

The site is zoned Z14 with the objective *"to seek the social, economic and physical development and/or rejuvenation of an area with mixed use of which residential and "Z6" would be the predominant uses".*

2.5 ALTERNATIVES EXAMINED

2.5.1 INTRODUCTION

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*."

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 an outline of the main

alternatives examined throughout the design and consultation process. This serves to indicate the main reasons for choosing the development proposed, taking into account and providing a comparison the environmental effects. For the purposes of the Regulations, 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."

Pursuant to Section 3.4.1 of the Draft 2017 EPA Guidelines, the consideration of alternatives also needs to be cognisant of the fact that "*in some instances some of the alternatives described below will not be applicable – e.g. there may be no relevant 'alternative location'…"*

The Draft 2017 EPA Guidelines are also instructive in stating:

"Analysis of high-level or sectoral strategic alternatives cannot reasonably 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 key environmental and practical considerations which influenced the design of the proposed development and alternative layouts on the subject lands included the following:

- The need to achieve a density exceeding 50 units per hectare to comply with the requirements of the guidelines for Sustainable Residential Development in Urban Areas and the policies of the Dublin City Development Plan, given the location of the subject site adjacent to a Luas stop.
- The need to consider the interaction of the development with the surrounding key development sites and specific requirements of the North Lotts and Grand Canal Dock Planning Scheme.
- The need to ensure any residential development provides an appropriate mix of housing types which meet current market demand and which are deliverable in the short to medium term.
- The need to consider the interaction of the access arrangements for the development with the Luas line adjacent to the site.
- The need to consider the constraints of the Irish Water Pumping Station on the site.
- The quality of the urban environment to be delivered and the associated impact on human health.
- Access, permeability and connectivity with surrounding areas and land uses.

The following analyses alternative development options for the site, describing design options and changes which were incorporated into the scheme as the proposals progressed through extensive and detailed pre-application discussions with the Planning Authority. The key considerations and amendments to the design of the scheme, having regard to and comparing the key environmental issues, are set out and discussed.

The subject scheme is for the construction of residential units with associated open space and road and service infrastructure, on brown field lands which are zoned for mixed use development. Having regard to the above it was not considered necessary to consider alternative sites for the proposed development.

A 'do-nothing' scenario was considered to result in the construction of the extant permission on the site for 349 no. residential units and an aparthotel of 100 no. units permitted under Reg. Ref. DSDZ 2896/18 and Reg. Ref. DSDZ4279/18.

The suitability of the lands for development, i.e. located within an established development area of the City and adjacent to high frequency public transport and good quality road infrastructure, were also key considerations.

2.5.2 Description of Alternative Locations

As outlined above, the subject site is primarily zoned for residential and commercial use under the City Development Plan 2016-2022 and is located within the North Lotts and Grand Canal Dock SDZ area. As such consideration of alternative sites for the construction of residential use proposed in this proposal was not considered necessary. The project is site specific.

During the design process for the proposed development several iterations of the site layout and alternative designs were considered. The final planning application demonstrates that the subject site and the surrounding area have the environmental capacity to accommodate the proposed development without any significant risk of impact upon environmental sensitivities due to the sites location.

2.5.3 Description of Alternative Designs

This section provides an overview of how the proposed development has evolved to date by way of consideration of alternative designs and how the final Strategic Housing Development scheme before the Board has been reached. Various options were considered as the scheme progressed and key considerations and amendments to the design were incorporated, having regard to the key environmental issues pertaining to the lands.

The environmental issues which have most informed the design process to date relate to visual impact, ecology, water, noise, and the potential impacts upon existing and future traffic and transport in the area. These issues have informed the consideration of alternative designs, layouts, and access arrangements up to the formalisation of the scheme submitted in this final application to the Board.

Alternative 1: Permitted Development Reg. Ref. DSDZ2896/18

Figure 2.2 Permitted Residential development June 2018

In June 2018 a planning application was granted (DSDZ2896/18)for the construction of an Henry J Lyons-designed development comprising 325 no. residential units and an aparthotel in 2 no. blocks. Block 1 to the north of the site will be 7 no. storeys in height and will comprise of 211 no. units in total. Block 1 will also include the provision of a communal open space courtyard, reception/concierge, back of house area and internal communal space associated with the residential development at ground floor level, and communal amenity space at 6th floor level. Block 2 to the south of the site will be part 6 no. / part 7 no. storeys and will comprise of 114 no. units in total and shared accommodation scheme to the western portion of the block comprising of 120 no. bedrooms, (200 no. bedspaces)

The visual representation of this scheme did not provide for appropriate articulation and modulations within the development. The overall massing of the development was dense and the design was perceived as monolithic in nature.

Alternative 2: Permitted Development DSDZ4279/18

Figure 2.3: Permitted Residential Development December 2018

In December 2018 a planning application was granted (DSDZ4279/18) for proposed amendments to previously permitted development DSDZ2896/18 comprising of the internal re-configuration of the previously consented Block 1 and Block 2 to provide for 349 no. residential units, increasing the consented total from 322 no. 349 no. units. Block 1 will comprise of 222 no. units, and Block 2 will comprise of 127 no. units. The revised block layout will result in amendments to all elevations including revised location and provision of private balconies / terraces and revised resident amenity facilities. Revised aparthotel layout to provide for 100 no. units (240 no. bed spaces).

The design of this application sought to address the overall visual impact of the development by introducing elevations changes to provide an element of variety and interest into the elevations. Given the height constraints of the Planning Scheme, the extend of modulation and articulation in terms of height, scale and massing to break up the development was limited.

Alternative 3: Refused Development DSDZ2241/19

Figure 2.4- Refused Development

In May 2019, planning permission was refused for amendments to the previously permitted development DSDZ 2896/18 as amended by DSDZ4279/18 to provide for 471 no. residential units and an aparthotel of 127 no. units. The proposed development sought an increase in height from the permitted buildings on site to provide for increased densities at this strategic location well served by public transport.

The increase in height added variation to the elevations and visual interest in the building form. The proposed height enabled the design of the building to be enhanced and articulated to address the urban design of the area more appropriately.

Permission was refused by the City Council due to the provision of additional floors being inconsistent with the maximum heights permitted in the planning scheme. The City Council also stated that the design of the additional floors flailed to articulate individual elements and the overall scale, bulk and massing of the structures would present an unduly monolithic building façade.

Final Overall Proposed Development Scheme

Figure 2.5 Final proposed development

The proposed design, scale, massing and height of the proposed scheme was reconsidered following the pre application meeting with An Bord Pleanála and the comments received from the planning authority.

The main concern related to the scale and mass of the proposed development in the context of the surrounding properties and in the context of the overall visual monolithic perception of the development

As part of the revised design, the elevational treatment of the development has been carefully broken up and articulated into a number of vertical columns of varying materials and finishes. The proposed use of materials and finishes significantly enhance the visual interest and amenity of the building. The use of materials and articulation to the building façade provide an interesting design solution.

The proposed heights and treatment of the corner features of the development provide for good urban design principles, identifying the landmark features to the area and creating a sense of place and arrival.

The proposed height of the development is also considered to integrate well into the overall context of development, providing for an interesting skyline and differentiation between blocks. It is considered that the final design as proposed is an appropriate solution in response to the earlier, more monolithic developments on the site.

2.5.4 Environmental Considerations arising from the Alternative Projects

Table 2.1 Environmental impacts of the alternative projects

Application	DSDZ2896/18 (Option 1)	DSDZ4279/18 (Option 2)	DSDZ2241/19 (Option 3)	Proposed Development	Environmental impact	Assessment
Projects	Residential and Aparthotel	Residential and Aparthotel	Residential and Aparthotel	Residential and Shared Accommodation	Option 1, 2, and 3 all provide for a mix of residential and commercial development. The proposed option provides for a full residential scheme increasing the number of units on the site and providing for increased residential amenity	The change of use from aparthotel to shared accommodation provides for a positive impact in terms of human health increasing the number of available residential units in the area and providing for increased and enhanced residential amenity.
GFA	38,531 sq.m. 32,920 sq.m. residential 5,611 sq.m. commercial (aparthotel)	40,470 sq.m. 34,376 sq.m. residential 6,094 sq.m. commercial (aparthotel)	52,024 sq.m. 45,097 sq.m. residential 6,927 sq.m. shared accommodation	53,173 sq.m. 45,738 sq.m. residential 7,435 sq.m. shared accommodation	Option 1, 2, and 3, all provide for a commercial aspect of development on the site. The proposed development seeks to change the use of the aparthotel to shared accommodation, thereby increasing the level of residential development on the site.	The proposed development considered more sustainable use of the site
Communal Space	Combination of internal and external spaces provided	Combination of internal and external spaces provided	Combination of internal and external spaces provided	Increase level of internal amenity space provided.	Quality of life for future residents increased by providing more communal space	The proposed option provides for a higher proportion of internal amenity space between the residential and shared

						accommodation and is therefore considered to improve the quality of the development and increase the benefit to the public realm
Materials	Brick and glazing	Brick and glazing	Brick, glazing and metal cladding,	Brick, glazing, metal cladding, and bespoke metal framing of balconies and windows	Increased variation in materials provide for greater visual interest	The proposed materials provide for an increase in the variation of the elevational treatment and improves the visual interest and character of the area
Car Parking	77 spaces	80 spaces	78 spaces	78 spaces	Options, 1, 2and 3, all provide for greater car parking numbers which is not in accordance with sustainable development practise	The proposed development will reduce the number of car parking spaces in a sustainable manner based on the proximity of public transport services and more sustainable modes of transport
Cycle spaces	462 spaces	524 spaces	726 spaces	828 spaces	Options 1, 2 and 3, all provide for less cycle parking spaces than proposed	The proposed development provides the most sustainable options for transport – walking and cycling by increasing the number of cycle spaces provided.
Plot ratio	1:3	1:3.2	1:4.1	1:4.2		The proposed development is the most

						efficient use of land

Overall, the proposed development proves better from an environmental perspective. The proposed development provides for a greater number of residential units in a highly accessible location, increasing the number of cycle activities and encouraging sustainable use of public transport services. The proposed use of materials provides for greater visual interest into the streetscape and skyscape. The proposed development provides for increased residential accommodation that is not limited aparthotel residents, fulfilling a much-needed housing role. Due to the proximity to large employment zones, future residents can walk or cycle to their workplace. The proposed development is therefore considered the most beneficial from an environmental perspective.

2.5.5 Description of Alternative Processes

The EIA Guidelines state that within each design solution there can be a number of different options as to how the processes or activities of the development can be carried out. These can include management of emissions, residues, traffic and the use of natural resources.

A key consideration in the various options which were considered, as discussed above, was the uses proposed within the development and the appropriate proportion of these uses within the site. A key consideration of this was the presence of the Irish Water pumping station on the site. In this regard the proposed development has undergone a number of design iterations to provide for the most appropriate treatment to this infrastructure on the site.

2.6 CHARACTERISTICS OF THE PROJECT

The final proposed development consists in brief of the following, as set out within the public notices:

Spencer Place Development Company Limited intend to apply for planning permission for alterations to a previously permitted development to provide for a Residential and Shared Accommodation Scheme on lands (c. 1.26 ha) located at City Block 2, Spencer Dock, Dublin 1. The site is bound by Sheriff Street Upper to the north, Mayor Street Upper to the south, New Wapping Street to the east and a development site to the west (also part of Block 2). The subject site also includes the existing operational North Lotts Pumping Station and its associated infrastructure.

The proposed alterations are sought under Section 3(d) of the Planning and Development and Residential Tenancies Act 2016 as amended by the Planning and Development (Amendment) Act 2018 for alterations to previously permitted development , Reg. Ref. DSDZ2896/18 and as amended by DSDZ4279/18 to increase the total number of residential units from 349 units to 464 units and a change of use from permitted aparthotel to shared accommodation comprising of 200 no. bedspaces (120 bedrooms) including associated revisions to elevations and floor plans.

The application relates to a proposed development within a Strategic Development Zone Planning Scheme area (North Lotts and Grand Canal Dock SDZ).

The proposed development will consist of the following:

- *Redesign of the permitted residential and aparthotel development to provide for 464 no. residential units and 200 no. shared accommodation bedspaces across a total of 120 no. bedrooms in two buildings, Block 1 (residential to the north) and Block 2 (shared accommodation and residential to the south).*
- *The residential development will comprise of 229 no. 1 bed units and 235 no. 2 bed units resulting in a total of 141 no. 1 bed and 157 no. 2 bed units in Block 1 and 88 no. 1 bed and 78 no. 2 bed units in Block 2.*
- *Block 2 will also comprise of 200 no. shared accommodation bedspaces across a total of 120 no. bedrooms*
- *The proposed height of the development will range from 3 no. storeys and 13 no. storeys. Block 1 will increase in height from the permitted development of max 7 no. storeys (27.5 m) to a maximum height of 13 no. storeys (47m). Block 2 will increase in height from a max 7 no. storeys (27.5m) to max 11 no. storeys (40.5m)*
- *The proposed alterations will result in revisions to all elevations including revised location and provision of private balconies / terraces and the provision of set back levels;*
- *Provision of link bridge at 7th storey (6th Floor) connecting Block 1 and Block 2;*
- *Revised location and increase in internal residential amenity space associated with the development and the provision of external communal roof terraces to serve the residential units;*
- *Provision of internal communal amenity space and roof terraces in the shared accommodation scheme;*
- *Provision of café unit in Block 2 fronting Mayor Street;*
- *Revised under croft layout and increase in area to include 78 no. car parking spaces and 726 no. cycle parking spaces; and an increase in plant area;*
- *Revised landscaping throughout the scheme and revised boundary treatments along the street frontages;*
- *Omission of the southern element of Block 1 above the Irish Water pumping station and revised landscaping treatment to screen the pumping station structure.*
- *Provision of 102 no. surface level visitor bicycle parking spaces;*
- *Revisions to plant at roof level;*
- *The development also includes, SUDs drainage, the provision of a green roof on both blocks, consequential amendments to all elevations and all associated site development works necessary to facilitate the development.*

An Environmental Impact Assessment Report has been prepared in respect of the proposed development.

The proposed shared accommodation is in accordance with Specific Planning Policy 9 as set out in the "Sustainable Urban House: Design Standards for New Apartments 2018".

The subject site is zoned Z14 in the Dublin City Development Plan 2016-2022.

The application contains a statement setting out how the proposal will be consistent with the objectives of the Dublin City Council Development Plan 2016-2022 and the North Lotts and Grand Canal Dock SDZ Planning Scheme 2014.

The application contains a statement indicating why permission should be granted for the proposed development, having regard to a consideration specified in section 37(2)(b) of the Planning and Development Act, 2000, as amended, notwithstanding that the proposed development materially contravenes a relevant development plan or local area plan other than in relation to the zoning of the land.

The application together with an Environmental Impact Assessment Report may be inspected, or purchased at a fee not exceeding the reasonable cost of making a copy, during public opening hours at the offices of An Bord Pleanála and Dublin City Council. The application and Environmental Impact Assessment Report may also be inspected online at the following website set up by the applicant: www.spencernorthshd.ie

The SHD application to An Bord Pleanála is accompanied by detailed drawings and a detailed design statement, prepared by HJL Architects, which provides a rationale for the design of the proposed scheme. Additional justification is provided within the statements of response prepared by the design team, to provide a comprehensive response in accordance with the opinion of the Board on the pre-application consultation for the proposed development. The Statement of Response prepared by John Spain Associates provides a summary of the overall response provided to the issues raised by the Board, and by the Planning Authority during the course of the SHD pre-application consultation process, and refers the reader to the relevant documentation within the planning application pack.

Density

The proposed density on the subject site is 384 no. units per hectare. It is considered that the proposed density is appropriate given the National Policy objective to increase residential density in existing urban infill locations.

Land Use Mix

The proposed development provides for a mix of 484 no. residential apartment units and 84 no. shared accommodation units comprising of 200 no. bed spaces.

The land use mix proposed is in accordance with the North Lotts and Grand Canal Dock Planning Scheme and the Joint City Block Roll Out Agreement which is submitted with this application.

Landscape Proposals

The proposed development includes significant areas of public space and communal residential amenity space. The proposed landscaping also include a numbers of pedestrian and cycle linkages through the site and the provision of a new east west street for both biodiversity and the movement through the site. the landscape plans also include children's play area and a number of passive recreational spaces.

The landscape design also includes significant improvements to the public realm areas surrounding the development along the site boundaries.

Access

The site is accessible from all site boundaries. The principle vehicular access will be off New Wapping Street with pedestrian access off Mayor Street, Sherriff Street and New Wapping Street. Access will also be provided through the new north south street to the west of the site and through the new east west street that transverses

A mobility management plan and traffic impact assessment is submitted as part of this application.

2.7 THE EXISTENCE OF THE PROJECT

2.7.1 Introduction

The purpose of this section is to provide a description of the proposed development and consider all relevant aspects of the project life cycle both during construction and post construction (and decommissioning if applicable). These include the following:

- Construction Stage (Land Use Requirements, Construction Activity & Significant Effects).
- Operation Stage (Processes, Activities, Materials Used).
- Changes to the Project.
- Secondary and Off-Site Developments.

2.7.2 Description of Construction Stage

This section of the EIAR summarises the construction and phasing of the proposed development and summarises the measures to be taken to ensure that the impact of construction activity is minimised. The Construction Management Plan and Construction and Operational Waste Management Plan, which are included as standalone reports with this application, should be referred to for a more detailed assessment of the construction, waste and indicative phasing proposals for this development.

- Construction Stage

As noted in above the construction of this development is likely to take place in a single phase of development as described below:

- Phase 1 – Delivery of the residential development over an estimated 15 month period.

The sequence of construction outlined above is submitted in the Construction Management Plan submitted with this application. As the works are ongoing on the site the construction management plan has taken account of the ongoing practices on the site.

- Construction Activities

There are a number of construction activities involved in a project such as this. The activities (independent of phasing) can be divided into five general categories:

- Excavation
  This includes site clearing and earthworks – soil / rock removal – required to prepare the site for the foundations, the basement and residential floorspace above. This element of the development has already taken place on the site under the permitted scheme on the site.
- Structure
  Structure includes the foundations and the physical frame of the residential units. Part of the structural frame has commenced on the site. There is no change to the general layout of the development on the

site in comparison to the existing permission. The main item affected is the removal of the southern elevation to Block 2 over the pumping station. This however will not effect the overall structural frame on the building. It is envisaged that the proposed development will retain the same structural frame as permitted on the site.

- Enclosures
  The enclosures for the building will be formed from brick, block work, timber, and glass, with concrete roofs, all with the required levels of insulation and water proof membranes.
- Facades
  The facades will comprise of selected brick finish with glazed elements and bespoke metal detailing and cladding
- Services
  The requisite services will be provided including drainage and lightning.
- Landscaping
  The landscaping works include some hard landscaping, roads, footpaths, cycle-paths, bed and tree planting, and open courtyard areas.

Geotechnical Investigation

The ground conditions are described in further detail in the Land and Soils Chapter of the EIAR.

Predicted Impact of the Construction Stage

There are a number of aspects that will be impacted upon due to the construction of this development. This list is non-exhaustive but covers the major issues to be considered in the assessment of possible impacts of the development:

- Construction methods – duration and phasing.
- Construction traffic, parking and site working hours (see standalone TTA).
- Health and Safety issues.
- Noise & Vibration due to construction work.
- Air quality (principally dust)
- Construction waste management (see separate standalone report)

Construction Methods – Phasing of development

The construction methodology that will be utilised on the site will have three main attributes to minimise the impact of the construction phase.

- Phasing of construction
- Efficiency
- Minimisation of waste generated

Construction methods will use techniques that afford safe, efficient, and cost-effective methods of working. In order to minimise the traffic impact associated with the removal of material from the site and the construction phase in general, the Contractor will prepare and implement a Construction Traffic Management Plan.

Construction Traffic, Parking and Site Working Hours

The Construction Management Plan and TTA address these issues in greater detail. It advises that the works associated with the new development will develop additional traffic on the public road network associated with the removal of excavated material etc. and the delivery of new materials, concrete trucks etc.

The vehicles associated with the construction activities are as follows:

- Excavators;
- Dump trucks;
- Concrete delivery trucks;
- Concrete pumps;
- Mobile cranes; and
- Mobile hoists.

It is proposed that standard construction working hours will apply.

It will be necessary for the appointed contractor to prepare a detailed construction traffic management plan to ensure the smooth operation of the local road network during the course of the construction project. It will be necessary to agree this construction traffic plan with Dublin City Council in advance of the project and that the construction traffic plan management is reviewed throughout the project.

Health & Safety Issues

The development will comply with all Health & Safety Regulations during the construction of the project. Where possible potential risks will be omitted from the design so that the impact on the construction phase will be reduced.

Noise & Vibration due to Construction Work

The potential impacts associated with noise and vibration due to construction work, are addressed in Chapter 10 Noise & Vibration.

Air Quality

The potential impacts associated with air quality due to construction work are addressed in Chapter 9Air Quality and Climate.

Construction Waste Management

A standalone Construction & Operational Phase Waste Management Plan for the proposed development is included with this application. The purpose of this report is to ensure the best practice is followed in terms of waste and environmental management during the construction phase of the proposed development, and to ensure adverse impacts on the receiving environment – including local residents - are minimised.

2.7.3 Description of the Operation Stage of the Project

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

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

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

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

2.7.4 Description of Changes to the Project

Draft Guidelines on the information to be contained in environmental impact assessment reports were published by the EPA in August 2017.

The draft guidelines state in relation to change:

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

Descriptions of changes may cover:

- *Growth*
- *Decommissioning*
- *Other Changes'.*

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

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

The parameters for the future development of the area in the vicinity of the subject site are governed by the Dublin City Development Plan 2016-2022 and the North Lotts and Grand Canal Dock SDZ Planning Scheme. Any adjacent undeveloped lands will be the subject of separate planning applications in the future, where they are identified as being suitable for development, and where the provision of the requisite physical and other infrastructure is available.

2.7.5 Description of Secondary and Off-Site Developments

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

2.8 RELATED DEVELOPMENT AND CUMULATIVE IMPACTS

Each Chapter of the EIAR includes a cumulative impact assessment of the proposed development with other planned projects in the immediate area. The potential cumulative impacts primarily relate to traffic, dust, noise and other nuisances from the construction of the development, with other planned or existing projects, and each of the following EIAR chapters has regard to these in the assessment and mitigation measures proposes.

As such, with the necessary mitigation for each environmental aspect, it is anticipated that the potential cumulative impact of the proposed development in conjunction with the other planned developments will be minimal.

2.9 MITIGATION MEASURES

PD&AE CONST 1: It will be necessary for the appointed contractor to prepare and implement a construction management plan (including traffic management) to reduce the impacts of the construction phase on local residents and ensure the local road network is not adversely affected during the course of the construction project.

PD&AE CONST 2: The appointed contractor should prepare a Construction and Operational Waste Management Plan for the proposed development as part of their contractual responsibilities. The Waste Management Plan should meet the requirements of the Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects.

Chapter 3:

Population and Human Health

3.0 POPULATION AND HUMAN HEALTH

3.1 INTRODUCTION

The 2014 EIA Directive (2014/52/EU) has updated the list of topics to be addressed in an EIAR and has replaced 'Human Beings' with 'Population and Human Health'. This chapter of the EIAR was prepared by Mary MacMahon MSc TCP Pg Dip MSP Pg Dip Env Eng Dip Env Plg Law Dip Mgmt Dip EIA & SEA B Soc Sc MIPI, Executive Director, of John Spain Associates, Planning & Development Consultants.

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

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

3.2 STUDY METHODOLOGY

At the time of writing there is no guidance from the EU Commission on the 2014 EIA Directive to indicate how the new term 'Human Health' should be addressed. Therefore this chapter of the EIAR document has been prepared with reference to recent national publications which provide guidance on the 2014 EIA Directive including the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018) and the Draft Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA in August 2017.

The 2018 EIA Guidelines published by the DHPLG state that there is a close interrelationship between the SEA Directive and the 2014 EIA Directive. The Guidelines state that the term 'Human Health' is contained within both of these directives, and that a common interpretation of this term should therefore be applied.

To establish the existing receiving environment / baseline, several site visits were undertaken to appraise the location and likely and significant potential impact upon human receptors. Desk based study of published reference documents such as Central Statistics Office Census data, the ESRI Quarterly Economic Commentary, the Regional Planning Guidelines for the Greater Dublin Area 2010-2022, the Dublin City Council Development Plan 2016-2022 and the North Lotts and Grand Canal Dock SDZ.

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

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

This chapter of the EIAR document focuses primarily on the potential likely and significant impact on Population, which includes Human Beings as required under the Schedule 6 of the Regulations, and Human Health in relation to health effects/issues and environmental hazards arising from the other environmental factors. Where there are identified associated and inter-related potential likely and significant impacts which are more comprehensively addressed elsewhere in this EIAR document, these are referred to. The reader is directed to the relevant environmental chapter of this EIAR document for a more detailed assessment.

3.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

3.3.1 Introduction

A description of the relevant aspects of the current state of the environment (baseline scenario) in relation to population and human health is provided below. Specific environmental chapters in this EIAR provide a baseline scenario relevant to the environmental topic being discussed. Therefore, the baseline scenario for separate environmental topics is not duplicated in this section; however, in line with guidance provided by the 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:

- Economic Activity;
- Social Patterns;
- Land-Use and Settlement Patterns;
- Employment;
- Health & Safety; and
- Risk of Major Accidents and Disasters.

3.3.2 Economic and Employment Activity

The CSO's Quarterly Labour Force Survey (which has now replaced the Quarterly Household Survey) for Q1 2019, indicated that there was an annual increase in employment of 2.7% or 62,600 over the year, bringing total employment to 2,416,300. This compares with an annual increase of 1.4% or 31,900 in employment in Q1 of 2018.

The increase in total employment of 81,200in the year to Q1 2019 was represented by an increase in full-time employment of 62,600 (+3.5%) and an increase in part-time employment of 18,600 (+4.1%), representing an improvement in the quality and quantity of employment in the economy.

Unemployment decreased by 18,600 (-14%) in the year to Q1 2019 bringing the total number of persons unemployed to 114,400. The CSO state that this is the twenty seventh quarter in succession where unemployment has declined on an annual basis.

Employment increased in twelve of the fourteen economic sectors over the year (excluding *Not stated*). The largest rates of increase were recorded in the *Administrative and support service activities* (+11.4% or +10,800) and the Construction (+10.6% or 10, 500) sectors.

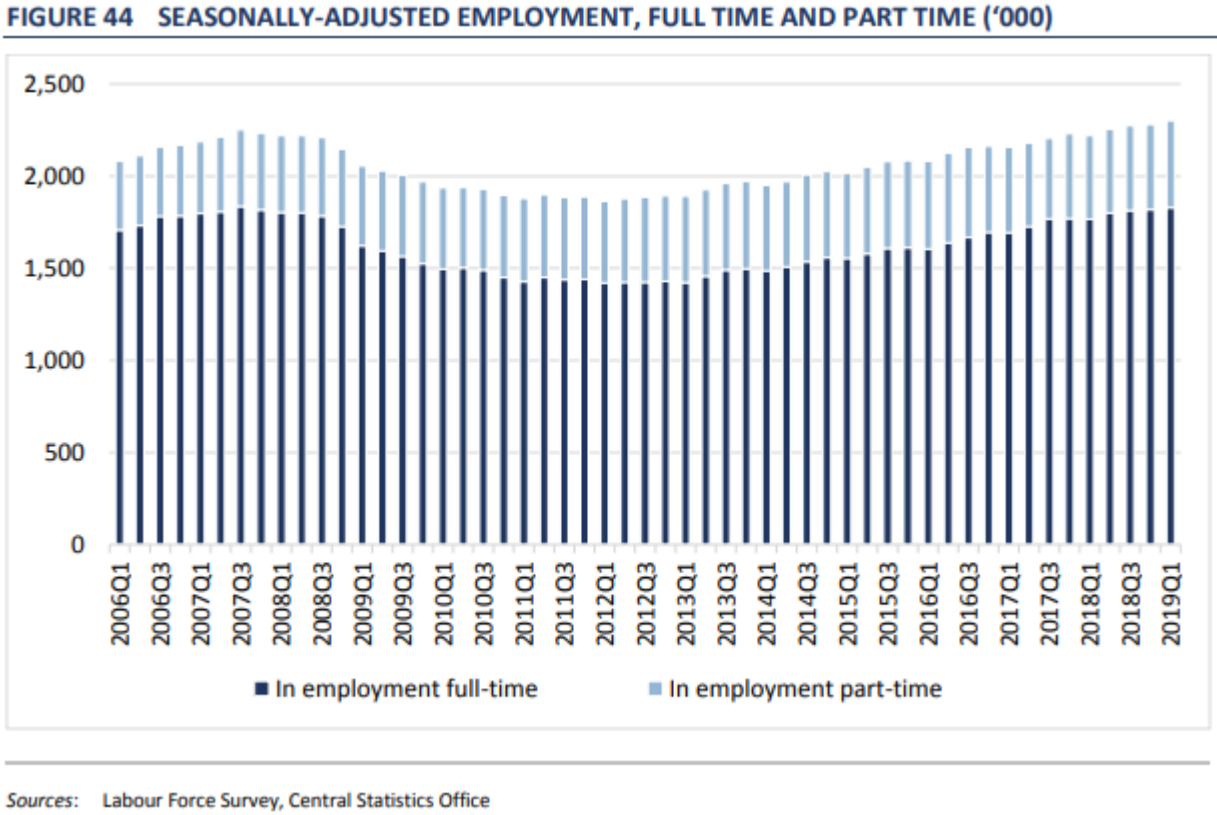
The overall unadjusted unemployment rate decreased from 5.7% to 4.8% over the year to Q1 2019. The total number of people unemployed was 40,900, an annual decrease of -9,300.

The ESRI Quarterly Economic Commentary for Summer 2019 states that an additional 81,200 jobs were added to the economy in Q1 2019 compared to the same period the previous year, representing an increase of 3.7%. This brings the total number of people in employment up to 2,301,900.

The number of people in full time employment increased by 3.5% up to 1,828,900. Over the same period the number of people in part-time employment has increased by 4.1% up to 473,000. The number of people who are part-time underemployed, which is a measure of the number of people who are currently working part time but would like more hours fell by 6% over this period. The fall in this measure suggests there has been an increase in the number of people who moved from part -time to full-time work in the Irish labour force.

The above sources demonstrate that the national economy and employment levels were expected to improve further with the Government faced with the challenge of sustaining economic activity and competitiveness during a period of likely full employment. This in turn results in increased demand for residential dwellings particularly within the Dublin region.

Figure 3.1: Unemployment rate in Ireland by quarter (Q1 2006 – Q1 2019) *CSO Labour Force Survey*



The ESRI Quarterly Commentary further indicates that the construction sector has far the largest growth in employment, increasing by 66.1% over the last five years. This is due to both the low base level of employment in the sector following the housing collapse and the subsequent rapid recovery in the property market in recent years. There have also been significant increases in employment in the admin and support services sector (+40.1%), the transportation and storage sector (+24.4%) and the accommodation and food service sector (23.6%). The only sector in which there has been a fall in employment has been in agriculture (including forestry and fishing) where employment fell by 6.3 % compared to 2014 and 8.6% compared to 2018.

The ESRI Quarterly Commentary notes that while a number of international concerns continue to cast a shadow on the domestic economy, both taxation receipts and labour market indicators suggest that the Irish economy

continues to perform strongly in 2019. Output is still forecast to grow 4.0% in 2019 before moderating somewhat at 3.2%in 2020. Unemployment is set to fall to 4.5% by the end of the year and to 4.2% at the end of next year.

The Irish economy appears to be operating at its full potential level. The continued strong performance of the labour market has resulted in a significant increase in both nominal and real wages in recent years.

3.3.3 Social Patterns

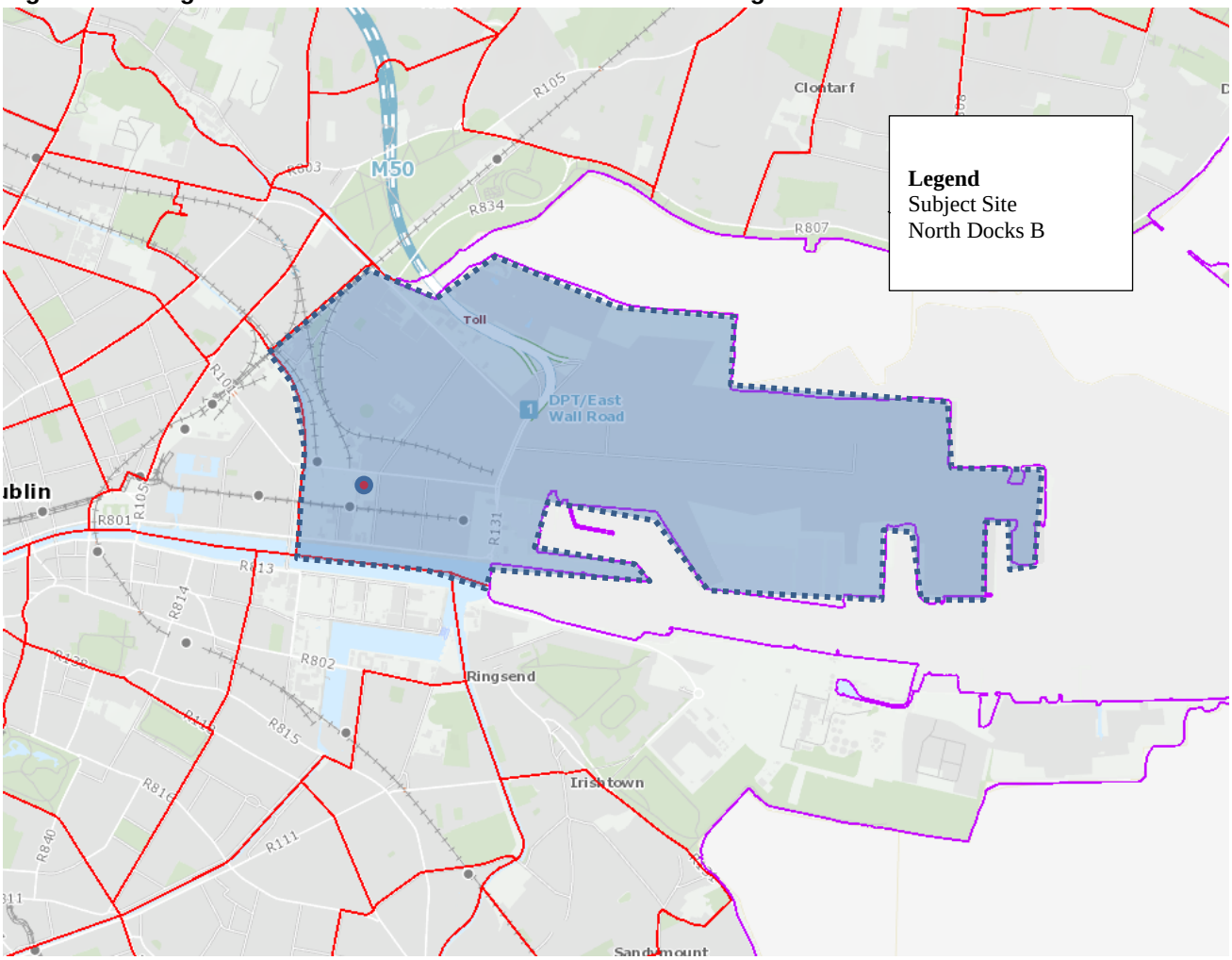
The CSO data illustrates that the population of the Irish State increased between 2011 and 2016 by 3.8%, bringing the total population of the Irish State to 4,761,865. The rate of growth slowed from 8.1% in the previous census, attributable to the slower economic activity in the early part of the census period resulting in a reduced level of immigration, albeit offset to a degree by strong natural increase.

The economy has recovered in recent years with consequent population growth predominantly attributed to natural increase, greater economic activity, increased job opportunities and continued immigration.

Table 3.1: Population change in the State, Dublin County, and North Dock B ED 2011-2016 (Source: CSO)

Area	Number of Persons		
	2011	2016	% change 11-16
Ireland - State	4,588,252	4,761,865	3.8
Dublin County	1,273,069	1,347,359	5.8
Dublin City	527,612	554,554	4.8
Electoral Division of North Dock B	6,895	7,695	10

Figure 3.2: Image of the North Lotts electoral division indicating site location



The population of North Docks B grew almost at double the rate of the overall population growth rate for Dublin County and Dublin City. The growth in the area is also likely to be attributable to the designation of growth areas in this part of the County, the availability and provision of physical and social infrastructure, including the Luas, and the associated redevelopment of this area in recent years for an increase in residential development.

3.3.4 Land Use & Settlement Patterns

The subject site of the SHD application is brownfield in nature. The subject site is c. 1.26 hectares and is located in the north Dublin Docklands area. The site is currently under construction for a residential and aparthotel scheme permitted under Reg. Red. DSDZ2896/18 and DSDZ 4279/19.

The site is well served by public transport including the Luas Red Line and Dublin Bus.

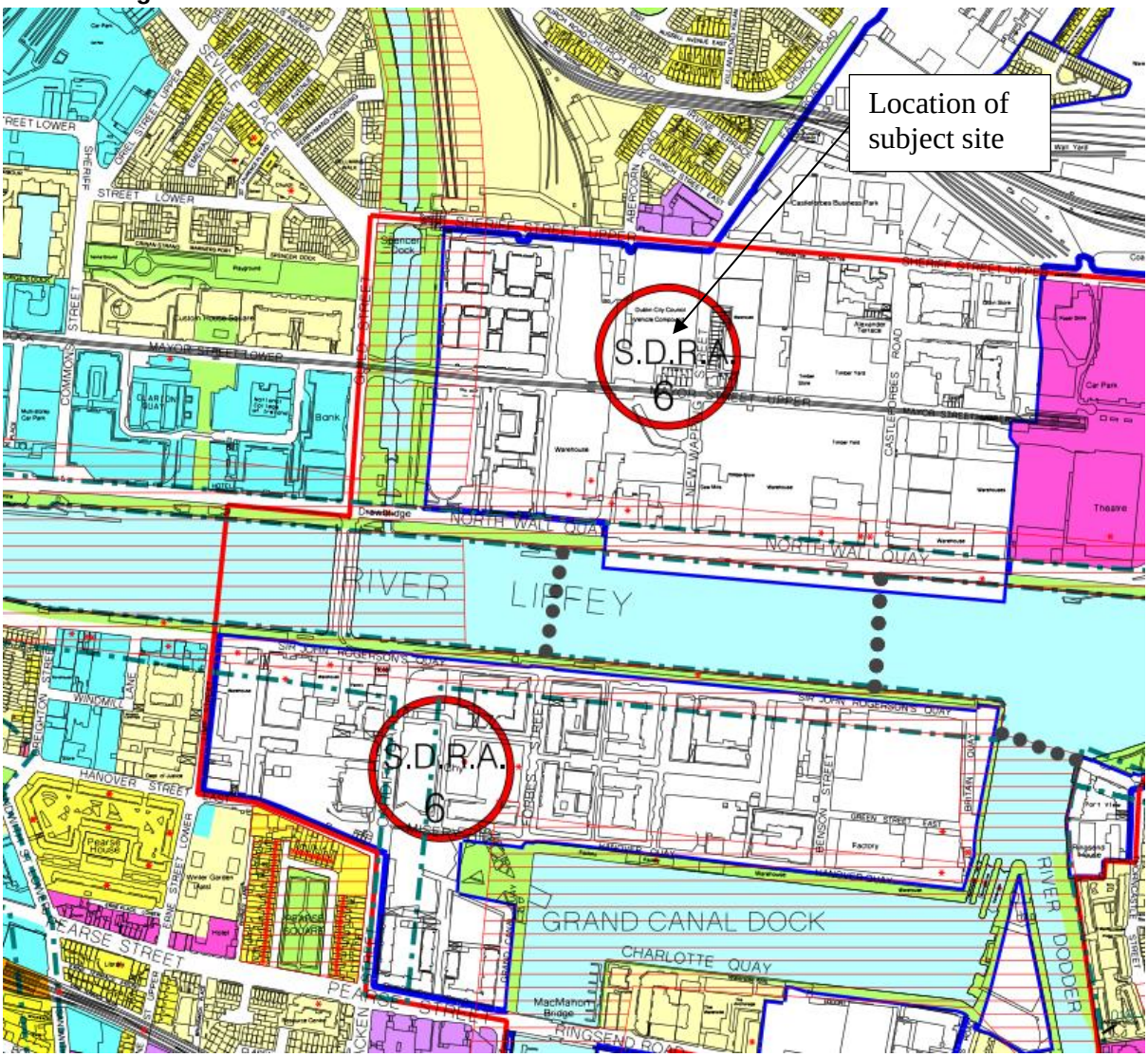
A number of services adjoin and intersect the site including the Luas Line and an Irish Water Pumping Station is located within the centre of the site.

The site is bound to the north by Sheriff Street, to the south by Mayor Street, to the east by New Wapping Street and to the west by a new street.

The subject site is located in an area for high density residential and commercial development with high quality public transport services. The location of the subject site is identified for re-generation as set out in the North Lotts and Grand Canal Dock SDZ Planning Scheme and has the potential to provide for significant residential and commercial development in this part of the city.

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

Figure 3.3: Extract from Dublin City Council zoning map illustrating the subject site and its surroundings



The site is zoned Z14 with the objective *"to seek the social, economic and physical development and/or rejuvenation of an area with mixed use of which residential and "Z6" would be the predominant uses".*

Z14 areas are capable of accommodating significant mixed use development, therefore, developments must include proposals for additional physical and social infrastructure/facilities to support same. Residential development is listed as a permissible use within this zone. The proposed development contains 464 no. residential apartment units and 120 no. shared accommodation units. The proposed mix of uses is compatible with the zoning objective on the site and in line with the Joint City Block Roll Out Agreement and the North Lotts and Grand Canal Dock SDZ Planning Scheme,

Figure 3.4: Aerial view of the subject site

3.3.5 Health & Safety

The surrounding context consists of a mix of commercial, industrial, residential, transport- related, recreational and amenity related land uses. The construction management plan submitted with this application sets out the health and safety measures that will be put in place on site to ensure the appropriate health and safety measures are in place throughout the construction of the development.

3.3.6 Risk of Major Accidents and Disasters

The 2018 EIA Guidelines state that an EIAR must include the expected effects arising from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project. The subject site contains an Irish Water pumping station. The proposed development will not alter or effect the pumping station as part of this development. Ongoing discussions have taken place with Irish Water on the subject site and in relation to the ongoing development on the site. All of the appropriate measures have been put in place to protect the functionality of the Irish Water pumping station. A letter confirming acceptance of the agreed development approach is submitted by Irish Water as part of the planning application.

The proposed development is also located adjacent to the Luas Line. The works proposed on site will not impact on the Luas. An agreed strategy has been put in place for the ongoing works on the site. The proposed development will adhere to the strategy in place and will not impact on the Luas line.

3.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Consideration of the characteristics of the proposed development allows for a projection of the level of impact on any particular aspect of the environment that could arise. In this chapter the potential impact on population and human health is assessed.

A full description of the proposed development is provided in Section 2. In summary the proposed development consists of the construction of 464 no. residential units, and 120 no. shared accommodation units (200 bed spaces) open space and all associated site and infrastructural works on a site of c. 1.26 hectares.

3.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

3.5.1 Introduction

This section provides a description of the specific, direct and indirect, impacts that the proposed development may have during both the construction and operational phases of the proposed development. As stated, guidance documents from the EPA and the Department outline that the assessment of impacts on population and human 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. For a more detailed assessment of potential impacts please refer to specific chapters of the EIAR which assess the environmental topics outlined in the EIA Directive.

3.5.2 Water

Construction Phase

Provision of water infrastructure for the proposed development would involve construction activities within the subject lands. Significant volumes of construction traffic including heavy plant and construction equipment will be present at the site. There is the potential for leaks and spills of fuel and lubricating oils to have a moderate. short term, temporary impact to any receiving surface water in the vicinity of the site.

Surface water runoff from the construction phase may also contain increased silt levels associated with the construction process. Increased silt levels have the potential to reduce water quality in any receiving surface waters. The potential impact from the construction phase on surface water is likely to be short term and moderate without mitigation measures in place.

There is also potential for mobilisation of sediments and harmful substances during the construction phase, due to exposed soil and earth movement, which may be flushed into receiving surface waters during rainfall events; Accidental spills of harmful substances such as petrol or oil during the delivery and storage of harmful substances or by leakages from construction machinery may also occur. However, provided the proposed remedial or reductive measures are implemented, the impact of the proposed development during the construction stage will be of a temporary nature and will be minimised.

Provision of a new water main distribution network would involve construction activities within the subject lands mainly involving trench excavations conducted in parallel with the other services. During the connection of new mains to existing mains off-site there is a small risk that contamination of the existing supply may occur. The potential impact on the local public water supply network would be short term and imperceptible.

The predicted impact of the proposed development is an overall, long term permanent, positive impact to the local and regional area due to the removal of impacted made ground which is a source of contamination.

Operational Phase

The development will result in an increase in the waste water discharged from the site to the public sewer system. The foul outflow from the site will be directed to the municipal treatment plant at Ringsend. Upgrade works are needed as the plant is not currently meeting its requirements under the Urban Wastewater Treatment Directive and increased outflow from development such as the proposed development will increase loading on the Ringsend WWTP. However, planning permission has recently been granted, under Bord Order ABP-301798-18 for an expansion to the WWTP at Ringsend which will increase network capacity by 50%.

There will be a decrease in the rate of surface water run-off from the new development due to the SUDS measures proposed. Surface water run-off will also improve in quality due to these measures. There is very little risk of accidental spillages resulting in water quality issues during the operational stage.

The new development will have an increase in the water supply demand. The impact of the operational phase of the proposed development on the public water supply is likely to be to increase the demand on the existing supply by approximately 244m3/day. As such additional water quantities would need to be treated and supplied through the existing network to the site. This will require extra cost as well as increasing abstraction volumes from the existing source. The potential impact of the proposed development on the public water supply network is likely to be long term and minimal.

Therefore, the potential impact on population and human health in this regard is considered to be insignificant.

3.5.3 Noise

Construction Phase

During the construction phase there will be extensive site works, involving construction machinery, construction activities on site, and construction traffic, which will all generate noise. The highest noise levels will be generated during the general construction activities occur within 30m of the nearest noise sensitive locations to the site boundary. The closest noise sensitive buildings to the proposed development are typically 15m beyond the site boundary. For the purpose of this assessment and to present a typical situation rather than a worst-case assessment the distance from construction works to the nearest sensitive location is assumed to be 40m. During these times there is potential for temporary, negative, moderate to significant noise impacts to occur. For the remainder of construction periods, construction noise impact will be short -term, negative, slight to moderate.

Indicative construction noise levels based on the above assumptions are calculated at 68dB LAeq at the closest noise sensitive locations. The calculated noise levels are within the recommended construction noise limits outlined in Table 10.4. A series of remedial and mitigation measures are proposed in Chapter 10 of this report to further reduce the noise impacts.

The proposed construction phase noise mitigation measures as detailed in the Noise and Vibration chapter of this EIAR shall ensure that all construction activities are controlled and managed and audited by an independent acoustic consultant to confirm that the mitigation measures are implemented throughout the construction phase.

O*perational Phase*

The main potential for altering the noise environment once the development is operational, and thus impacting neighbouring residential receptors, is road traffic noise associated with the development as a result of increased movements on the site. However in the context of the existing noise environment, the overall contribution of induced traffic is considered to be of neutral, imperceptible and long term impact to nearby residential locations.

The number of vehicle trip movements associated with the proposed apartments is determined to increase traffic on the adjoining road network by a magnitude of 1 to 9%. In terms of a noise impact traffic volumes would be required to increase by 25% to generate a 1dB change. Therefore, from a noise point of view, an increase of traffic of this magnitude will be of negligible impact (an increase of less than 0.5dB) and will not be perceptible. The overall effect is described as negligible and long term.

3.5.4 Air Quality & Climate

Construction Phase

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. This has a potential impact on population and human health.

The sensitivity of the area is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. As outlined in Table 6.8, this results in an overall medium risk of temporary dust soiling impacts and an overall low risk to human health impacts as a result of the proposed construction activities.

Overall, in order to ensure that no dust nuisance occurs during the construction and trackout activities, a range of dust mitigation measures associated with a high risk of dust impacts must be implemented. When the dust mitigation measures detailed in Appendix 9.2 are implemented, fugitive emissions of dust from the site will be insignificant and pose no nuisance at nearby receptors.

Construction related dust emissions have the potential to impact human health. As determined above, the likely risk of human health impacts as a result of all relevant construction activities is considered low.

Operational Phase

The operational phase of the proposed development will result in a slight impact on local air quality primarily as a result of increased traffic movements associated with the development.

There is the potential for a number of emissions to the atmosphere during the operational phase of the development. In particular, the traffic-related air emissions may generate quantities of air pollutants such as NO2, CO, benzene and PM10/PM2.5. However, impacts from these emissions have been screened out using the UK DMRB guidance(16), on which the TII guidance(21) was based. This guidance states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment:

Traffic related air emissions have the potential to impact human health if they do not comply with the ambient Air Quality Standards detailed in Table 9.1.

3.5.5 Landscape and Visual Impact

Construction Phase

The construction phase will have short term landscape and visual impacts. The impacts are not considered significant on population and human health, particularly given the level of screening to site boundaries and the setting back of the main residential elements of the scheme from adjacent sensitive land uses.

Operational Phase

Landscape and visual impacts arising from the proposed development potentially will be positive once the construction phase is completed. Ongoing occupation and maintenance of the building will be needed to maintain a positive impact upon the character and amenity of the adjoining streets and the setting of nearby Protected Structures.

Please refer to Chapter 6- Landscape and Visual Impact and the accompanying photomontages for the a more detailed assessment.

3.5.6 Economic Activity

Construction Phase

The construction phase of the proposed development is likely to result in a positive net improvement in economic activity in the area of the proposed development site particularly in the construction sector and in associated and secondary building services industries. The construction sector (including associated services) was documented as one of the most adversely impacted sectors of the Irish economy following the economic downturn in 2008. The sector has recovered in recent years and this development will help to further enhance growth.

The construction of 464 no. residential dwellings, and 200 no. shared accommodation units, and all associated infrastructure will precipitate a positive impact on construction-related employment for the duration of the construction phase.

It is difficult to estimate the number of employees who will be engaged on a residential development such as this, however it is estimated that c. 150 no. people will be employed on the site. A portion of the work will be undertaken by sub-contractors who will also work elsewhere on a phased basis over the construction period.

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

The proposed development could have a slight negative impact on the surrounding area during construction phase due to traffic and associated nuisance, dust and noise. These issues and appropriate mitigation measures are addressed in Chapters 9 & 10 of the EIAR, in the Traffic and Transportation Assessment, Construction and Environmental Management Plan and the Waste Management Plan which accompany the application. The Traffic and Transportation Assessment recommends that a Construction Traffic Management Plan be implemented for the site which will minimise disruption to the surrounding road network.

Operational Phase

The operational phase of the proposed development will result in the provision of 464 no. residential units, 200 no. shared accommodation bed spaces and associated open space. This will provide accommodation for approximately 1,418 persons, based upon the maximum number of bed spaces per unit.

This increase in occupancy in the area will enhance local spending power and will assist with the delivery of a critical mass of population which will support a wide range of additional local businesses, services, transport infrastructure and employment opportunities.

The use of the development as a managed shared accommodation scheme will also generate employment opportunities in itself through the management of the accommodation on site. The provision of a café unit will also generate some local employment opportunities in the area.

3.5.7 Social Patterns

Construction Phase

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

It is acknowledged that the construction phase of the project may have some short-term negative impacts on local residents. Such impacts are likely to be associated with construction traffic and possible nuisances associated with construction access requirements. These impacts are dealt with separately and assessed elsewhere in the EIAR, including Chapter 2 - Project Description and Alternatives Examined, Chapter 9 - Air Quality and Climate and Chapter 10 - Noise and Vibration and also in the Traffic and Transportation Assessment report.

Such impacts will be short term and in the longer term, the completed scheme will have beneficial impacts for local businesses, residents and the wider community. Any disturbance is predicted to be commensurate with the normal disturbance associated with the construction industry where a site is efficiently, sensitively and properly managed having regard to neighbouring activities. The construction methods employed and the hours of construction proposed will be designed to minimise potential impacts to nearby residents. A Construction Management Plan has been prepared and is submitted with this planning application.

Operational Phase

The addition of new residents to the area will improve the vibrancy and vitality of the area and will help to support existing community and social infrastructure. The proposed development will provide much needed homes in this well served area of the County, which will help cater for the considerable and consistent demand in the GDA, which is not being met at present.

3.5.8 Land-Use & Settlement Patterns

Construction Phase

The construction phase of the proposed development will primarily consist of construction works, and has the potential to impact adversely and result in the temporary degradation of the local visual environment on a short-term basis. The visual impacts precipitated by the proposed development are assessed in greater detail in Chapter67.

The construction phase may result in a marginally increased population in the wider area due to increased construction employment in the area, however, this would be temporary in nature and the impact would be imperceptible.

Operational Phase

The operational phase of the proposed development will result in the introduction of a residential land use to the subject site which will provide much needed housing for the growing population of the immediate area and the GDA in general. In addition, a significant quantity of commercial development will enhance and support the proposed and existing residential uses on the site. The provision of open space consisting of recreational and amenity space is also provided.

3.5.9 Employment

The impact of the proposed development in relation to employment has been discussed under economic activity.

3.5.10 Health & Safety

Construction Phase

The construction phase of the proposed development may give rise to short-term impacts associated with construction traffic, migration of surface contaminants, dust, noise and littering. Secondary impacts may include resulting increased traffic arising from hauling building materials to and from the proposed development site which are likely to affect population and human health distant from the proposed development site, including adjacent to aggregate sources and landfill sites.

Construction impacts are likely to be short term and are dealt with separately in the relevant chapters of this EIAR document and will be subject to control through a Construction Management Plan. The construction methods employed and the hours of construction proposed will be designed to minimise potential impacts. The development will comply with all Health & Safety Regulations during the construction of the project. Where possible, potential risks will be omitted from the design so that the impact on the construction phase will be reduced.

Operational Phase

The operational stage of the development is unlikely to precipitate any significant impacts in terms of health and safety. The design of the proposed development has been formulated to provide for a safe environment for future residents and visitors alike. The paths, roadways and public areas have all been designed in accordance with best practice and the applicable guidelines. Likewise the proposed residential units accord with the relevant guidelines and will meet all relevant safety and building standards and regulations, ensuring a development which promotes a high standard of health and safety for all occupants and visitors.

The proposed development will not result in any significant impacts on human health and safety once completed and operational. The proposed development therefore is unlikely to result in negative impacts in relation to population and human health in this regard.

3.5.11 Risk of Major Accidents or Disasters

Construction Phase

Having regard to the topography, geology and location of the subject site, it is not considered likely that there will be any impact related to a major accident or disaster during the construction phase of the proposed development, stemming internally from within the development, or externally.

The works proposed in proximity to roadways and the Luas line will be governed by best practice and appropriate safety procedures, ameliorating any risk of a major accident in those contexts.

Operational Stage

The proposed development will be located on land which is not at any significant risk of flooding. The entrance arrangements have been designed so as to avoid any risk of a major accident associated with the surrounding road network and the Luas line adjacent to the site.

For further details in relation to the junction and entrance layout please refer to the TTA and associated documentation prepared by CS Consulting Engineers.

Therefore, it is considered that there is no significant risk related to major accidents or disasters, external or internal, man-made or natural in respect of the proposed development.

3.6 POTENTIAL CUMULATIVE IMPACTS

The potential cumulative impacts of the proposed development on population and human health have been considered in conjunction with the ongoing changes in the surrounding area.

The cumulative impact of the proposed development will be a further increase in the population of the wider area. The previously brown field lands will provide for 464 no. new residential units across a variety of unit and tenure types. This will have a moderate impact on the population (human beings) in the area. This impact is likely to be long term and is considered to be positive, having regard to the zoning objective for the subject lands, and their strategic location in close proximity to high quality, high frequency public transport, and the high level of demand for new housing in the area.

With regard to human health, the cumulative impact of the proposed development in conjunction with other nearby developments will provide for the introduction of high quality new neighbourhoods in the area with a high level of accessibility and amenity. The overall cumulative impact of the proposed development will therefore be long term and positive with regard to human health, as residents will benefit from a high quality, visually attractive living environment, with ample opportunity for active and passive recreation and strong links and pedestrian permeability, with a direct and convenient link to high frequency public transport modes.

3.7 'DO NOTHING' IMPACT

In order to provide a qualitative and equitable assessment of the proposed development, this section considers the proposed development in the context of the likely impacts upon the receiving environment should the proposed development not take place.

A *'do nothing'* impact would result in the subject lands being constructed as per the permitted developments on the site Reg. Ref. DSDZ2896/18 as amended by DSDZ4279/18 for the construction of 349 no. residential units and an aparthotel of 100 no. rooms.. The status of the environmental receptors described throughout this EIAR document would be likely to remain unchanged. The potential for any likely and significant adverse environmental impacts arising from both the construction and operational phases of the proposed development would not arise.

In terms of the likely evolution without implementation of the project as regards natural changes from the baseline scenario, it is considered there would be limited change from the baseline scenario in relation to population (human beings) and human health.

However, similarly the potential for any likely and significant positive environmental impacts arising from both the construction and operational phases of the proposed development would also not arise. The site is zoned for residential and commercial purposes within the Dublin City Development Plan 2016-2022 with an objective to *"to seek the social, economic and physical development and/or rejuvenation of an area with mixed use of which residential and "Z6" would be the predominant uses"* and the proposed use of the site is considered to be in accordance with the proper planning and sustainable development of the area.

A 'do nothing' scenario would involve the subject site, which is zoned for mixed use development, being developed at a lower density of development in this strategic location which is not in accordance with National Planning Policy.

3.8 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.

Construction Phase

A range of construction related remedial and mitigation measures are proposed throughout this EIAR document with reference to the various environmental topics examined and the inter-relationships between each topic. These remedial and mitigation measures are likely to result in any significant and likely adverse environmental impacts on population and human health during the construction phases being avoided. Readers are directed to Chapter 13 of this EIAR document which summarises all of the remedial and mitigation measures proposed as a result of this EIA.

POP & HH CONST 1: In order to protect the amenities enjoyed by nearby residents, premises and employees a Construction and Environmental Management Plan (including traffic management) should be prepared by the contractor and implemented during the construction phase.

Operational Phase

The operation phase is considered to have likely positive impacts on human beings in relation to the provision of additional residential units and increase amenity spaces to cater for the demands of a growing population in accordance with the principles of sustainable development and residential zoning objectives pertaining to the site.

3.9 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

This section allows for a qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term permanent, temporary, positive and negative effects as well as impact interactions which the proposed development may have, assuming all mitigation measures are fully and successfully applied. It should be noted that in addition to remedial and mitigation measures, impact avoidance measures have also been built in to the EIA and project design processes through the assessment of alternatives described in Chapter 2 of this EIAR document.

Construction Phase

The construction phase of the proposed development will primarily consist of construction works, which are likely to take place over 8-12 months on top of existing construction time currently commenced on site of the planning permission, which will be largely confined to the proposed development site. Notwithstanding the implementation of remedial and mitigation measures there will be some minor temporary residual impacts on population (human beings) and human health most likely with respect to nuisance caused by construction activities.

It is anticipated that subject to the careful implementation of the remedial and mitigation measures proposed throughout this EIAR document any adverse likely and significant environmental impacts will be avoided. Positive impacts are likely to arise due to an increase in employment and economic activity associated with the construction of the proposed development. As outlined above, the construction phase will have both direct and secondary positive economic impacts in this regard.

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

Operational Phase

The proposed development will result in a generally positive alteration to the existing site in terms of the provision of residential units to serve the growing population of the area in accordance with the objectives of the Dublin City Development Plan 2016-2022.

Positive impacts on population and human health will include health benefits associated with the provision of a significant quantity of communal open space, a permeable layout which encourages walking and cycling, amenity and recreational facilities including green spaces, a playground and landscaped seating areas.

The implementation of the range of remedial and mitigation measures included throughout this EIAR document is likely to have the impact of limiting any adverse significant and likely environmental impacts of the operational phase of the proposed development on population and human health.

3.10 MONITORING

In relation to the impact of the development on population and human health it is considered that the monitoring measures outlined in regards to the other environmental topics such as water, air quality and climate and noise etc. sufficiently address monitoring requirements.

3.11 REINSTATEMENT

While not applicable to every aspect of the environment considered within the EIAR, certain measures may be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact to the environment.

There are no reinstatement works proposed specifically with respect to population and human health.

3.12 INTERACTIONS

As noted above, there are numerous inter-related environmental topics described in detail throughout this EIAR document which are of relevance to human health. This chapter of the EIAR has been instructed by updated guidance documents reflecting the changes within the 2014 EIA Directive. These documents are the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018) and the Draft Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA in August 2017. Therefore, in line with the guidance documents referred to, this chapter of the EIAR focuses primarily on the potential likely and significant impact on Population and Human Health in relation to health effects/issues and environmental hazards from the other environmental factors and interactions that potentially may occur.

Where there are identified associated and inter-related potential likely and significant impacts which are more comprehensively addressed elsewhere in this EIAR document, these are referred to. However, the reader is directed to the relevant environmental topic chapter of this EIAR document for a more detailed assessment.

3.13 DIFFICULTIES ENCOUNTERED IN COMPILING

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

3.14 REFERENCES

Regional Planning Guidelines for the Greater Dublin Area 2010-2022.
Dublin City Development Plan 2016-2022.
2018 Labour Force Survey Q4 – www.cso.ie .
ESRI Quarterly Economic Commentary, Spring 2019.
Central Statistics Office www.cso.ie.
Pobal.ie.

Chapter 4:

ARCHAEOLOGY, ARCHITECTURE AND CULTURAL HERITAGE

4.0 ARCHAEOLOGY, ARCHITECTURAL AND CULTURAL HERITAGE

4.1 INTRODUCTION

This chapter of the Environmental Impact Assessment Report has been prepared by Courtney Deery Heritage Consultancy[1] for Spencer Place Development Company Limited. This chapter provides an assessment of the archaeological, architectural and cultural heritage background for a residential development at a brownfield site located at the junction of Sherriff Street Upper and New Wapping Street, Spencer Dock, Dublin 1.

The Block 2 proposed development occupies the corner of Sheriff Street Upper (to the north) and New Wapping Street (to the east), on the north side of the River Liffey. The plot measures approximately 1.1 hectares, with the DART Underground Reservation Strip running along its west side.

There are no recorded archaeological (RMP) sites located within the proposed development site and the site lies outside of the historic core for Dublin City (RMP 018-020, c. 270m south). The nearest RMP site is North Wall Quay (RMP DU018-020524), which was reconstructed in the 1860s, and is located c. 180m south of the proposed development.

The objective of the chapter is to assess the impact of the proposed development on the receiving archaeological, architectural and cultural heritage environment and to propose ameliorative measures to safeguard any monuments, features, finds of antiquity or features of archaeological or cultural heritage merit.

4.2 STUDY METHODOLOGY

4.2.1 Desk Study

This report was based on an examination of published and unpublished documentary and cartographic sources. This report was also informed by the archaeological investigations carried out on the proposed development site (McQuade 2012), as well as those undertaken in advance of construction of the National Convention Centre and adjacent residential buildings as part of the Spencer Dock development, c. 80m west of the proposed site (McQuade, 2003 & 2007; Myles 2007). The following sources were consulted in the course of the study.

- *Record of Monuments and Places (RMP) and Sites and Monuments Record (SMR)*: The primary source of information for the desk study is the Record of Monuments and Places (RMP) of the Department of Culture, Heritage and the Gaeltacht (DCHG). The Sites and Monuments Record (SMR), as revised in the light of fieldwork, formed the basis for the establishment of the statutory RMP pursuant to Section 12 of the National Monuments (Amendment) Act, 1994. The RMP records known upstanding archaeological monuments, their original location (in cases of destroyed monuments) and the position of possible sites identified as cropmarks on vertical aerial photographs. It is based on a comprehensive range of published and publicly available documentary and cartographic sources. The information held in the RMP files is read in conjunction with published constraint maps. Archaeological sites identified since 1994 have been

[1] This report has been prepared by Dr. Yolande O' Brien, archaeologist and researcher at Courtney Deery Heritage Consultancy Ltd. Dr. O' Brien holds a PhD in Archaeology (National University of Ireland, Galway), MA in Landscape Archaeology (National University of Ireland, Galway) and a BA in Archaeology and Classical Civilisation (National University of Ireland, Galway). She has four years of archaeological experience in a variety of contexts involving research, teaching, survey, excavation and the production of mapping.

added to the non-statutory SMR database of the Archaeological Survey of Ireland (National Monuments Service, DCHG), which is available online at www.archaeology.ie and includes both RMP and SMR sites. Those sites designated as SMR sites have not yet been added to the statutory record, but are scheduled for inclusion in the next revision of the RMP;

- *National Museum of Ireland (NMI) Topographical Files*: The topographical files of the National Museum of Ireland (NMI) identify recorded stray finds held in the museum's archive. The files, which are donated to the state in accordance with national monuments legislation, are provenanced to townland and sometimes include reports on excavations undertaken by NMI archaeologists earlier in the 20th century;

- *Dublin City Development Plan 2016-2022*: The current Dublin City Development Plan was consulted for a list of protected structures, the Record of Protected Structure (RPS sites), comprising schedules of buildings and items of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest that are listed for protection in the study area;

- *National Inventory of Architectural Heritage*: The National Inventory of Architectural Heritage (NIAH) was established in 1990 in order to fulfil Ireland's obligations under the Granada Convention which states that '*for the purpose of precise identification of the monuments, groups of buildings and sites to be protected, each Party undertakes to maintain inventories of that architectural heritage*'. The survey of Fingal was carried out in 2002; this building survey highlights a representative sample, and raises awareness of the wealth of architectural heritage in the county. The NIAH surveys can be reviewed at www.buildingsofireland.ie;

- *North Lotts and Grand Canal Dock Planning Scheme, Dublin City Council 2014*: The North Lotts and Grand Canal Dock was designated as a Strategic Development Zone (SDZ) as part of the larger Master Plan of the Dublin Docklands Development Authority. The North Lotts and Grand Canal Dock Planning Scheme was created to facilitate and guide development in this area. The conservation of the Docklands' architectural heritage is a key component of the SDZ Planning Scheme, which aims to ensure *'that the architectural and historical significance of the Docklands area is protected, conserved and enhanced'*. Best practice is promoted for archaeology in the area, including *'archaeological excavation and the dissemination of the findings of archaeological investigations through the publication of excavation reports…'*. (See Appendix 4.4);

- *Dublin City Industrial Heritage Record*: The Dublin City Industrial Heritage Record survey makes recommendations for sites to be added to the list of Protected Structures;

- *Excavation Bulletins and Dublin Archaeology Data Viewer*: The 'Excavations' bulletin published by Wordwell and on the website www.excavations.ie, was consulted for any previous relevant archaeological surveys and excavations that have taken place on or in the vicinity of the proposed development. The 'County Dublin Archaeology Data viewer' also provides excavation information for County Dublin in the form of a webGIS in which archaeological excavations are mapped with excavation reports provided. It is available at www.heritagemaps.ie;

- Cartographic sources consulted include de Gomme (1673), Bolton, (1717), Brooking (1728), Rocque (1757), Taylor (1816), Clarke's map of a conjectural medieval city superimposed on the 1943 edition of the Ordnance Survey (OS) map (not shown) and various editions of the OS Maps;

- Additional documentary and literary references consulted are listed in the bibliography;

- Aerial photographs were examined to confirm current land use and the brownfield nature of the site (www.osi.ie & Google Earth).

4.2.2 Standards and Guidelines

The following legislation, standards and guidelines were consulted to inform the assessment:

- National Monuments (Amendments) Acts, 1930-2014;
- The Planning and Development Act 2000, as amended;
- Heritage Act, 1995;
- The UNESCO World Heritage Convention, 1972;
- ICOMOS Xi'an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas, 2005;
- Council of Europe Convention for the Protection of the Architectural Heritage of Europe (Granada) 1985, ratified by Ireland in 1991;
- Council of Europe European Convention on the Protection of the Archaeological Heritage (Valletta) 1992, ratified by Ireland in 1997;
- The Burra Charter, the Australia ICOMOS Charter for Places of Cultural Significance 2013;
- The European Landscape Convention (ELC), ratified by Ireland 2002 European Landscapes Convention 2010. (The Department of the Environment, Heritage and Local Government 'Landscape and Landscape Assessment Guidelines' have been in draft form since 2000, however the Draft National Landscape Strategy (NLS) was launched in July 2014);
- Guidance on Heritage Impact Assessments for Cultural World Heritage Properties – A publication of the International Council on Monuments and Sites, January 2011;
- Guidelines on the information to be contained in Environmental Impact Statements, 2002, EPA;
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements), 2003, EPA;
- EPA: Draft Revised Guidelines on The Information to be Contained in Environmental Impact Assessment Reports, August 2017;
- EPA: Advice Notes for Preparing Environmental Impact Statements, Draft, September 2015;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht and Islands;
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Planning and Development Act 2000;
- Code of Practice between the National Roads Authority (NRA) and the Minister for Arts, Heritage and the Gaeltacht, June 2000;

- Guidelines for the Assessment of Architectural Heritage Impact of National Road Schemes, 2006, NRA;
- Guidelines for the Assessment of Archaeological Heritage Impact of National Road Schemes, 2006, NRA;
- Guidelines for the Testing and Mitigation of the Wetland Archaeological Heritage for National Road Schemes, 2006, NRA; and
- National Landscape Strategy for Ireland 2015-2025, Department of Arts, Heritage and the Gaeltacht.
- Historic England (July 2015), Historic Environment Good Practice Advice in Planning, Note 3: The Setting of Heritage Assets;
- Historic Scotland (October 2010), Managing Change in the Historic Environment;
- The Heritage Council (2010), Proposals for Irelands Landscapes; and International Council on Monuments and Sites (2011), Guidance on Heritage Impact Assessments for Cultural World Heritage Properties.

Excerpts from the relevant legislation are contained in Appendix 4.2 of this chapter.

4.2.3 Rating of Impacts

Cultural heritage sites / landscapes are considered to be a non-renewable resource and cultural heritage material assets are generally considered to be location sensitive. In this context, any change to their environment, such as construction activity and ground disturbance works, could adversely affect these sites. The likely significance of all impacts is determined in consideration of the magnitude of the impact and the baseline rating upon which the impact has an effect (i.e. the sensitivity or value of the cultural heritage asset). Having assessed the magnitude of impact with respect to the sensitivity/value of the asset, the overall significance of the impact is then classified as imperceptible, slight, moderate, significant, or profound. A glossary of impact assessment terms, including the criteria for the assessment of impact significance, is contained in Appendix 4.3 of this chapter.

In accordance with the NRA 'Guidelines for the Assessment of Archaeological Heritage Impact of National Road Schemes' (2006) the significance (i.e. value) criteria used to evaluate an archaeological site, monument or complex are as follows: existing status (level of protection), condition or preservation, documentation or historical significance, group value, rarity, visibility in the landscape, fragility or vulnerability, and amenity value. The archaeological and cultural heritage environment is assigned a baseline rating, taking into account the importance, value and / or sensitivity of the receiving environment (Cf. Table 4, Appendix 4.3).

4.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SITUATION)

4.3.1 Site Location and Context

The site of the proposed development and its environs, in the modern Spencer Dock area, formed part of the mudflats that extended along the Liffey estuary until the large-scale reclamation projects that began in the late 17th century. The historical background (section 4.3.5) of the study area examines the evidence for settlement on the proposed site from the 17th century onwards, with archaeological evidence for earlier, prehistoric activity within the estuarine mudflats discussed in section 4.3.4.

4.3.2 Recorded Archaeological Sites and Monuments

The entire 'Historic City of Dublin' has one generic reference, DU018–020; the proposed development lies outside of this area c. 180m to the north (Figure 4.1). All sites within the historic core are prefixed with this code and are then given their own unique number. For example, site number 524 within the historic core (the northern quay wall) is listed as DU018-020524. The quay wall along North Wall Quay (RMP DU018-020524), which was reconstructed in the 1860s, is located c. 180m south of the proposed residential development and will not be impacted. The quay wall is described in the context of the historical development of the area in Section 4.3.5.

4.3.3 Stray Finds

Only one stray find is recorded from the North Lotts area. An iron knife-shaped object of unknown date and function was uncovered during the excavation of the foundations for New Church at East Wall Road, at a depth of c. 6 feet or c. 1.8m (NMI Reg. No. 1954:168). According to the NMI record, it was sitting on the gravel bed of the former foreshore of the Liffey and 'the top portion of the excavation was filled-in ground' and during excavations 'shells etc. came to light'.

4.3.4 Prehistoric Riverine Activity in the Spencer Dock Area

The earliest human activity in Ireland dates from the Mesolithic period (*c.*8000-4000BC), with the evidence indicating a strong preference for riverine and coastal areas. In the greater Dublin area for example large numbers of Mesolithic tools have been recovered from the Malahide and Rogerstown estuaries. Middens are also recorded at Sutton to the north of Dublin Bay and at Dalkey Island to the south. Evidence for activity in the vicinity of rivers, the sea and indeed lakes probably reflects the importance of fish in the diet of Mesolithic people, a trend observed in other European countries. Furthermore, given the absence of the large mammals hunted in mainland Europe, it is even more likely that fish and fowl were important sources of meat in Mesolithic Ireland (*After McQuade 2007*).

There is very little evidence for prehistoric activity in the Dublin city area, although a number of artefacts recovered from excavations indicate a prehistoric presence on and around the banks of the Liffey. The most significant evidence for prehistoric activity along the Liffey, however, was revealed during archaeological investigations at the Spencer Dock development site on North Wall Quay in 2004 and 2006-7, c. 160m southwest of the proposed development site (this large block of land now houses the National Convention Centre and adjacent residential buildings; Figure 4.2). The material uncovered had been sealed beneath 18th century reclamation deposits and post-medieval structural remains and was located at the southern end of the site, in an area formerly occupied by the Liffey estuary (McQuade, Excavations 2003:0576, Licence No. 03E0654; Myles & McQuade, Excavations 2006:634 & 2007:494, Licence no. 06E0668; some of the post-medieval remains were located c. 80m west of the proposed development; see section 4.3.5).

The excavations revealed evidence relating to prehistoric riverine activity in the silts which had accumulated to the south of the former shoreline of the Liffey, *c*. 13m–16m north of the North Wall Quay. This included the discovery in 2006/7 of Late Mesolithic fish trap remains (radiocarbon dated to 6000-5840 BC) and a mid-Neolithic wattle fence (which was probably also part of a fish trap structure) and dated to 5980-5760BC (located at depths of -5m OD and c -4.66m OD respectively; McQuade 2007).

The Late Mesolithic fish traps excavated in 2006/7 are similar to the very well-preserved archaeological remains of up to five finely woven wooden fish traps of late Mesolithic date (6100-5720 cal. BC) identified

in 2003/4 on the adjacent site to the east. The wooden remains were preserved in the silt deposit, with the activity concentrated c.1.2–1.3m to the south of the early shoreline of the river Liffey and in the estuarine waters to the south at an average depth of -5m OD (McQuade, 2005).

The discovery of the first fish traps in 2003/4 was of international significance as they were the earliest dated examples recorded in either Ireland or the UK. They provided the first definitive evidence for the use of fish traps in Ireland during the Mesolithic period. The subsequent discovery of another Late Mesolithic fish trap nearby illustrates that the Late Mesolithic population of the Dublin area were, over a period of up to 200 years, fishing along a 70m a stretch of the Liffey intertidal zone in the area currently known as Spencer Dock. The remains of the large wooden Middle Neolithic fish trap further indicates that several millennia later, the occupants of the surrounding area were once again fishing along this part of the Liffey estuary (McQuade 2007). Although no evidence for prehistoric settlement was uncovered at the site, the people who constructed and used the fish traps must have been living nearby.

There is tantalising evidence of further waterlogged wooden remains of possible prehistoric date on the proposed development site itself, though unfortunately no radiocarbon dates were available at the time of writing. They were uncovered during archaeological monitoring of bulk excavations by Archaeological Development Services (ADS) Ltd in 2011/2012 in advance of the planned North Lotts pumping station on the present proposed development site (Figure 4.2).

The remains comprised two clusters of horizontal brushwoods that were identified in the sandy silt deposit at levels of between -1.39m and -1.43m OD, which is significantly closer to present ground level than the remains found on the NCC / Spencer Dock site. The arrangement of the surviving wood pieces did not retain the original form of the structures from which they came. In addition, there were no *in situ* pegs and none of the pieces could be described as stakes. Nonetheless, the remains may represent parts of larger structures, possibly fish-traps that had been damaged and displaced by the tide (McQuade 2012; Licence No. 09E0375).

All of the remains were preserved by record by means of archaeological excavation (McQuade 2012), though post-excavation analysis was not completed, due to funding problems on the part of the developer (*Pers. Comm*. Eoin Halpin, ADS Ltd, June 2015).

4.3.5 Historical Development of the Spencer Dock Area, 17th to 19th centuries

Introduction

The primary source for the early history of the area is the *Calendar of Ancient Records of Dublin* (*CARD*), the earlier volumes of which were compiled by Sir John Gilbert in the last decade of the 19th century. The *CARD* volumes record the activities of the Municipal Corporation of Dublin and, from 1708 onwards, the Ballast Office, which elected its committee of directors from the City Assembly.

The other historical sources used are primarily cartographic in nature. They include the 'Map of the Strand on the North Side of the Channel of the Liffey' of 1717 (known as 'Bolton's Map'; Figure 4.4), a pictorial representation of the notionally reclaimed area drawn up by J. Macklin during the mayoralty of Thomas Bolton and later maps drawn up for the Wide Streets Commissioners (WSC). Other maps consulted were Bernard de Gomme's *The citty and suburbs of Dublin,* 1673 (Figure 4.3)*;* Charles Brooking's *A map of the city and suburbs of Dublin,* which also contains *A Prospect of the city from the North* (1728, Figures 4.6, 4.7); John Rocque's *Plan of the city of Dublin and the environs* of 1757 (Figure

4.5; his better-known *Exact survey of the city and suburbs of Dublin* published in 1756 stops a few hundred meters short of the Spencer Dock area); John Taylor's *Map of the Environs of* Dublin (1816, Figure 4.8); and the *Modern plan of the city and environs of Dublin, including the Grand and Royal Canals, new docks, etc.,* published in *Wilson's Dublin Directory* in 1798 (not shown). Various editions of the Ordnance Survey were consulted for the later period of the site's development (Figures 4.13).

Evidence for post-medieval activities uncovered during archaeological investigations in the Spencer Dock / North Lotts area has also been incorporated into the historical background.

Early Reclamation Efforts

The relatively settled state of Ireland after the succession of James II (r. 1685–88) acted as a catalyst to the continued expansion of urban centres beyond the medieval walls. New ground for building was required to ease the accommodation situation within the city of Dublin, and this coincided with the necessity of keeping the harbour open to shipping (the silting up process had always been a problem for the medieval port). Both of these requirements would act as the impetus for the reclamation of lands along the River Liffey in the ensuing centuries.

Two maps produced by Sir Bernard de Gomme in November 1673 depict the city and harbour in the period immediately prior to the reclamation of the slob lands to the northeast of the city. The map of the harbour was produced as a supplement to the better-known city map (Figure 4.3) and included a contemporary account of the approaches to the port. Of particular interest is the description of the area occupied by today's Gardiner and Lower Abbey Streets as 'marsh ground,' while the slope to the north towards Mountjoy Square and Summerhill is depicted as 'the heights.'

The general area of the proposed development site is located among the tortuous channels of the Liffey, where areas of mud may have been exposed at spring tides (Figure 4.3)**.** The situation was further complicated by the estuary of the River Tolka, which emerged from the northwest, the confluence of both rivers leaving only one area of high ground, Clontarf Island, exposed at high tides. The shoreline depicted by de Gomme would appear to start from a small promontory in the general area of the Abbey Theatre, continuing along a line which today extends along Amiens Street as far as the Five Lamps before turning slightly to the north between Ballybough Road and North Strand Road to Luke Kelly Bridge (over the Tolka) and on to Fairview Strand (De Courcy 1996, 270).

The period leading up to the Confederate Wars of the 1640s saw interest grow in the financial possibilities of reclamation work along the south side of the river. This is reflected in the number of disputes between the City Assembly and prominent property speculators of the day. While reclamation work initially focused on the opening of a direct and secure route to Ringsend, the need for a secure harbour to advance the interest of the city's merchants and traders became paramount. But William Hawkins's construction of a wall along the river as far as the present-day Townsend Street in 1662–63 was to have an adverse effect on the northern side of the river, where the force of the incoming tide would redirect the flow, causing the formation of sand banks and shallow streams that were even more hazardous to shipping (*CARD* vi, 402).

In 1682 the City Assembly commissioned a survey of the area stretching eastwards to the present-day East Wall Road. As the shoreline had been included in the riding of the franchises as early as 1488, any land reclaimed was ostensibly in the hands of the city, though private development would be encouraged with preferential rents and leases. This resulted in the division of a notional area comprising 'the strand

between Mabbot's Mill [in the area of Connolly Station] and the Furlong of Clontarf' into 152 lots, which were to be granted to the mayor, recorder, aldermen, sheriffs, sheriffs' peers and remainder of the common council, along with one lot each to the clerk of the Tholsel and the city surveyor. The lots were to be drawn from a hat after the lord mayor and recorder had made their choice, and the rent was set at 12 pence sterling per annum (*CARD* v, 328).

The area was still subject to flooding at high tide and it was a condition of the allocations that each owner would protect his lot against inundation. The obligation 'to take in and improve' the plots does not appear to have secured the new land from the sea, however, as four years later the assembly annulled the granting of the strand 'forasmuch as there were great disorders in doing the same' (*CARD* v, 383–4). This decision may indicate that such a huge reclamation undertaking was beyond the efforts of the individual leaseholders and that a more systematic effort would be necessary, perhaps backed by municipal authority, in order to save and reclaim the area from the sea. The city would not, however, be in a position to support such an undertaking for another generation and by the close of the 17th century, it is highly unlikely that any development had taken place in the lands east of the present North Strand Road.

Reclamation During the 18th Century

Jurisdiction over tidal waters had for a long time been a contentious issue in Dublin. Ostensibly vested in the crown and exercised on the crown's behalf by the lord high admiral, the medieval city charters had given the city the right to construct quays and other structures associated with trade along the river's banks. As trade developed in the post-medieval period, there was a growing demand for the city to also take over responsibility for the port and navigation. Private attempts to establish a port authority had, however, been frustrated by the crown's claim to the foreshore and harbour. Finally, in 1707, the city effectively bribed the lord high admiral with an annual payment of 100 yards of Irish sail cloth and an act was passed to establish the Ballast Office.

The reclamation of the area between the city and Ringsend has been well documented in the secondary sources (for example, de Courcy 1996, 333–5). It was accelerated by the assembly's granting of an estate along the south strand in 1713 to Sir John Rogerson, who immediately began to enclose his new land with a massive sea wall, thus relieving the Ballast Office of the responsibility. Plans were soon afoot to extend Rogerson's wall out into the bay to provide safer entry for shipping into the port. The Ballast Office now concentrated its efforts on the northern bank of the river, and as early as May 1712, work commenced along the line of the present-day Eden and Custom House Quays. By October, 686 kiskes (baskets filled with stone) had been laid down, approximately as far as the western end of the North Wall (*CARD* vi, *passim*). A second wall was built to the rear of these kiskes during the 1720s with further filling material added.

The construction of retaining sea walls was necessary not only for land reclamation purposes, but also to vastly improve the river and port for shipping and trade. Prior to this time, anyone trying to enter Dublin had to navigate the treacherous and unpredictable sandbanks at the mouth of the Liffey. These hazards were created by the confluence of the river **Dodder** on the southside and the Tolka on the northside and untold numbers of vessels had run aground upon these banks. Three huge restraining walls were created on the north (North Wall) and south shores (South Wall), with a third wall to the city's north east that would restrain the Tolka.

As the northern wall began to extend further into the eastern slob lands, the City Assembly ordered that the area between the Tolka and the Liffey, along with the slob lands between the Tolka and Clontarf, be

re-surveyed and this time notionally divided in 132 lots, to be known as the 'North Lots' (*CARD* vii, 30-34; this spelling also appears on Rocque's map of 1757, but the modern spelling 'Lotts' will henceforth be used throughout the report).

The survey was carried out by J. Macklin in 1717, and the resultant schematic map – known as Bolton's Map after the sitting lord mayor – shows both the plots themselves and the names of the initial lease holders (Figure 4.4). This makes it possible to ascertain that the plots located within the proposed development site were, at least initially, leased to Alderman George Fforbes, Thomas Burrows and John Holne.

As well as being a practical survey document, the map demonstrates confidence in the future development of what effectively became a polder, with all of the North Lotts area neatly laid out and apportioned. However, to best appreciate what the City Assembly intended, it is necessary to examine John Rocque's *Plan of the city of Dublin and the environs*, which was published in the city in 1757, just as the reclamation project should have been nearing completion (Figure 4.5).

Rocque's map names the area as 'The North Lots' and shows a street pattern laid out in grid form, the uniformity of which contrasts with the sprawling medieval city to the southwest. The great North Wall (depicted by Rocque as having an underlying strand extending eastwards for over half its length) fronted a wide quayside, with Mayor Street running parallel to the north. These two thoroughfares were linked by six streets, spaced at regular intervals: an unnamed street to the west, Commons Street, Guild Street, Wapping Street, Fish Street and the East Wall; the areas in between were divided into long, narrow property plots as indicated on the earlier Bolton's Map.

Further to the north lay Sheriff Street, again linked to the waterfront by connecting streets that terminated along its line. The property plots between Mayor Street and Sheriff Street – where the proposed development is situated – were twice the width of those on the waterfront, possibly to accommodate the larger houses of the new inhabitants (Figure 4.5). The area north of Sheriff Street is laid out in much bigger plots that were accessed from The Strand to the west and from West Road, Church Road, East Road and the East Quay, all angled northeastwards off Sheriff Street. A pool of water is depicted in the very northeast corner of the polder (not shown), with streams shown flowing through the northern part of the area, indicating the unfinished state of the reclamation work.

The majority of the street names shown on Rocque's map were simple descriptive names – The North Wall (now North Wall Quay), East Quay (now East Wall Road) and West Road – or were names associated with city governance (most of the lots were gifted to Corporation members). The latter includes Guild Street (for the Guilds from which the Corporation of Dublin was then composed), Mayor Street and Sheriff Street (both titles of office) and Commons Street (named for the City Commissioners, now Councillors, on the old Municipal Council of Dublin). Wapping Street was probably a nod to the London dock district of the same name. The reason for so-naming Fish Street is unclear: perhaps a reference to its intended use as a fish market; or after a Corporation member (there is a William Ffisher on Bolton's map); or possibly even a sole reference to riverine activities that once took place in this area. The naming of Church Road is remarkably premature, as there was no church on or in its vicinity until sometime in the earlier 20th century. This is either incredibly advanced planning or perhaps a good example of how the best laid plans did not always come to fruition in the North Lotts.

In April 1724, the Ballast Committee informed the City Assembly of its financial difficulties in carrying on projects on both sides of the river simultaneously. A subsequent vote was carried to extend funding to

complete the North Wall before moving on to the piling for the South Wall (*CARD* vii, 257–9). This vote indicated the importance being placed on northside development at that time by the members of the assembly (many of whom were lot holders).

To a greater extent, the urban project at the North Lots was eclipsed by developments happening elsewhere in the city. From the 1740s onwards, the northside estates of Luke Gardiner had attracted those with sufficient funds to invest in property at the upper end of the market. The focus for such investment was soon to shift to the southside again following the construction of Leinster House and the development of the Fitzwilliam estate a decade later, and this area has remained the most fashionable in Dublin until the present day. The Act of Union and the resultant exodus of the fashionable classes to London emptied many of the large houses, which soon fell prey to speculative landlords, thus becoming tenements. This phenomenon was particularly evident in the Gardiner estates adjacent to the North Lotts. The slowing demand for accommodation at the upper end of the market was probably detrimental to the development of the North Lotts and perhaps retarded the progress of the works. Charles Brooking's *A Map of the City and Suburbs of Dublin*, which included '*A Prospect of the City of Dublin from the North*', purports to show the development in 1728. H. A. Gilligan (1988, 25), an authority on the port of Dublin however, considers this depiction to be premature.

Brooking's map of 1728 shows the North Wall 'Walled in but as yet overflow'd by ye Tide' (Figure 4.6). Brooking's prospect of the same date shows ships on the river, their reflections evident on the water behind the North Wall (Figure 4.7); in contrast, the area of high ground south of the Tolka appears to be well established with trees and several houses.

It would seem likely, therefore, that the impetus to reclaim the North Lotts came more from the necessity of providing a safe channel for shipping, rather than as an attempt to provide more building ground for the city. The changing political situation at the turn of the 19th century dealt the final blow to any possibility of aristocratic or other major residential settlement on the polder; by the publication of the first edition of the Ordnance Survey in 1837, the industrial nature of the area was becoming increasingly obvious.

Industrial Development in the 19th Century

The first recorded industrial activities in the North Lotts area – a windmill and the Royal Canal – are both shown on Taylor's 1816 map, located in the vicinity (west) of the proposed development (Figure 4.8).

The windmill depicted on the 1816 map was located some 100m east of the mouth of the Royal Canal and its circular stone foundations were uncovered during archaeological investigations in advance of the National Convention Centre / Spencer Dock (NCC) development in 2003/4 (McQuade Excavations 2003:0576, Licence No. 03E0654).

In December 1810, *The Times* reported that '*a dreadful fire*' had broken out in the North Wall and '*the Windmill and Corn Stores were wholly consumed*' within five hours (Bunbury 2009). Although the location of the corn stores is not indicated on the map, a Brocas engraving of a fire at a milling complex on the North Wall Quay of c. 1810 depicts a substantial structure just to the west of the prominent windmill (Figure 4.9). Further investigations at the NCC site in 2006/7 uncovered the partial remains of a substantial structure beneath the mid-19th century railway terminus in this approximate location and although there was no evidence of burning in the area excavated, it is likely that the structure formed part of the corn stores (Myles Excavations 2007:493, Licence No. 06E0668).

It is possible that the apparent discrepancy on Taylor's map (showing the windmill in situ six years after the fire) simply indicates that the survey took place when the windmill was extant and that no adjustments were made to the map prior to its publication in 1816. Alternatively, the windmill may have been reconstructed after the fire. If the latter is true then the windmill was short-lived as it is not shown on the slightly later, more detailed first edition Ordnance Survey map of 1837 (Figure 4.10); the site later became railway sidings and stores (De Courcy 1996, 421).

Given the lack of detail on Taylor's map, it is instructive to compare the first six-inch edition of the Ordnance Survey in 1837 (Figure 4.10) to Rocque's map of 1757 (Figure 4.5). The maps are striking in their similarities – despite the passing of eight decades – most notable and visibly in the uniform grid pattern of the streets and the relative lack of development (this is also evident on Taylor's map). Some areas behind the East Wall are obviously still under reclamation; indeed, as late as 1835, a request was submitted to the Ballast Committee for one thousand tons of river mud to reclaim a 'low North lot' (Gilligan 1988, 19).

This state of affairs appears to have been relatively common and a result of the poor construction of the initial North Wall. The original wall was shoddily built and a constant source of vexation to landowners in the area, a fact noted by Gandon when he began work on the Custom House in the 1780s (Bunbury 2009). In 1786, Francis Tunstall, the Ballast Board's first inspector of works, proposed the demolition and reconstruction of the entire wall east of the Custom House, though nothing was done at that time. In the 1830s, William Cubitt, one of the greatest civil engineers of the day, came to much the same conclusion in a report on the North Wall's deep-water berthage capabilities. By the 1840s, not long after the first Ordnance Survey of the area, the North Wall was described as a dismal swamp and had sunk from 10 to 15 feet below the level of the roadway; the gap was filled with the refuse from the streets and the dredging of the river and there was scarcely a building of any kind left on it (Bunbury 2009).

Unsurprisingly then, little building work had been carried out in the area by 1837 and almost none at all within the proposed development site (Figure 4.10), a picture that is little changed by the time of the 1864 OS revised edition 5-foot town plan (not shown). The only real indication that any of the 1717 plot holders had developed their land for the intended residential use is evident in the names of two houses, 'Castle Forbes' on the north side of Sheriff Street and 'Forbes Castle' further north on East Road', both of which are located close to the plot of Ald. George Fforbes as shown on the 1717 map. There is also a small terrace of five houses fronting onto Sheriff Street, with extends partly within the proposed development site, on John Holne's plot.

The most significant difference in the area since the mid-18th century is the Royal Canal, which bisects the North Lotts and enters the Liffey between Guild and Wapping Streets (as seen on Taylor's 1816 map; Figure 4.8). The construction of the Royal Canal began after 1789, and the map published in *Wilson's Dublin Directory* in 1798 (not shown) depicts the connection to the Liffey through a system of locks. This work cannot, however, have been undertaken before 1806, when an appeal was made by the Royal Canal Company (RCC) for more funding to bring the canal to the river. Two berthing pools, the Royal Canal Docks, lay between the riverfront and Mayor Street and between Mayor Street and Sheriff Street, while a spur extended to the west from the northern pool (although depicted on Taylor's map of 1816, this was filled-in by 1837).

The gradual growth of industrial activities can be seen on the 1837 map, no doubt influenced by the increased trade and ease of transport at the Royal Canal Docks. This is particularly evident in the cluster of buildings arrayed along the canal banks and in the plots fronting the North Wall quay, including several

Vinegar Works and a Vitriol Works (the latter a short distance south of the proposed development site; Figure 4.10).

The canal enjoyed a relatively short period of success before the advent of the railways in Ireland in the mid-19th century. An association between railway and canal occurred in 1845, when the Midland Great Western Railway Company (MGWR) acquired a majority interest in the RCC with the intention of closing the canal and running the tracks along the bottom, thus saving on land purchase and surveying costs. The RCC had, however, acquired enough land for the railway to run alongside the canal, at least initially, and the MGWR kept it open without investing further in its operation.

As happened elsewhere, however, the development of the railway system eventually rendered the canals practically obsolete. By the 1870s, British coal was heating houses throughout Ireland and although the MGWR were making considerable money from this business, the Royal Canal Docks were simply too small to accommodate the huge new coal ships and the company was losing ground to the Grand Canal Docks on the south (Bunbury 2009).

The increase in passenger traffic to the North Wall was promoted by the use of larger, faster steam-powered vessels, which required deeper berthage than that provided at the railway terminus. Although the port was to develop deeper berthages down river, the problem of shallow water had been anticipated by 1842, when wooden wharves were constructed against the quay wall for 500 yards (*c*. 457m) on either side of the opening of the Grand Canal Docks (Gilligan 1988, 125). Increased competition for berthage led to the extension of the timber wharves from the Custom House Dock to the present-day Castleforbes Road by the early 1860s (Gilligan 1988, 125–6), but the problem of berthing at the North Wall at low water remained an issue.

The solution involved the construction of a new masonry quay wall several meters further out into the river. The potential (and real) profits available from the coal trade also undoubtedly acted as an impetus for the rebuilding of the North Wall Quay (RMP DU018-020564; Figure 4.1), which was finally and formidably rebuilt. By the late 1860s, a section 740 feet (*c.* 225m) long had been built west of the junction of the North and East Walls for the use of 'deeply laden vessels from foreign ports with cargoes of grain and timber,' which required sixteen to eighteen feet at low water (Gilligan 1988, 129).

The new dock was planned and built and in 1872, the canal bank between Sheriff Street and the North Strand Road was developed by the company, which invested £71,961 in the new wharves and cranes (Figure 4.10). The new facility enabled coasters of up to 500 tons to discharge coal directly into railway wagons. The lord lieutenant, Earl Spencer, performed the opening ceremony on April 15, 1873 and gave his name to the wharves and sidings. That same year, the four major railway companies united to form a general railway centre at the North Wall (i.e. the MGWR, along with the Great South Western, Great Northern and the London and Northwestern Railway Company (LNWR); the LNWR had formerly operated out of Kingstown, now Dun Laoghaire). This was completed more than ten years later when the so-called Loop Line was constructed connecting Westland-Row (Pearse Street) with Amiens Street (Connolly Station).

By the time of the publication of the second edition of the Ordnance Survey in 1876 (Figure 4.10), the impact of the new railway lines and associated works can be seen in the area. To the immediate west of the proposed development site, extensive railway marshalling yards extend back from the quays, most tracks running alongside the canal and across the north inner city, with a connection along West Road to the Belfast line and a spur extending back to the area now occupied by the Point Depot. Although the

proposed development site itself remained unoccupied (except for its western edge, which encroaches slightly into the small residential terrace), the surrounding area was becoming increasingly developed. Much of the North Lotts area south of Sheriff Street housed industrial works, with various Saw Mills, a Vinegar and Charcoal Works, an 'Old Stores'.

A small island of residential terraces and a church (enclosed by the two railway lines, East Road and Sheriff Street) had been constructed immediately north of the proposed development site on the opposite side of the street. Although the church (named St Barnabas' Church on later OS edition maps) was demolished in the second half of the 20th century, its masonry foundations were uncovered during archaeological investigations of the site in 2005 (Dehaene Excavations 2005:477; Licence No. 05E0080).

Among the buildings that had been constructed along the Quay in the later 19th century were the LNWR Hotel, the Iarnród Éireann Freight Offices and the Wool Store. The hotel is depicted on the 1907 edition OS map (Figure 4.11). In 1883, increasing passenger traffic had encouraged the company to purchase the Prince of Wales Hotel on the junction of (old) Wapping Street and North Wall Quay. A new hotel was constructed behind the existing one, which was soon demolished. The new building was extended to the North Wall and renamed the Northwestern Hotel. It stands today as the Former British Rail Hotel, now Coras Iompar Éireann offices. Increased traffic also required increased storage for goods awaiting discharge or loading and new expansive Goods Sheds are depicted along the south side of North Wall Quay.

20th Century Decline

The expansion of the railway works in the late 19th century had resulted in the closure of the original Wapping Street, with New Wapping Street created further east and now aligned with the junction of East Road and Sheriff Street. The line of the street can still be seen on the 1907 edition map (and the north and south ends remain evident today), with the middle section occupied by additional long, narrow sheds. The proposed development site, which lies immediately east of the large railway works, is in use for the first time; it houses a large timber yard, one of several in the area (Figure 4.12). With the exception of a narrow L-shaped building along the north and west sides and a small structure in the centre, the rest of the plot is open yard. A small terrace of houses is depicted to the southeast of the yard, beyond the proposed development site, with another terrace on the opposite side of New Wapping Street. In the surrounding area, two of the industries named on the map are listed in the Dublin City Industrial Heritage Record, a Bonded Stores and a smithy (DCIHR 018-08-089 & 018-08-093; see Section 4.6; Figure 4.12).

The entire North Lotts area to the east of Spencer Dock is now dominated by the railway works, with a network of railway lines, sidings, goods stations and sheds. The large plots in between are almost entirely given over to industrial activities. In addition to the numerous timber yards, there is an iron works, a slate and tile yard, a coal yard and saw mills. Other structures, such as the cattle pens, post office, corn stores and tanks, are directly connected to the use of this area as a bustling transport hub in the late 19th and early 20th century.

The development of the Alexandra Basin downstream of the North Wall enabled ships of greater tonnage to discharge their cargoes at all stages of the tide, thus restricting the amount of traffic docking at the railway terminus. Coal continued to be discharged along Spencer Dock, primarily to feed the railway locomotives. The outbreak of the First World War brought renewed passenger activity to the immediate area, and the railway yards were used for troop movements. Railway workers still refer to a railway siding alongside Church Road as 'The Dardanelles.'

The political instability at the beginning of the 1920s led to the military zoning of the area, and there is much local folklore concerning IRA activity (little of it substantiated). The Northwestern Hotel on the quays, for example, seems to have been a haunt of British intelligence officers, while the tunnels connecting the passenger station and the quayside were used to surreptitiously evacuate casualties (Myles 2000). Independence saw the passenger terminal and hotel handed back to the LNWR (which had become the London, Midland and Scottish Railway Company in 1921) and the goods station returned to the MGWR, later to be amalgamated into the Great Southern Railway (GSR) Company.

As the cattle export trade grew in importance in the 1920s, the LM&S North Wall Station was converted to a freight station and cattle pens were built to the rear (on its eastern side), to the south of the proposed development site. At the site of the proposed development itself there is very little activity. The 1936 edition OS map shows that the timber yard is gone and the plot is once more almost entirely vacant, with only one small structure and a tank stand at the western plot boundary. In the surrounding area, several new factories have opened, including Castle Forbes Works (Soap) and Dublin Granaries (Corn Mill) on the north side of Sheriff Street and a Packing Case Factory and Oil Store further east along the quays. The Temple Press (Printing Works) fronting onto Mayor Street Upper c. 105m east of the proposed development, is listed in the Dublin City Industrial Heritage Record (DCIHR 018-08-090; Figure 4.13), though it is no longer extant.

4.3.7 Architectural Sites

There are no sites of architectural merit recorded on the site in the Record of Protected Structures (RPS) of the Dublin City Development Plan 2016-2022 or in the National Inventory of Architectural Heritage (NIAH). Both the RPS and the NIAH record several sites in the vicinity of the North Wall and North Lotts which relate to the industrial heritage of the docklands, and provide an attractive setting for the surrounding developments. While the majority of these features are related to the canal and docklands, the closest site of architectural merit is a Victorian period house (NIAH no.: 50010196) at 7 Mayor Street, approximately 20m from the proposed development site. The relevant sites are presented in the table below and in Figure 4.14.

Site	RPS no.	NIAH no.	Description
7 Mayor Street		50010196	Detached two-storey three-bay Victorian house, built c. 1890, bringing variation to the industrial nature of architecture in this part of the city.
Sheriff Street Lifting Bridges		50010016	Wrought and cast iron draw bridge, erected c. 1900 to cross the Royal Canal.
Scherzer Bridges	912	50010009	Pair of movable Scherzer bridges constructed c. 1935 to the patented design of William Scherzer of Chicago.
Wool Store	5837	50010013	Rubble stone early industrial building known as the 'Wool Store' and originally built c. 1850 as a port facility. It was incorporated into the North Wall Railway Station abutting the south wall elevation, with its ground floor used as stables.

Site	RPS no.	NIAH no.	Description
North Wall Railway Station	5836	50010012	Thirteen bay, two storey red brick former railway station, built c. 1900 to complete the mail service between London and Dublin. Provided transport for soldiers of the British Army in World War I. Now in use as the CIE Goods Depot.
British Rail Hotel / London & Western Hotel	5838	50010014	Detatched eight-bay four-storey red brick and terracotta former hotel, built c. 1885, on U-plan with three-storey seven bay rear wings retained from an earlier hotel, built c. 1860. It was built by the London and North Western Railway to replace the earlier hotel when the company moved its terminus from Dún Laoghaire to the North Wall Quay. Occupied by British Officers during the War of Independence, it became known as the British Railway Hotel, but ceased operating as a hotel in 1920. Now in use as the offices of Irish Rail.
Hotel Gates	5839	50010015	Cast-iron and stone wall, erected c. 1870 enclosing area to the west elevation of the former London and North Western Railway.
North Wall	5835	50010011	Stretch of quay wall, erected c. 1800 along north embankment of River Liffey between Convention Centre and New Wapping Street. Coursed squared granite ashlar quay walls with granite coping. Built to match the earlier quay walls of Sir John Rogerson's Quay.
Dublin & Glasgow Steam Packet Company	5840	50011165	Detached multiple-bay three-storey brick commercial building, built c. 1862 for the Dublin & Glasgow Steam Packet Company. Now exists as a façade with a modern building behind it.
Vallance & McGrath public house	5841	50011166	Attached two-bay three-storey house over concealed basement, built c. 1880 with pub shopfront inserted into the ground floor. The last remaining residential structure on North Wall Quay.
82 North Wall Quay	5842	50011167	Attached gable-fronted three-storey red brick warehouse, built c. 1900 as a utilitarian structure associated with the Dublin Docks.
Electricity substation		50011185	Two detached single-storey six-bay and two-bay electricity substations, built c. 1900 to power the industrial docklands area.

The North Lotts and Grand Canal Planning Scheme aims *'that the architectural and historical significance of the Docklands area is protected, conserved and enhanced'* (cf. Appendix 4.4). It specifies that,

> '*Proposals should respect the setting and visual qualities of the railway complex protected structures and provide for publicly accessible uses, active frontages and public spaces*'.

4.3.6 Industrial Heritage Sites

Three sites are identified in the Dublin City Industrial Heritage Record (DCIHR) in the vicinity of the proposed development (Figures 4.12, 4.13), only two of which are extant: a former bonded stores on Sheriff Street Upper (DCIHR Ref. 018-08-089, c. 110m east); and a former smithy on Castleforbes Road / Fish Street (DCIHR Ref. 018-08-093, c. 145m east). Neither of these structures will be affected by the proposed development.

Site	DCIHR Ref.	Description & DCIHR Appraisal
Bonded stores	018-08-089	Built c. 1880. Now in ruinous state with only the red-brick elevation surviving. Though little survives of this former bonded stores, the attractive surviving window surrounds attest to the detailing employed in the construction of what would have been a purely functional structure. It was built to serve the bustling trade of the docklands in the late 19th century and as such is significant within the industrial heritage of the local area.
Smithy	018-08-093	The former smithy is now in use as a furniture repair shop. It is a detached triple-pile multiple bay single-storey building, built c. 1880. The structure, although altered, retains much of its original form and feature, enhanced by the textural variation created by the rubble walls, cut-stone dressings and brick surrounds. Situated in the docklands area, the building's size indicates a more substantial enterprise than the typical smithy and is a memento of an age before automotive transport, when horse power was relied on for the transport of goods and people.

The third site, a former printing works on Mayor Street Upper (DCIHR 018-08-090, c. 105m east) is depicted on the 1935-6 OS map but does not survive.

4.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The Block 2 proposed development occupies the corner of Sheriff Street Upper (to the north) and New Wapping Street (to the east), on the north side of the River Liffey. The plot measures approximately 1.1 hectares, with the DART Underground Reservation Strip running along its west side.

The proposed development site lies within the North Lotts and Grand Canal Strategic Development Zone (SDZ). The SDZ was designated in 2012 and a planning scheme for the zone was published by Dublin City Council in 2014. The 66-hectare SDZ extends north and south of the River Liffey, with the proposed development site falling within the northern sector, in a strategic location adjoining the National Convention Centre and the Red Luas Line.

Development comprising of an alteration to permitted development Reg. Ref. DSDZ2896/18 and as amended by Reg. Ref. DSDZ4279/18 at Spencer Place North, City Block 2, Spencer Dock, Dublin 1. The proposed development seeks revisions to the permitted Block 1 and 2 to provide for an increase in the number of residential units from 349 no. to 464 no. apartment units and the change of use of the permitted aparthotel development to shared accommodation.

The proposed development will increase the height of the permitted development increasing the maximum height of Block 1 from 7 no. storeys (27.5 m) to a maximum height of 13 no. storeys (46.8m) and increasing the maximum height of Block 2 (27.5m) to 11 no. storeys (40.5m). The proposed

development will also include the provision of a link bridge between Block 1 and Block 2 at 6th floor level, landscaping, the provision of communal open space, revised under croft level, provision of roof terraces and all other associates site development works to facilitate the development.

This development will require deep excavations for an undercroft level and stabilisation purposes, with the potential to impact subsurface archaeological feature (including organic deposits) on the site (should they exist). Archaeological monitoring took place in advance of the planned North Lotts pumping station, an area now within the boundary of the proposed site and revealed features in the form of two clusters of horizontal brushwoods (Figure 4.2). These sites were subsequently excavated and preserved by record (McQuade 2012). These features were revealed at a depth of 1.4m OD.

The groundworks phase of works (bulk excavations) is currently being carried out as part of the permitted development (Reg. Ref. DSDZ4279/18). The works commenced in December 2018 and are expected to be finished by the end of July 2019. All of the groundworks have been monitored by an archaeologist (Rubicon Heritage Ltd) under licence number 18E0761, issued by the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht (a copy of the method statement was also forwarded to the Dublin City Archaeologist). To date, no features of archaeological significance have been encountered (Jean O'Dowd & James Hession, Rubicon Heritage Ltd, *pers. comm*.). Archaeological monitoring is ongoing and will continue until the completion of the groundworks.

4.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

4.5.1 Archaeology

There are no recorded archaeological monuments within the proposed development site. However, previous archaeological investigations in the vicinity have yielded significant results, primarily the discovery of Late Mesolithic and Middle Neolithic fish traps on the NCC / Spencer Dock development site, c. 160m southwest of the proposed development.

The archaeological potential inherent in this area was proven in 2011 when waterlogged wooden remains, of possible prehistoric date, were revealed during archaeological monitoring of bulk excavations on the northern portion of the proposed Block 2 development site, at a depth of only c. -1.4m OD (McQuade 2012, Licence No. 09E0375).

Excavation work within the southern portion of this proposed development site has the potential to reveal and directly impact waterlogged and organic archaeological deposits and features, as evidenced by the previous findings that were preserved by record within the northern boundary of the site (Figure 4.2).

4.5.2 Architecture

There are no designated architectural assets within the proposed development site. Several architectural assets related to the industrial heritage of the North Wall and Royal Canal area are recorded in the Record of Protected Structures of the Dublin City Council and in the National Inventory of Architectural Heritage survey. These structures are predominantly located along the water front of the canal and river wall, and will not be impacted by the development.

While a Victorian House is recorded by the NIAH survey 20m from the proposed development (NIAH no.: 50010196), it is not listed in the RPS of the Dublin City Council. There will be a moderate visual impact from the development to the setting of this structure. However, this change in the character of the streetscape will be mitigated by the overall positive impact of the redevelopment of the Docklands area.

4.5.3 Cultural Heritage

There are no cultural heritage assets within the proposed development site. Several structures related to the industrial heritage of the North Wall and Royal Canal area are recorded in the Record of Protected Structures of the Dublin City Council, the National Inventory of Architectural Heritage survey and the Dublin City Industrial Heritage Record. These structures will not be impacted by the development.

4.6 POTENTIAL CUMULATIVE IMPACTS

There are no anticipated cumulative impacts on archaeology should remains be revealed as a result excavation works associated with this project. If archaeological deposits and features are discovered, an analysis of their nature, extent and significance will add to the understanding and development of Spencer Dock area to date.

The development of the docklands produces a cumulative positive impact on the architecture and industrial heritage of the area, as the regeneration of the area is guided by a policy of protecting, conserving and enhancing historic structures and buildings as set out in the North Lotts and Grand Canal Dock SDZ Planning Scheme.

4.7 'DO NOTHING' IMPACT

In the "do-nothing" scenario the proposed site would not be redeveloped and therefore there would be no adverse impacts to any as yet undiscovered subsurface archaeological deposits, features or finds, nor to any features of architectural heritage, cultural heritage or historic interest.

4.8 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

The groundworks phase of works (bulk excavations) is currently being carried out as part of the permitted development (Reg. Ref. DSDZ4279/18). The works commenced in December 2018 and are expected to be finished by the end of July 2019. All of the groundworks have been monitored by an archaeologist (Rubicon Heritage Ltd) under licence number 18E0761, issued by the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht (a copy of the method statement was also forwarded to the Dublin City Archaeologist). To date, no features of archaeological significance have been encountered (Jean O'Dowd & James Hession, Rubicon Heritage Ltd, *pers. comm*.). Archaeological monitoring is ongoing and will continue until the completion of the groundworks.

No additional mitigation is required.

4.9 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

4.9.1 Archaeology

Given the possibility of subsurface archaeological material within the proposed development site, the predicted impact would comprise of a probable direct impact on archaeological material. It is not possible at this time to quantify the significance rating, due to the unknown characteristics of of any possible subsurface remains, but the excavation of prehistoric water-logged artefacts 160m from the site was found to be a significant and mitigatable discovery.

4.9.2 Architecture

There will be no direct impact to architectural heritage. There will be a moderate visual impact on an adjacent Victorian period house (NIAH no.: 50010196). However the proposed development is consistent with the emerging character of the Docklands area.

4.9.3 Cultural Heritage

There will be no impact to cultural or industrial heritage by the proposed development.

4.10 MONITORING

No post-development monitoring will be required as part of the proposed development.

4.11 REINSTATEMENT

There will be no requirement for reinstatement.

4.12 INTERACTIONS

No interactions were identified during the assessment process.

4.13 DIFFICULTIES ENCOUNTERED IN COMPILING

Archaeological monitoring of bulk excavations took place in the northern portion of the proposed development site in 2011/2012 in advance of a planned North Lotts pumping station on the site. This revealed water-logged organic remains which were fully excavated and recorded at the time (McQuade 2012, Licence No. 09E0375). However, post-excavation analysis was not completed, due to funding problems on the part of the developer (*Pers. Comm*. Eoin Halpin, ADS Ltd, June 2015). As such, dates were not procured for the site and a final report was never produced. While these investigations demonstrate the potential of the proposed development site for archaeological features or artefacts, the date and character of the probable remains are difficult to quantify.

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Online Resources

www.archaeology.ie
www.excavations.ie
www.dublincity.ie
www.osimaps.ie
www.myplan.ie
Google Earth

Chapter 5

Biodiversity

5.0 BIODIVERSITY

5.1 INTRODUCTION

This section of the EIAR has been prepared by Pádraic Fogarty of OPENFIELD Ecological Services. Pádraic Fogarty has worked for over 20 years in the environmental field and in 2007 was awarded an MSc from Sligo Institute of Technology for research into Ecological Impact Assessment (EcIA) in Ireland. OPENFIELD is a full member of the Institute of Environmental Management and Assessment (IEMA). This chapter of the EIAR has also been reviewed by Bryan Deegan (MCIEEM), Managing Director, Altemar Ltd., Marine and Environmental Consultants.

Under the EIA Directive as well as best practice methodology from the EPA, the analysis of impacts to biodiversity is an essential component of the EIA process, and so is a required chapter in any EIAR.

Under Article 6(3) of the Habitats Directive an 'appropriate assessment' of projects must be carried out to determine if significant effects are likely to arise to the integrity of Natura 2000 sites. An Appropriate Assessment Screening Report has been prepared as a separate stand-alone report.

5.2 STUDY METHODOLOGY

The assessment was carried out in accordance with the following best practice methodology: 'Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland' by the Institute of Ecology and Environmental Management (IEEM, 2016) and 'Guidelines on the information to be contained in Environmental Impact Assessment Reports by the Environmental Protection Agency (EPA, 2017).

A site visit was carried out on the 20th of September 2018 in fair weather. The site was surveyed in accordance with the Heritage Council's Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2010). Habitats were identified in accordance with Fossitt's Guide to Habitats in Ireland (Fossitt, 2000).

Since the survey was carried out on the site, the condition of the site characteristics have progressed due to the ongoing construction on the site. In this regard the site is currently clear of all features and excavation of the basement level has taken place. An updated AA Screening prepared by Altemar has been prepared and is submitted with the planning application that identifies the current position on the site as per site visit 15th August 2019.

The nomenclature for vascular plants is taken from *The New Flora of the British Isles* (Stace, 2010) and for mosses and liverworts *A Checklist and Census Catalogue of British and Irish Bryophytes* (Hill et al., 2009).

September lies within the optimal survey period for general habitat surveys (Smith et al., 2010) and it was possible to classify all habitats on the site to Fossitt level 3. September lies outside the the optimal season for surveying breeding birds, amphibians or large mammals. However, given the urban context of the site, this was not a constraint to a full ecological assessment.

5.3 EXISTING RECEIVING ENVIRONMENT

5.3.1 Zone of Influence

Best practice guidance suggests that an initial zone of influence be set at a radius of 2km for non-linear projects (IEA, 1995). However, some impacts are not limited to this distance and so sensitive receptors further from the project footprint may need to be considered as this assessment progresses. This is shown in figure 5.1.

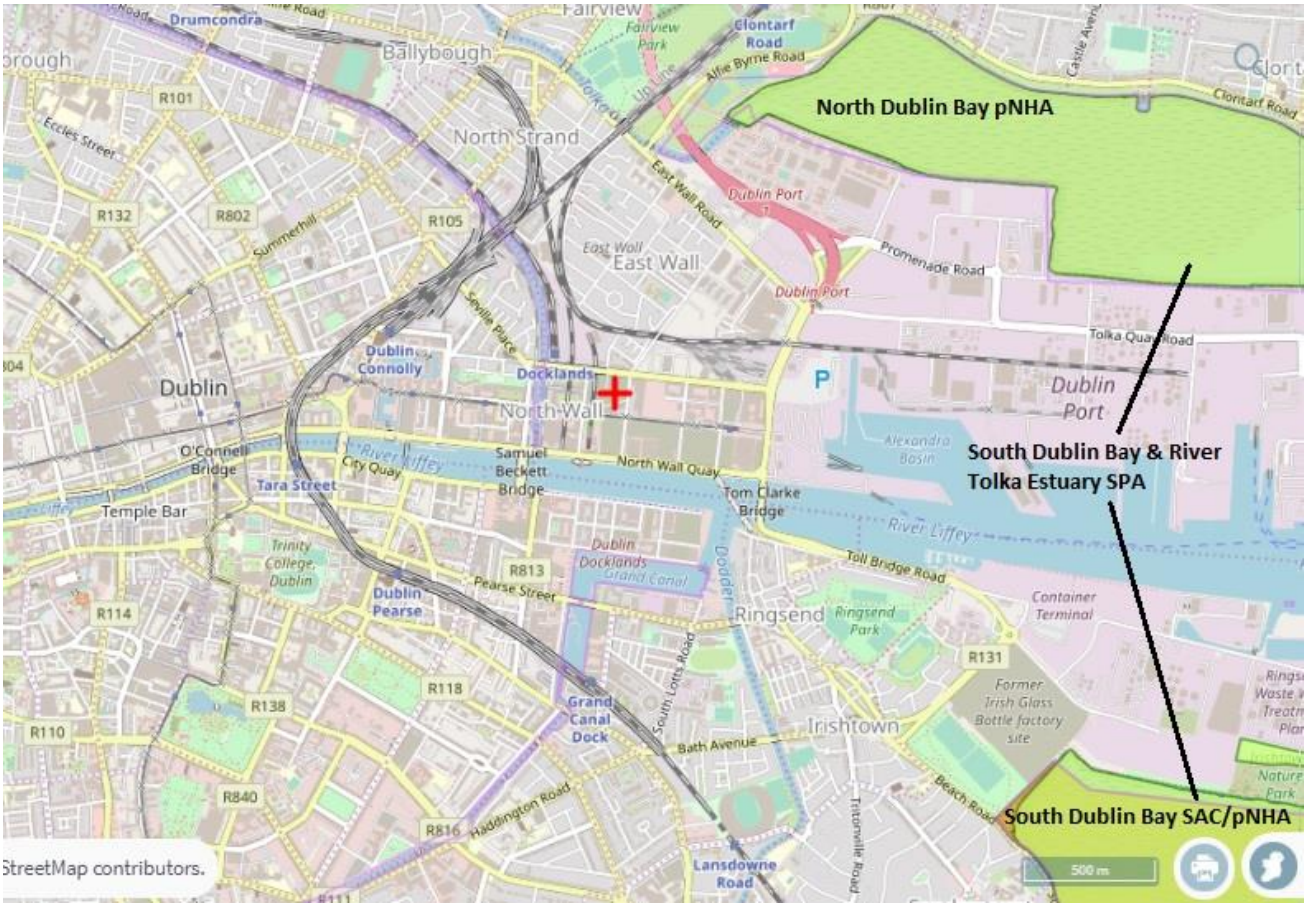

Figure 5.1 – Site location (red cross) showing nearby areas designated for nature conservation (from www.epa.ie).

There are a number of designations for nature conservation in Ireland including National Park, National Nature Reserve, RAMSAR site, UNESCO Biosphere reserves, Special Protection Areas (SPA – Birds Directive), Special Areas of Conservation (SAC – Habitats Directive); and Natural Heritage Areas. The mechanism for these designations is through national or international legislation. Proposed NHAs (pNHA) are areas that have yet to gain full legislative protection. They are generally protected through the relevant County Development Plan. There is no system in Ireland for the designation of sites at a local, or county level. The following areas were found to be located within an approximate 2km radius of the application site:

South Dublin Bay SAC (side code: 0210). It has one qualifying interest (i.e. feature which qualifies the area as being of international importance) which is mudflats and sandflats not covered by seawater at low tide.

South Dublin Bay and Tolka Estuary SPA (side code: 4024) is concentrated on the intertidal area of Sandymount Strand, to the south of the city, as well as the Tolka Estuary. The North Bull Island SPA (site code: 0206) is largely coincident with the North Dublin Bay SAC with the exception of the terrestrial portion of Bull Island. Table 2 lists the features of interest for these SPAs.

Bird counts form BirdWatch Ireland are taken from Dublin Bay as a whole and are not separated between the two SPAs in this area.

Dublin Bay is recognised as an internationally important site for water birds as it supports over 20,000 individuals. Table 1 shows the most recent count data available (Lewis et al., 2016).

Table 1 – Annual count data for Dublin Bay from the Irish Wetland Birds Survey (IWeBS)

Year	2010/11	2011/12	2012/13	2013/14	2014/15	Mean
Count	27,931	30,725	30,021	35,878	33,486	31,608

There were also internationally important populations of particular birds recorded in Dublin Bay (i.e. over 1% of the world population): Light-bellied brent geese *Branta bernicula hrota*; Black-tailed godwit *Limosa limosa*; Knot *Calidris canutus* and Bar-tailed godwit *L. lapponica*.

Table 2 – Features of interest for the South Dublin Bay and Tolka Estuary SPAs in Dublin Bay (EU code in square parenthesis)

Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]
Oystercatcher (*Haematopus ostralegus*) [A130]
Ringed Plover (*Charadrius hiaticula*) [A137]
Grey Plover (*Pluvialis squatarola*) [A140]
Knot (*Calidris canutus*) [A143]
Sanderling (*Calidris alba*) [A144]
Dunlin (*Calidris alpina*) [A149]
Bar-tailed Godwit (*Limosa lapponica*) [A157]
Redshank (*Tringa totanus*) [A162]
Black-headed Gull (*Croicocephalus ridibundus*) [A179]
Roseate Tern (*Sterna dougallii*) [A192]
Common Tern (*Sterna hirundo*) [A193]
Arctic Tern (*Sterna paradisaea*) [A194]
Wetlands & Waterbirds [A999]

South and North Dublin Bay pNHA (site code: 0206 and 0210). In both cases these areas are coincident with an SAC or SPA designation which would supersede this older designation.

The NPWS web site (www.npws.ie) contains a mapping tool that indicates historic records of legally protected species within a selected Ordnance Survey (OS) 10km grid square. The Spencer Dock site is located within the square O22 and six species of protected flowering plant are highlighted. These species are detailed in Table 3. It must be noted that this list cannot be seen as exhaustive as suitable habitat may be available for other important and protected species.

Table 3 – Known records for protected species within the O22 10km square

Species	Habitat[1]	Current status[2]
Cinopodium acinos Basil Thyme	Field margins and sandy or gravelly places	Record pre-1970
Galeopsis angustifolia Red Hemp-nettle	Calcareous gravels	
Puccinellia fasciculata Borrer's salt-marsh grass	Muddy inlets on the coast	
Misopates orontium Lesser Snapdragon	Arable fields	
Viola hirta Hairy Violet	Sand dunes, grasslands, limestone rocks	
Cervus nippon Sika Deer	Coniferous woodland and adjacent heaths	Current
Lutra lutra Otter	Rivers, coasts and wetlands	Current
Sciurus vulgaris Red Squirrel	Woodlands	Current

In summary, it can be seen that of the five species none remains current according to the Botanical Society of the British Isles.

Water quality in rivers, canals and estuaries is monitored on an on-going basis by the Environmental Protection Agency (EPA). The subject lands are in the catchment of the River Liffey, which can be found approximately 190m to the south. The river is tidally influenced in this location. The EPA have assessed this transitional water under the Water Framework Directive as 'moderate'. These data are taken from the ENVision mapping tool on www.epa.ie.

5.3.2 Stakeholder Consultation

Because of the low ecological sensitivity of the subject site, third party consultation was not carried out.

5.3.4 Site Survey

Aerial photography from the OSI and historic mapping shows that this area has long been a part of the built environment of Dublin City. The site itself has vacant for some years. The immediate vicinity is entirely composed of buildings and artificial surfaces and areas of open green space or clusters of mature trees are not present with 100m.

5.3.4.1 Flora

At the time of the site visit, September 2018 the subject site is entirely composed of **buildings and artificial surfaces – BL3** which comprises asphalt surfaces. Where vegetation is present it is ruderal in nature, with non-native species such as Butterfly-bush *Buddleja davidii* and Canadian Fleabane *Conyza canadiensis,* or native annuals such as Daisy *Bellis perennis,* saplings of Grey Willow *Salix cinerea* and Ragwort *Scenacio jacobaea.* It is a habitat of negligible biodiversity value.

[1] Parnell et al., 2012
[2] www.bsbi.com

No plants listed as alien invasive under Schedule 3 of SI No. 477 of 2011 are growing on the site.

The subject site has since been cleared and construction has commenced on site under Reg. Ref. DSDZ2896/18 as amended by Reg. Ref. DSDZ4279/18 therefore all existing habitats have been removed.

5.3.4.2 Fauna

The site survey in September 2018, included incidental sightings or proxy signs (prints, scats etc.) of faunal activity, while the presence of certain species can be concluded where there is suitable habitat within the known range of that species. Table 5.4 details those mammals that are protected under national or international legislation in Ireland. Cells are greyed out where suitable habitat is not present or species are outside the range of the study area.

Table 5.4 – Protected mammals in Ireland and their known status within the O22 10km grid square[3]. Those that are greyed out indicate either that there are no records of the species from the National Biodiversity Data Centre. Since the site is not coastal the two Seal species are greyed out.

Species	**Level of Protection**	**Habitat[4]**
Otter *Lutra lutra*	Annex II & IV Habitats Directive; Wildlife (Amendment) Act, 2000	Rivers and wetlands
Lesser horseshoe bat *Rhinolophus hipposideros*		Disused, undisturbed old buildings, caves and mines
Grey seal *Halichoerus grypus*	Annex II & V Habitats Directive; Wildlife (Amendment) Act, 2000	Coastal habitats
Common seal *Phocaena phocaena*		
Whiskered bat *Myotis mystacinus*	Annex IV Habitats Directive; Wildlife (Amendment) Act, 2000	Gardens, parks and riparian habitats
Natterer's bat *Myotis nattereri*		Woodland
Leisler's bat *Nyctalus leisleri*		Open areas roosting in attics
Brown long-eared bat *Plecotus auritus*		Woodland
Common pipistrelle *Pipistrellus pipistrellus*		Farmland, woodland and urban areas
Soprano pipistrelle *Pipistrellus pygmaeus*		Rivers, lakes & riparian woodland
Daubenton's bat *Myotis daubentoniid*		Woodlands and bridges associated with open water
Nathusius' pipistrelle *Pipistrellus nathusii*		Parkland, mixed and pine forests, riparian habitats

[3] From the National Biodiversity Data Centre, excludes marine cetaceans
[4] Harris & Yalden, 2008

Irish hare *Lepus timidus hibernicus*	Annex V Habitats Directive; Wildlife (Amendment) Act, 2000	Wide range of habitats
Pine Marten *Martes martes*		Broad-leaved and coniferous forest
Hedgehog *Erinaceus europaeus*	Wildlife (Amendment) Act, 2000	Woodlands and hedgerows
Pygmy shrew *Sorex minutus*		Woodlands, heathland, and wetlands
Red squirrel *Sciurus vulgaris*		Woodlands
Irish stoat *Mustela erminea hibernica*		Wide range of habitats
Badger *Meles meles*		Farmland, woodland and urban areas
Red deer *Cervus elaphus*		Woodland and open moorland
Fallow deer *Dama dama*		Mixed woodland but feeding in open habitat
Sika deer *Cervus nippon*		Coniferous woodland and adjacent heaths

Although a number of mammals are known to be present in Dublin city, most notably Fox *Vulpes vulpes,* there are no habitats on the site which are suitable for the majority of these species. There are no buildings or old trees which are suitable for roosting bats. The lack of semi-natural vegetation in the immediate vicinity of the site is considered to be a significant limiting factor in this location and so a detector-based survey was not carried out (Hundt, 2013). For this reason, and given the ongoing construction activities on the site, a dedicated bat survey is not considered necessary and was not carried out for this study.

No birds were recorded during the site survey and habitats are of minimal value for nesting birds (although nesting cannot be ruled out).

There are no suitable habitats on the site for amphibians or fish. There are no water courses on the site while habitats between the site and the River Liffey are entirely artificial in nature, including the banks of the river itself.

Most habitats, even highly altered ones, are likely to harbour a wide diversity of invertebrates. In Ireland only one insect is protected by law, the Marsh Fritillary butterfly *Euphydryas aurinia,* and this is not to be found on built-up sites. Other protected invertebrates are confined to freshwater and wetland habitats and so are not present on this site.

It should also be noted that since the site survey was carried out, the site characteristic have changed as a result of the ongoing construction on the site. In August 2019 no habitat or species of conservation importance were present on the site.

5.3.5 Overall Evaluation of the Context, Character, Significance and Sensitivity of the Proposed Development Site

In summary it has been seen that the application site is within a built-up area of Dublin City and works ae currently ongoing on the site. There are no examples of habitats listed on Annex I of the Habitats Directive or records of rare or protected plants. There are no species listed as alien invasive as per SI 477 of 2011.

Significance criteria are available from guidance published by the National Roads Authority (NRA, 2009). These are reproduced in table 5.5. From this an evaluation of the various habitats and ecological features on the site has been made and this is shown in table 5.6.

Table 5.5 Site evaluation scheme taken from NRA guidance 2009

Site Rating	***Qualifying criteria***
A - International importance	SAC, SPA or site qualifying as such. Sites containing 'best examples' of Annex I priority habitats (Habitats Directive). Resident or regularly occurring populations of species listed under Annex II (Habitats Directive); Annex I (Birds Directive); the Bonn or Berne Conventions. RAMSAR site; UNESCO biosphere reserve; Designated Salmonid water
B - National importance	NHA. Statutory Nature Reserves. Refuge for Flora and Fauna. National Park. Resident or regularly occurring populations of species listed in the Wildlife Act or Red Data List 'Viable' examples of habitats listed in Annex I of the Habitats Directive
C - County importance	Area of Special Amenity, Tree Protection Orders, high amenity (designated under a County Development Plan) Resident or regularly occurring populations (important at a county level, defined as >1% of the county population) of European, Wildlife Act or Red Data Book species Sites containing semi-natural habitat types with high biodiversity in a county context, and a high degree of naturalness, or populations of species that are uncommon in the county
D - Local importance, higher value	Sites containing semi-natural habitat types with high biodiversity in a county context, and a high degree of naturalness, or populations of species that are uncommon in the locality Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
E - Local importance, lower value	Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; Sites or features containing non-native species that are of some importance in maintaining habitat links.

Table 5.6 Evaluation of the importance of habitats and species on the site

Buildings and artificial surfaces – BL3	Negligible ecological value

5.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposal is described thus, as per the planning application

Development comprising of an alteration to permitted development Reg. Ref. DSDZ2896/18 and as amended by Reg. Ref. DSDZ4279/18 at Spencer Place North, City Block 2, Spencer Dock, Dublin 1. The proposed development seeks revisions to the permitted Block 1 and 2 to provide for an increase in the number of residential units from 349 no. to 464 no. apartment units and the change of use of the permitted aparthotel development to shared accommodation.

The proposed development will increase the height of the permitted development increasing the maximum height of Block 1 from 7 no. storeys (27.5 m) to a maximum height of 13 no. storeys (46.8m) and increasing the maximum height of Block 2 (27.5m) to 11 no. storeys (40.5m). The proposed development will also include the provision of a link bridge between Block 1 and Block 2 at 6th floor level, landscaping, the provision of communal open space, revised under croft level, provision of roof terraces and all other associates site development works to facilitate the development.

The development will result in the loss of no semi-natural habitat.

Connections to foul and surface water drainage already exist.

Figure 5.2 – Development layout

5.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

This section provides a description of the potential impacts that the proposed development may have on biodiversity in the absence of mitigation. Table 3.3 of the EPA guidance note sets out the criteria for determining the significance of impacts. This based on the valuation of the ecological feature in question and the scale of the predicted impact. In this way it is possible to assign an impact significance in a transparent and objective way. Table 5.8 summaries the nature of the predicted impacts.

5.5.1 Construction Phase

The following potential impacts are likely to occur during the construction phase in the absence of mitigation:

1. The removal of artificial surface habitats.

All existing habitats on the site have been removed as a result of ongoing construction works on site. However as per the site visit, September 2018, pre construction, the habitat present was of negligible biodiversity value and species are predominantly non-native or common and widespread.

2. The direct mortality of species during demolition.

The removal of vegetation may result in the loss of birds' nests. All birds' nests and eggs are protected under the Wildlife Act.

As the site is however currently under construction there were no bird nests and eggs present on the site.

3. Pollution of water courses through the ingress of silt, oils and other toxic substances.

The distance of the site from the River Liffey means that there is a buffer between potential pollution sources and this sensitive receptor. However, sediment is not a pollutant in coastal areas in the way it is in rivers (and where sediment can spoil fish spawning habitat). Estuaries and intertidal habitats, on the other hand, depend upon large quantities of sediment for the function and structure.

A Hydrological and Hydrogeological Qualitative Risk Assessment was prepared by AWN Consulting. This assessment states that there is no direct source-pathway linkage between the proposed development site and open water (Dublin Bay).

Operation Phase

The following potential impacts are likely to occur during the operation phase in the absence of mitigation:

4. Pollution of water from foul wastewater arising from the development.

Wastewater will be sent to the municipal treatment plant at Ringsend. Upgrade works are needed as the plant is not currently meeting its requirements under the Urban Wastewater Treatment Directive. Pollution effects are most acute in freshwater systems where the capacity for dilution is low and the consequent risk of eutrophication is high. The Ringsend WWTP discharges into Dublin Bay which is currently classified as 'unpolluted' by the EPA despite long-running compliance issues at the plant. There is currently no evidence that non-compliance issues at the WWTP are having negative effects to features of high ecological value (e.g. wading birds or intertidal habitats). In April 2019 Irish Water was granted planning permission to upgrade the Ringsend plant. This will see improved treatment standards and will increase network capacity by 50%, with a target completion date of 2023.

The AWN Hydrological and Hydrogeological assessment prepared by AWN also confirms that there is no known impact from the additional discharge from the proposed development through the combined public (foul and stormwater) sewer network which could result in any change to the current water regime (water quality or quantity).

"*There is no direct Source- Pathway between the proposed development site and open water (Dublin Bay). It is concluded that there is also no impact from the additional discharge from the proposed development through the combined public (foul and stormwater) sewer network which could result in any change to the current water regime (water quality or quantity)".*

5. Pollution of water from surface water run-off.

The Greater Dublin Strategic Drainage Study (2005) identified issues of urban expansion leading to an increased risk of flooding in the city and a deterioration of water quality. This arises where soil and natural vegetation, which is permeable to rainwater and slows its flow, is replaced with impermeable hard surfaces. The site is currently entirely of hard standing and the proposed residential extension cannot affect the quantity or quality of surface water run-off. The introduction of SUDS methods will enhance the run-off characteristics from this site.

6. Impacts to protected areas.

No impacts are predicted to Natura 2000 areas (SACs or SPAs) in Dublin Bay, principally due to the separation distance between the site and these areas. A full assessment of potential effects to these areas is contained within a separate Screening Report for Appropriate Assessment.

Table 5.7: Nature of predicted impacts in the absence of mitigation

Impact		**Direct/ Indirect**	**Cumulative**	**Duration[5]**	**Reversible?**	**Positive/ Negative**
Construction Phase						
1	Habitat loss	Direct	No	Permanent	No	Neutral
2	Species Mortality	Direct	No	Permanent	No	Moderate negative
3	Pollution of water courses	Indirect	Yes	Temporary	Yes	Negative
Operation Phase						
4	Wastewater	Indirect	Yes	Permanent	Yes	Negative
5	Surface water run-off	Indirect	Yes	Permanent	Yes	Positive

Table 5.8 below assesses the scale and likelihood of the predicted impacts of the proposed development in the absence of mitigation.

Table 5.8 – Scale and likelihood of predicted impacts in the absence of mitigation

Impact	**Magnitude**	**As proportion of resource**	**Likelihood**
Construction Phase			

5 Temporary: up to 1 year; Short-term: 1-7 years; Medium-term: 7-15 years; Long-term: 15-60 years; Permanent: >60 years (NRA, 2006)

1	Habitat loss	No loss of semi-natural habitat	-	Certain
2	Mortality to animals during construction	May impact nesting birds	-	Possible
3	Pollution of water	Not possible to quantity	Could impact downstream stretch of the River Liffey	Unlikely given barriers to flow between the site and the river
Operation Phase				
4	Wastewater pollution	Not possible to quantify	N/A	Unlikely given existing and future treatment facilities at Ringsend
5	Surface water pollution	Not possible to quantify	N/A	Likely improvement given proposed attenuation measures

Tables 5.7 and 5.8 are combined to determine the level of significance of any given impact. This is shown in table 5.9.

Table 5.9: Significance level of likely impacts in the absence of mitigation

Impact		Significance
Construction phase		
1	Loss of habitat	Imperceptible
2	Mortality to animals during construction	Significant
3	Pollution of water during construction phase	Imperceptible – no impacts are likely
4	Wastewater pollution	Imperceptible
5	Surface water pollution	Slight

Overall it can be seen that one potential significant impact is predicted to occur as a result of this project in the absence of mitigation.

5.5.2 Cumulative impacts

A number of the identified impacts can also act cumulatively with other impacts from similar developments in this area of Dublin. These primarily arise through the additional loading to the Ringsend Wastewater Treatment Plant. It is considered that this effect is not significant due to the planned upgrading works that will bring it in line with the requirement of the Urban Wastewater Treatment Directive.

In this instance the incorporation of SUDS attenuation measures into a brown-field site is contributing to the cumulative positive effective of reducing rainwater run off to the municipal treatment plant.

There are no other effects which could act in a cumulative way to result in significant impacts to flora and fauna.

5.6 DO NOTHING IMPACT

The site can be considered to have minimal ecological value. This will not change in the absence of this project.

Water quality may improve throughout the Liffey/Tolka/Dodder catchments with the implementation of the Water Framework Directive however its target of 'good ecological status' for all water bodies by 2015 was not met. In 2018 a second River Basin Management Plan was published which highlights 190 'priority areas for action' where resources will be focussed during the 2018-2021 period. The Tolka and Dodder, as well as the upper Liffey are among those areas where improvements are expected.

5.7 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

These measures include avoidance, reduction and constructive mitigation measures as set out in Section 4.7 of the Development Management Guidelines. Under the EIA Directive, where significant negative effects are predicted to arise from a project then mitigation measures are required.

This report has identified one impact that was assessed as significant and therefore mitigation is required.

5.7.1 Mitigation to protect nesting birds.

No vegetation should be cleared during the bird nesting season, which can be assumed to last from March to July inclusive. Where this is not possible, vegetation must first be inspected by a suitably qualified ecologist. Where no nesting is observed, vegetation can be removed within 48 hours. Where there is nesting, this can only be disturbed under licence from the NPWS.

5.8 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

This section allows for a qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term permanent, temporary, positive and negative effects as well as impact interactions which the proposed development may have, assuming all mitigation measures are fully and successfully applied.

No negative effects to biodiversity are predicted to arise from this project. While there are sensitive ecological receptors within the zone of influence (i.e. protected areas in Dublin Bay) there are no aspects of the project which could result in significant negative impacts.

This is further confirmed in the AWN Hydrological and Hydrogeological Assessment submitted with the application which states the following:

"A conceptual site model (CSM) has been prepared following a desk top review of the site and surrounding environs. Based on this CSM, plausible Source-Pathway- Receptor linkages have been assessed assuming an absence of any mitigation measures intended to avoid or reduce harmful effects of the proposed project (i.e. mitigation measures) in place at the proposed development site.

There is no direct Source- Pathway between the proposed development site and open water (Dublin Bay). It is concluded that there is also no impact from the additional discharge from the proposed development through

the combined public (foul and stormwater) sewer network which could result in any change to the current water regime (water quality or quantity).

Finally, and in line with good practice, appropriate and effective mitigation measures have been included in the construction design, management of construction programme and during the operational phase of the proposed development. These specific measures will provide further protection to the receiving soil and water environments. However, the protection of downstream European sites is in no way reliant on these measures".

5.9 MONITORING

Monitoring is required where the success of mitigation measures is uncertain or where residual impacts may in themselves be significant.

No further monitoring is required.

5.10 REINSTATEMENT

No reinstatement works are required for ecological features.

5.11 INTERACTIONS

This section provides a description of impact interactions together with potential indirect, secondary and cumulative impacts

The key environmental interaction with Biodiversity is Water. A series of mitigation measures are proposed in Chapter 8 – Water of this EIAR document to ensure the quality (pollution and sedimentation) and quantity (surface run-off and flooding) is of an appropriate standard.

5.12 DIFFICULTIES ENCOUNTERED IN COMPILING

This section provides and indication of any difficulties encounters by the environmental specialist in compiling the required information.

Because of the artificial nature of the habitats on this site, no difficulties were encountered in carrying out this assessment.

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Chapter 6

Landscape & Visual Impact

6.0 LANDSCAPE & VISUAL IMPACT

6.1 INTRODUCTION

This chapter assesses the landscape and visual impacts likely to arise from the proposed amendments to the scheme permitted by Dublin City Council Ref. DSDZ2896/18 as amended by Ref. DSDZ4279/18, located at Spencer Dock City Block 2, Dublin 1.

Landscape and visual impact assessment addresses two separate but closely related aspects: the first is visual impacts focusing on the extent to which new development can be seen, potential loss of existing site features and the introduction of new site features; the second aspect is impact on the landscape's character, the changes development will bring to the landscape, the impact of those changes upon nearby views, and the perception and responses that are felt towards the combined effects of the new development.

This latter topic is complex because it encompasses many other environmental topics such as ecology, archaeology and architectural history and because attempts to scientifically measure feelings and perceptions are not universally reliable.

This chapter has been prepared by Chris Kennett CMLI, director of Kennett Consulting Limited.

6.2 STUDY METHODOLOGY

This chapter has been prepared with reference to the guidance outlined in the Environmental Protection Agency (EPA) publication "Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports" (EIAR) (2017) and the current "Advice Notes on Current Practice in the Preparation of Environmental Impact Statements" (2003). Consideration is also given to the Guidelines for Landscape and Visual Impact Assessment, Third Edition (Landscape Institute and institute of Environmental Management and Assessment, 2013).

An initial desk study has been undertaken to establish an understanding of the site and surroundings, its planning context and to make an initial assessment of the likely visual envelope i.e. areas from which the site might be seen.

The potential impact of development on the landscape has been assessed with reference to the following landscape factors:

- Context: This is a factual description of the site and its surroundings.
- Character: This identifies one or more distinct landscape units within the site and/or its surroundings and outlines the defining features of each landscape.
- Significance: This is based on whether part of the local landscape been designated as 'high amenity' or something similar; is a scarce or unique landscape; or whether it is 'ordinary' or even 'derelict'.
- Vulnerability: Landscapes vary in their sensitivity change and development. This examines existing pressures for change and the damage likely to arise from such change.

Potential changes in character, visibility and land use patterns have been considered first, including indirect, secondary and cumulative impacts. This has given direction to proposed mitigation measures, which have been discussed with the project design team and incorporated into the development proposal; the subsequent assessment of likely landscape and visual impacts takes account of the proposed mitigation measures.

Mitigating potential impacts on the landscape may include one or more of the following:

- Avoid, reduce or minimise development in sensitive or prominent landscapes
- Avoid, reduce or minimise visually intrusive projects
- Reduce and minimise the visibility of the project, avoid insensitive design
- Add value or character to a landscape as part of the proposed development

Terminology includes the following terms:

- 'Visual Intrusion': a proposed development may feature within in an existing view.
- 'Visual Obstruction': a proposed development may partly or completely obscure an existing view.

The degree of impact is described using the following scale:

- 'None': No material change to the landscape or view arises from the development.
- 'Imperceptible': Change is immeasurable with no bearing on a landscape or view.
- 'Low' (or 'Slight'): Measurable but insignificant change to the landscape or view.
- 'Moderate': Measurable change to the nature of a landscape or view.
- 'High' (or 'Significant'): Substantial change occurs to the landscape or view.
- 'Profound': The character or content of a view changes completely.

The nature of an impact is described in one of three ways:

- 'Neutral' impacts neither enhance nor detract from the landscape.
- 'Positive' impacts improve or enhance the existing landscape.
- 'Negative' impacts detract from the existing landscape.

The duration of an impact is described according to the following scale:

- 'Temporary': 1 year or less
- 'Short-term': 1-7 years
- 'Medium-term': 7-20 years
- 'Long-term': 20-50 years
- 'Permanent': 50+ years

The significance of impacts on the landscape depends on a broad range of objective factors as outlined above, but can also depend on more subjective value judgements about 'good design' and how much changes will matter.

6.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

6.3.1 CHARACTER

The proposed development site comprises a vacant plot occupying the eastern half of City Block 2 in the North Lotts & Grand Canal Strategic Development Zone. It is part of a wider area within the Dublin Docklands North character area that has witnessed significant change in the last twenty years. It is a modern and changing urban fabric with recent and emerging contemporary buildings accompanied by derelict and vacant city blocks.

The application site forms the north-eastern quarter of a larger city block identified as Block 2 in the North Lotts and Grand Canal Dock Planning Scheme. The Block Numbers Plan contained in the SDZ Scheme (annotated below) usefully illustrates the site in its wider SDZ context.

Fig. 6.1: SDZ Scheme – Block Numbers. The proposed development site is highlighted (source: North Lotts & Grand Canal SDZ Planning Scheme, Figure 30A)

Fig.6.2: The site (highlighted) and its immediate surroundings, viewed from the southeast (source: Google Maps 3D)

City Block 1 to the west comprises modern high-density apartments up to ten storeys high; to the southwest lies Block 6 comprising the Convention Centre Dublin (CCD) and the PWC building, the latter extending to eight commercial storeys. These, along with the new linear park at Spencer Dock itself, comprise the principal elements (so far) of the new Spencer Dock hub and make a mostly positive contribution to the urban fabric of this city quarter.

To the south of the site lies City Block 7, part occupied by historic buildings (Protected Structures) comprising the former London and North Western Hotel, the former North Wall Quay Station and the former Woolstore, but otherwise is vacant and used as a temporary car park. A mix of commercial and residential development has been permitted on this site and is currently under construction. The historic buildings make a significant positive contribution to the character of this City Block and the River Liffey waterfront. However, the vacant nature of the remainder of the site detracts from the urban character and quality of the Spencer Dock hub.

To the southeast of City Block 2 lies City Block 8 with the now completed Central Bank of Ireland building; other buildings are currently under construction within this block.

West of Block 2 lies City Block 3 which has the North Bank Apartments development at its north-eastern corner. It is otherwise currently vacant with derelict industrial units (single storey) fronting Sheriff Street Upper and the northern portion of New Wapping Street, though a mix of office and residential development has been permitted here. There are also terraces of Victorian houses 2-3 storeys high fronting onto New Wapping Street. The Victorian houses make a positive contribution to local urban character while the vacant and derelict lands behind them are to the detriment of the urban character and quality of the Spencer Dock hub.

While City Blocks 1-3 and 6-8 comprise the Spencer Dock hub, further blocks to the east comprise the Point Village hub. The northern City Blocks 4 and 5 are mostly developed, while City Block 9 lies mostly vacant/derelict at present. City Block 10 contains the Three Arena and Point Square, where the Exo building is currently under construction.

Beyond Sheriff Street Upper lies the somewhat different urban landscape of East Wall. In the first instance this comprises long-established pockets of industrial uses and former railway yards immediately north of Sheriff Street Upper, which then give way to the wider residential area characterised by mainly two-storey terraced houses with pockets of modern apartment development.

Good public transport connectivity is provided by the LUAS and future DART Underground at Station Square. The LUAS here connects the city centre and the entertainment hub of the Point Village.

6.3.2 VISIBILITY

The existing site is well-contained visually - views of the existing site are most readily obtained from adjoining and nearby streets. Sheriff Street Upper defines the site's northern site boundary with partial views extending in both directions. Similarly, New Wapping Street defines the site's eastern boundary with partial views extending to North Wall Quay and beyond. Mayor Street Upper defines the site's southern boundary and affords partial views on both directions, which is also the route of the LUAS.

In addition, there are glimpses of the site from immediately north along East Road – due to its angle of approach to Sheriff Street Upper, it is directly aligned with the site. Occasional glimpses towards the site occur within other parts of East Wall.

Most views towards the proposed development site are public views from the streets and nearby open spaces. Key private views will be from the residential properties on New Wapping Street adjoining the site's eastern boundary, and from the modern Spencer Dock apartments at City Block 1, overlooking the site from the west.

The surrounding derelict/vacant City Blocks allow a significant degree of visual permeability through the Spencer Dock hub towards the proposed development site, notably from the south and southeast, though views will become heavily restricted in the future as each of these blocks is developed. At present, some such views also occur from south of the River Liffey, aided by the open panoramas across the river and vistas along the river.

Existing views from a range of vantage points described here can be found in the Photomontage Booklets prepared by Visual Labs. The photomontages themselves are discussed later in this chapter.

6.3.3 PLANNING CONTEXT

Dublin City Development Plan 2016-2022

The Dublin City Development Plan 2016-2022 provides the initial planning context for the site.

While the site itself falls into SDRA 6, relevant context includes the Conservation Areas along the Royal Canal / Spencer Dock and the River Liffey quays (nearby to the west and south of the site), and pockets of residential conservation areas (zoned Z2) amongst the wider residential areas (Z1) to the north and west of the SDRA.

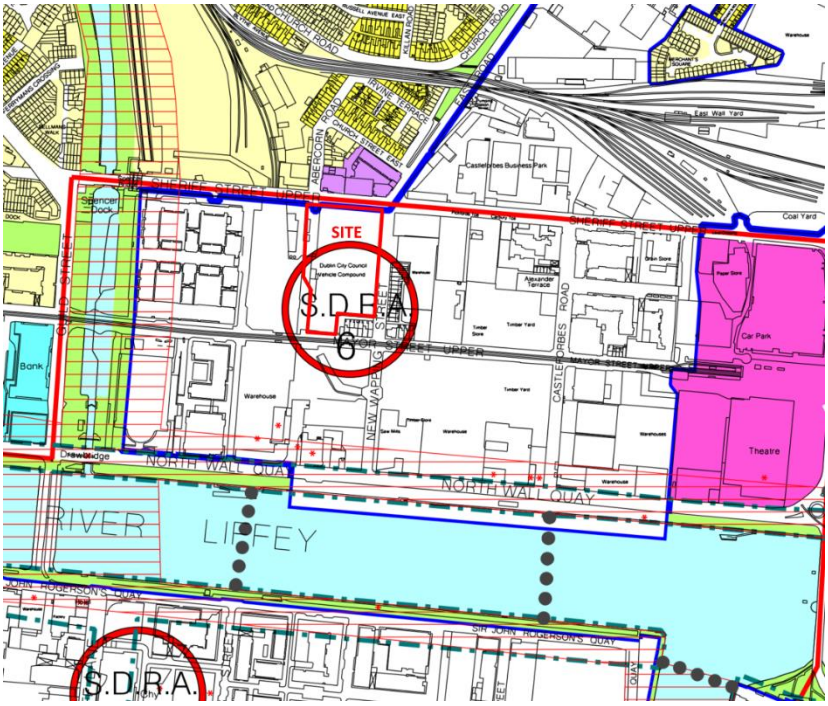


Fig.6.3: Dublin City Development Plan 2016-2022, Map E (extract)

Chapter 4 of the Development Plan addresses the Structure and Shape of the city, containing the following key policies and objectives concerning the impact of development on the character and visual amenity of the city.

Policy SC5: "to promote the urban design and architectural principles set out in Chapter 15, and in the Dublin City Public Realm Strategy 2012, in order to achieve equality, compact, well-connected city."

Policy SC25: "to promote development which incorporates exemplary standards of high-quality, sustainable and inclusive urban design, urban form and architecture befitting the city's environment and heritage and its diverse range of locally distinctive neighbourhoods, such that they positively contribute to the city's built and natural environments. This relates to the design quality of general development across the city, with the aim of achieving excellence in the ordinary, and which includes the creation of new landmarks and public spaces where appropriate."

Policy SC7: "to protect and enhance important views and view corridors into, out of and within the city, and to protect existing landmarks and their prominence."

Consideration has been given to whether the site, and the proposed development, might fall into any of the designated Key Views, indicated in the figure below. It is considered unlikely that the proposed development will feature in these views.

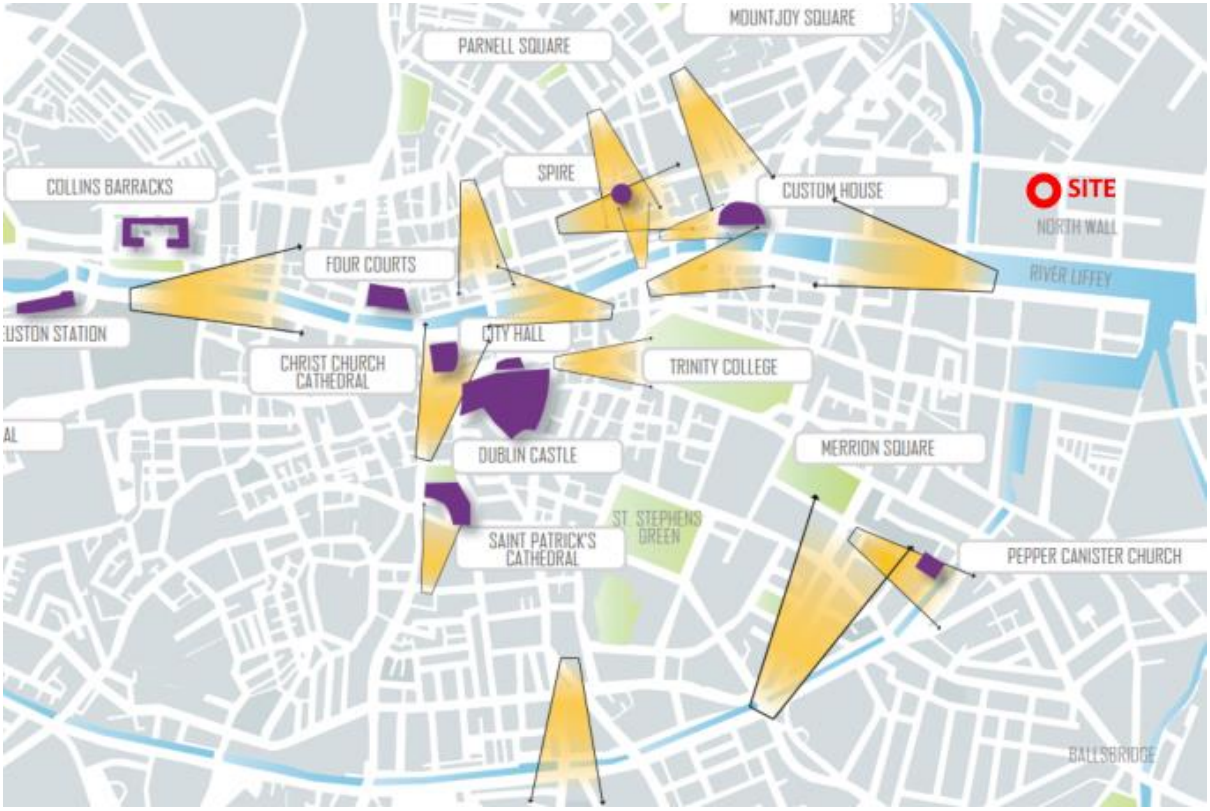


Fig.6.4: Dublin City Development Plan 2016-2022, Figure 4 (extract): Key Views and Prospects.

Policy SC28: "To promote understanding of the city's historical architectural character to facilitate new development which is in harmony with the city's historical spaces and structures."

Chapter 11 addresses culture and heritage, including Protected Structures and Conservation Areas. Policy CHC4 seeks: "To protect the special interest and character of all Dublin's Conservation Areas (11.1.5.4). Development within or affecting all conservation areas will contribute positively to the character and distinctiveness; and take opportunities to protect and enhance the character and appearance of the area and its setting, wherever possible. Development will not ... harm the setting of a conservation area [or] constitute a visually obtrusive or dominant form."

The site does not lie within or adjoin any Conservation Areas, though these lie to the west and south along the Royal Canal and River Liffey.

Chapter 16 addresses development standards and states:

"In the appropriate context, imaginative contemporary architecture is encouraged, provided that it respects Dublin's heritage and local distinctiveness and enriches its city environment. Through its design, use of materials and finishes, development will make a positive contribution to the townscape and urban realm, and to its environmental performance. In particular, development will respond creatively to and respect and enhance its context, and have regard to:

1. The character of adjacent buildings, the spaces around and between them and the character and appearance of the local area and the need to provide appropriate enclosure to streets.
2. The character, scale and pattern of historic streets, squares, lanes, mews and passageways
3. Existing materials, detailing, building lines, scale, orientation, height and massing, plot width
4. The form, character and ecological value of parks, gardens and open spaces, and
5. Dublin's riverside and canal-side settings."

With regard to respecting and enhancing character and context, chapter 16 states:

"The City Council will seek to ensure that the design of new development respects and enhances these and other elements that contribute positively to the cityscape and urban realm, the settings of protected structures, areas of special interest and important views and that such design incorporates high-quality detail, materials and craftsmanship. Design must also recognise the diversity of the city environment and respond to the distinctiveness of Dublin as a capital city, a diverse residential community and a centre of business and commerce.

"In assessing new development, consideration will be given to how the design has responded to the existing context and its relationship to the established pattern, form(s), density and scale of surrounding townscape, taking account of existing rhythms, proportion, symmetries, solid to void relationships, degree of uniformity and the composition of elevations, roofs and building lines."

Finally, with regard to building height in a sustainable city, Chapter 16 states:

"Dublin City Council acknowledges the intrinsic quality of Dublin as a low-rise city and it is policy that it should predominantly remain so. There is a recognised need to protect conservation areas and the architectural character of existing buildings, streets and spaces of artistic, civic or historic importance."

It is important to protect and enhance the skyline of the inner city and to ensure that any proposals for high buildings make a positive contribution to the urban character of the city, and create opportunities for place-making and identity.

While the Development Plan goes on to provide guideline heights, the North Lotts & Grand Canal SDZ Planning Scheme provides specific details on heights for the site, as described below.

The North Lotts & Grand Canal Strategic Development Zone (SDZ) Planning Scheme 2014

The site forms part of Block 2 in the SDZ Planning Scheme, identified on the map below.

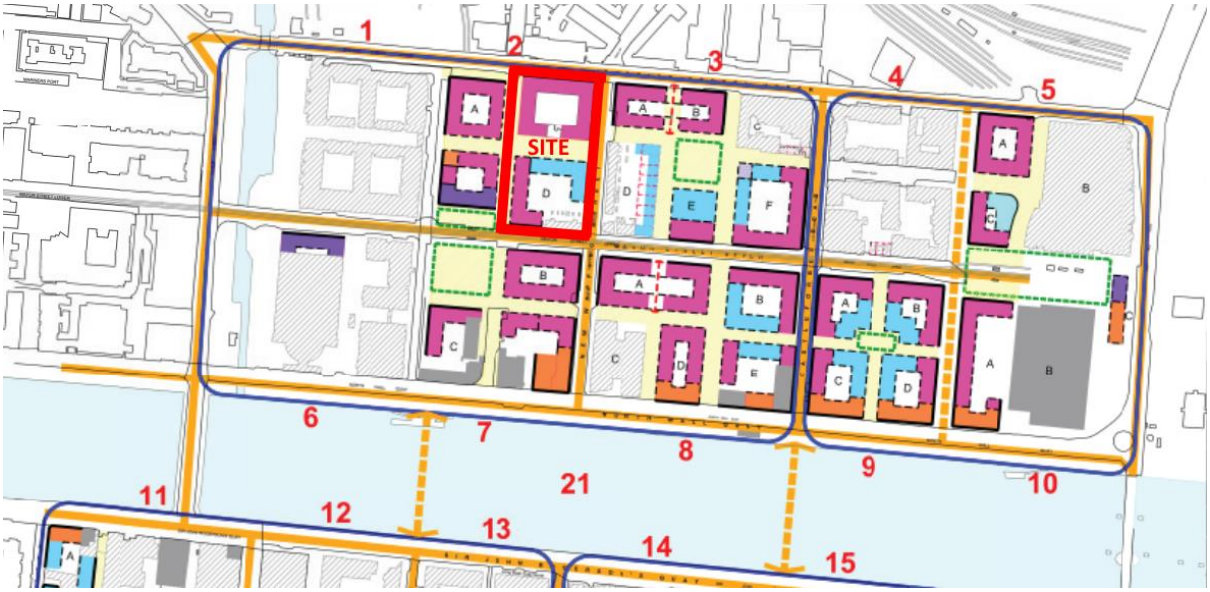


Fig. 6.5: SDZ Planning Scheme Figure 35 (extract)

The site comprises the eastern half of City Block 2 (2B and 2D). For the most part, City Block 2 is envisaged as 5/6 commercial storeys and 6/7 residential storeys (blue/pink in the figure above). The exception is a taller landmark building of 10-12 commercial storeys in the southwest quarter (Block 2C). This is described in more detail in Section 5.5.2 of the SDZ Planning Scheme.

In May 2019, Dublin City Council submitted to An Bord Pleanála a "Review of Building Height & Proposed Amendments" for the SDZ. Chapter 4 of that document identifies scope for additional height within City Block 2 where it fronts on Sheriff Street Upper, identifying local landmark buildings of 12 storeys as appropriate.

City Blocks 1-3 and 6-8 comprise the Spencer Dock hub. Section 4.6.5.2 describes this area as follows:

"The Spencer Dock hub exhibits distinctive qualities of a railway building complex, which along with an historic building stock along parts of the North Wall Quay, references the area's original docking function.

"The complex of buildings including the former Railway Hotel, Station Building and Woolstore lend a distinctive character to the area which sets it apart from other international dockland redevelopment and create a focal point of interest on approach to the city from Dublin Bay. Features such as the drawbridge and quay walls to the river and canal, also contribute to this unique character.

"In the surrounding areas, there is still some remaining evidence of the former residential pattern of small-scale workers' cottages which would have been an integral part of the working docklands.

"Proposals should respect the setting and visual qualities of the railway complex protected structures and provide for publicly accessible uses, active frontages and public spaces. The location of these buildings at the proposed DART Underground Station and Station Square, present an opportunity to create an attractive civic space with special qualities."

The SDZ Planning Scheme identifies shortcomings of achievements to date in the North Lotts in section 4.10.1.2. The limited roll-out of office and residential development so far has led to a fragmented urban landscape. Spencer Dock has suffered failures to animate the streets and public spaces, leaving them sterile and windswept; new development must address this. However, it also recognises the scope for intensification and scale of development in this location due to its established economic and transport focus (4.10.4.1.1), up to a suggested range of 10-12 storeys (4.10.4.1.5).

Views and prospects are also dealt with as part of the SDZ Planning Scheme. In section 4.6.5.7 'Visual Context & Landscape Setting', the "SDZ Planning Scheme promotes the Docklands' distinctive historic environment as a key driver in the sustainable regeneration of the area. In this regard, it seeks to protect the visual amenity of known heritage sites and features, as well as historic views and vistas from within and without the SDZ in order

to conserve its integrity. New developments should consider and recognise the landscape qualities of the Docklands, Poolbeg Peninsula, the Liffey and Dublin Bay."

A Views and Prospects Analysis undertaken in February 2013 informed the preparation of Section 4.6.7 of the Planning Scheme, identifying thirteen existing/potential landmark features and sixteen Key Views that might be affected by new development in the SDZ. For the most part, views are focused on features in the south and east docklands, and only a small number of viewpoints are located in the north docklands near the site (see Figure 6.6 below).

Four key views are relevant to the proposed development: View 3 to the North Wall Quay Station complex from south of the Eastlink Bridge; View 11 extending north along Fitzwilliam Street from Leeson Street; View 12 to Boland's Mills along New Wapping Street from its junction with Sheriff Street Upper; and View 13 east along Mayor Street Upper from the Royal Canal bridge, past the site to Point Square, where the Exo Building will stand 8-17 commercial storeys high. The site falls within the wider context of the North Lotts area in View 3 and directly adjoins Views 12 and 13, while it is directly aligned with View 11.

A detailed analysis of all these viewpoints is provided in the Views and Prospects Analysis February 2013, which informed the preparation of the SDZ. Figure 1 of the Analysis - Cross Section of View 11 - identifies that a building of 56 metres above ground level at the centre of Block 2 (the proposed development site) should remain below the existing skyline of View 11, screened by Holles Street Hospital. The proposed development reaches a maximum height of 47metres above ground level and, on this basis, is considered likely to remain hidden from view.

The Photomontages submitted with the application address each of these views in detail. View 3 as identified in the views and Prospects Analysis 2013 is listed as view 6 in the photomontages submitted with the application, view 11 is listed as view 21, view 13 is listed as view 7 and view 12 is listed as view 9. These areassessed further in section 6.8.8 of this chapter.

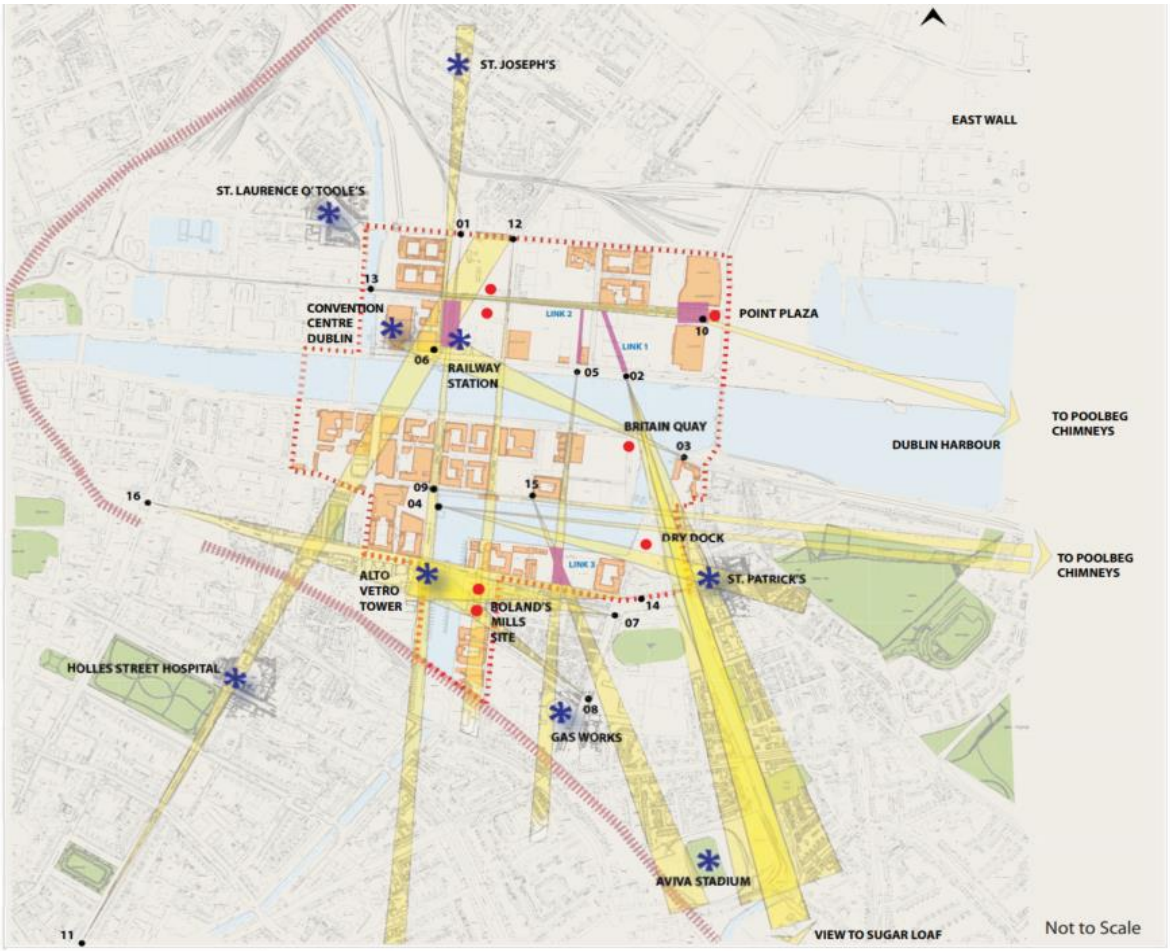


Fig. 18 Views and Vistas

KEY

VIEWING POINT ● 01
VIEWING CONE
EXISTING LANDMARKS
NEW POTENTIAL LANDMARK SITES
DEVELOPED SITES
POTENTIAL NEW STREETS/ PUBLIC SPACES

Fig. 6.6: SDZ Planning Scheme Figure 18 'Views & Vistas'

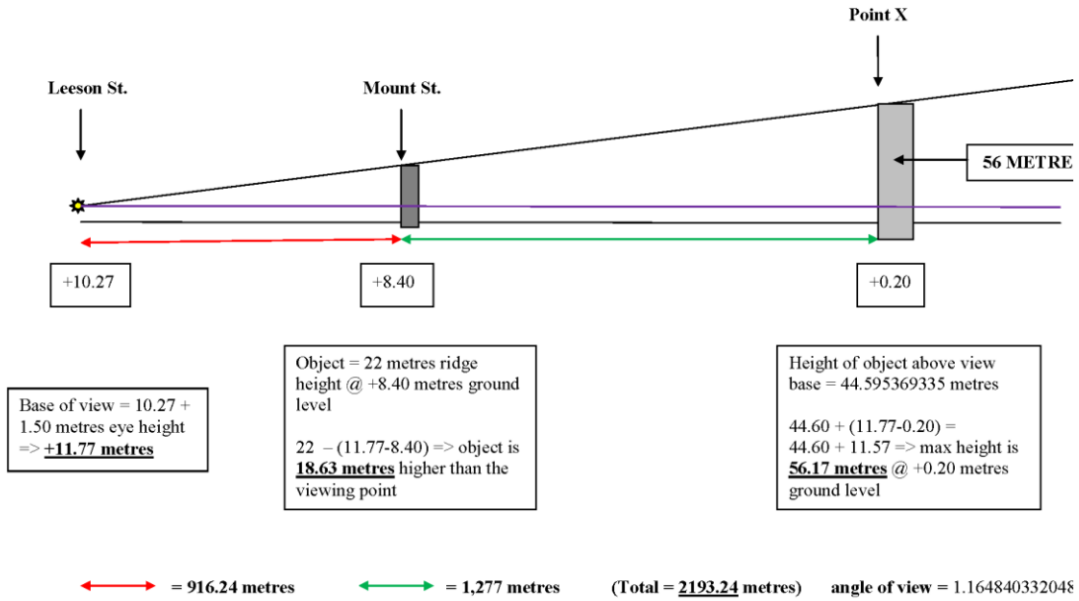


Figure 6.7: SDZ Views and Prospects Analysis, February 2013, Figure 1 'Cross Section of View 11'

National Planning Framework (NPF), February 2018

Section 4 of the NPF promotes making stronger urban places. Notable amongst these is National Policy Objective (NPO) 4 seeks to "ensure the creation of attractive, liveable, well designed, high quality urban places ...".

A more flexible approach to building height is also promoted in the NPF. NPO 11 favours development that encourages more people, jobs and activity in existing urban areas, while alongside this, NPO 13 promotes a performance-based approach to planning standards, and in particular building height, that achieves well-designed high quality outcomes that help to deliver targeted growth.

Key supporting texts to NPO 13 (extracts from page 67 of the NPF) state:

"To enable brownfield development, planning policies and standards need to be flexible, focusing on design-led and performance-based outcomes, rather than specifying absolute requirements in all cases. Although sometimes necessary to safeguard against poor quality design, planning standards should be flexibly applied in response to well-designed development proposals that can achieve urban infill and brownfield development objectives ..."

"In particular, general restrictions on building height or universal standards for car parking or garden size may not be applicable in all circumstances in urban areas and should be replaced by performance-based criteria appropriate to general location, e.g. city/town centre, public transport hub, inner suburban, public transport corridor, outer suburban, town, village etc."

"This more dynamic approach will also be applied to urban land use, where the existing character of land use in an urban area may be subject to change."

This approach is brought into sharp focus in NPO 35, which seeks to "Increase residential density in settlements, through a range of measures including reductions in vacancy, re-use of existing buildings, infill development schemes, area or site-based regeneration and increased building heights."

Finally, compact growth is the first of ten National Strategic Outcomes sought by the NPF.

Urban Development and Building Heights, December 2018

Publication of the National Planning Framework was followed by publication of the Urban Development and Building Heights Guidelines in December 2018 (hereafter 'the Guidelines'), which sets out in detail the approach to building heights that all planning authorities should adopt going forward.

The Guidelines begin with the concern that generic maximum height limits applied by planning authorities can undermine national policy objectives for the more compact forms of urban development sought by the NPF, while also hindering innovation and encouraging poor design outcomes. 'Traditional' building heights are typically no more than 6-8 storeys in the urban centres of cities and major towns.

Para 1.11 of the Guidelines states: "These guidelines therefore set out national planning policy that:

- Expand on the requirements of the National Planning Framework; and
- Applies those requirements in setting out relevant planning criteria for considering increased building height in various locations but principally (a) urban and city-centre locations and (b) suburban and wider town locations."

The Guidelines set out a series of Specific Planning Policy Requirements (SPPRs). Significantly, para 1.14 states that these SPPRs "take precedence over any conflicting, policies and objectives of development plans, local area plans and strategic development zone planning schemes."

Therefore, while the proposed development is mindful of established local policy towards building height, as set out earlier in this section, it is necessarily led by new national objectives and policies set out in the NPF and these Guidelines.

Paragraph 1.10 of the Guidelines states that within the city and town centre areas, such as within the canal ring of Dublin, "it would be appropriate to support the consideration of building heights of at least 6 storeys at street

level as the default objective, subject to keeping open the scope to consider even greater building heights by the application of the objectives and criteria laid out in Sections 2 and 3 of these guidelines, for example on suitably configured sites, where there are particular concentrations of enabling infrastructure to cater for such development …".

Para 1.20 then explicitly states "A key objective of the NPF is therefore to see that greatly increased levels of residential development in our urban centres and significant increases in the building heights and overall density of development is not only facilitated but actively sought out and brought forward by our planning processes ..."

Para 2.11 of the Guidelines emphasises the need to identify specific urban districts with an appropriate location and capacity for clusters of taller buildings. In this regard, the North Lotts & Grand Canal Dock SDZ Planning Scheme has gone some way to achieving this in terms of its masterplan for the area, but with a mostly conservative approach to building heights in the context of these new Guidelines.

National policy is stated unequivocally in para 3.1: "In relation to the assessment of individual planning applications and appeals, it is Government policy that building heights must be generally increased in appropriate urban locations. There is therefore a presumption in favour of buildings of increased height in our town/city cores and in other urban locations with good public transport accessibility."

The Planning Statement by John Spain Associates picks up on these and other points, setting out a strong case that supports higher densities and building height on this site.

Furthermore, the Guidelines recognise the role that greater building height can play in placemaking. Para 2.5 states: "... taller buildings ... can also assist in reinforcing and contributing to a sense of place within a city or town centre, such as indicating the main centres of activity, important street junctions, public spaces and transport interchanges. In this manner, increased building height is a key factor in assisting modern placemaking and improving the overall quality of our urban environments."

In terms of urban design, landscape character and visual amenity, para 3.2 requires that the proposed development demonstrate that it satisfies the following criteria (extracts from a longer list):

At the scale of the relevant city/town

- Development proposals incorporating increased building height, including proposals within architecturally sensitive areas, should successfully integrate into/ enhance the character and public realm of the area, having regard to topography, its cultural context, setting of key landmarks, protection of key views.
- On larger urban redevelopment sites, proposed developments should make a positive contribution to place-making, incorporating new streets and public spaces, using massing and height to achieve the required densities but with sufficient variety in scale and form to respond to the scale of adjoining developments and create visual interest in the streetscape.

At the scale of district/ neighbourhood/ street

- The proposal responds to its overall natural and built environment and makes a positive contribution to the urban neighbourhood and streetscape
- The proposal is not monolithic and avoids long, uninterrupted walls of building in the form of slab blocks with materials / building fabric well considered.
- The proposal enhances the urban design context for public spaces and key thoroughfares and inland waterway/ marine frontage, thereby enabling additional height in development form to be favourably considered in terms of enhancing a sense of scale and enclosure while being in line with the requirements of “The Planning System and Flood Risk Management – Guidelines for Planning Authorities” (2009).
- The proposal makes a positive contribution to the improvement of legibility through the site or wider urban area within which the development is situated and integrates in a cohesive manner.
- The proposal positively contributes to the mix of uses and/ or building/ dwelling typologies available in the neighbourhood.

The proposed development will be assessed against these and other criteria in detail in Section 6.7 of this chapter, setting out mitigation measures incorporated into the development design, and summarised in Section 6.8.1 of this chapter appraising the impact of the proposed development on landscape character.

Established Building Height

It is important to understand building heights that have been permitted, and often built, in the vicinity of the site, both in terms of how planning decisions have previously approached height in the area and as part of the contextual urban character for the proposed development .

Neighbouring permitted development at Block 3 to the east (DSDZ3357/17) comprises six commercial / six-seven residential storeys.

Neighbouring permitted development at Block 7 to the south (DSDZ2661/17) provides for up to nine storeys of commercial floorspace over lower ground floor, including mezzanine floor between ground and first floor adjacent to Mayor Street Upper. This is approximately equivalent to 13 residential floors.

Neighbouring existing development at City Block 1 to the west stands at up to 11 residential storeys, including set-back floors and commercial ground floor, and seven commercial storeys.

The PWC building at City Block 6 to the southwest stands at seven commercial storeys, roughly equivalent to 8-9 residential storeys.

The Central Bank building to the southeast stands eight commercial storeys high, roughly equivalent to ten residential storeys.

Canon Hall immediately north of the site, at the junction of Sheriff Street Upper and East Road, stands eleven residential storeys high, while the adjacent Saudi Arabian Cultural Embassy stands seven commercial storeys high, roughly equivalent to 8-9 residential storeys.

Further afield in the Dublin Docklands area, IFSC 2 west of Spencer Dock includes buildings in the range of 7-10 commercial storeys; contemporary buildings at the Google offices at Grand Canal Dock extend to 16 commercial storey; and the Exo Building at The Point extends up to 17 commercial storeys.

Therefore, in summary, the site is surrounded by buildings that already exceed the preferred minimum threshold of six storeys indicated in the Urban Development and Building Height Guidelines, but also match or exceed the indicative maximum heights set out in the SDZ for Block 2b and 2D (the site). Therefore, the effects of the proposed development upon landscape character and visual amenity will also be appraised in this context.

6.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development is a modification to permitted development Ref. DSDZ2896/18 as amended by Ref. DSDZ4279/18.

The existing permission provides for 349 residential units and a 100 bedroom aparthotel, assembled as two blocks that each extend to seven storeys, with a commercial-height ground floor (including mezzanine) over basement car parking. Landscaped communal amenity space is provided within courtyards at the centre of each block, along with landscaped public street-frontages and a central public space. A new street will also run from north to south along the western edge of the site, bisecting City Block 2.

The proposed development seeks revisions to the permitted Block 1 and 2 to provide for an increase in the number of residential units from 349 no. to 464 no. and the change of use of the permitted aparthotel development to shared accommodation.

The proposed development will increase the height of the permitted development increasing the maximum height of Block 1 from 7 no. storeys (27.5 m) to a maximum height of 13 no. storeys (46.8m) and increasing the maximum height of Block 2 (27.5m) to 11 no. storeys (40.5m). The proposed development will also include the provision of a link bridge between Block 1 and Block 2 at 6th floor level, landscaping, the provision of communal open space, revised under croft level, provision of roof terraces and all other associates site development works to facilitate the development.

Fig. 6.8: Proposed development, east elevation (source: Henry J Lyons, drawing P4-2011 rev. 01)

Block 1 (northern block) will now comprise the following:

- 298 private residential units extending 9-13 storeys high over lower-ground and basement levels, set around a central courtyard.
- The eastern (New Wapping Street) street elevation stands 10-11 storeys high with the upper two storeys partially set back.
- The western elevation stands 11 storeys high, with a partial set-back of the upper two storeys, while extending further to 13 storeys in the northern corner.
- The southern elevation stands 11 storeys high over lower-ground level.
- The northern (Sheriff Street) elevation stands 9-13 storeys high, with eleven and thirteen storeys accentuating the northern corners of the block.
- All elevations support an extensive matrix of windows and balconies.

Block 2 (southern block) will now comprise the following:

- 119 private residential units and 47 ‘Part V’ residential units, plus 84 co-living units, extending 7-11 storeys high over lower-ground floor and basement levels, set around a central courtyard.
- The eastern (New Wapping Street) elevation extends to 7-9 storeys over lower ground floor, incorporating partial set-backs to the top one or two storeys, and a three-storey over lower-ground 'wing' facing the neighbouring existing houses.
- The western elevation extends 9-11 storeys high with a partial set-back to the ninth storey.
- The southern (Mayor Street Upper) elevation is largely confined to the south-western corner of the block, extending to ten storeys high with a five-storey 'wing' facing the neighbouring existing houses. The remainder of the elevation is substantially set-back within the site, behind the existing houses, standing three storeys over lower ground with a further four storeys set back behind.
- The northern elevation extends 7-11 storeys high over lower-ground level
- All elevations support an extensive matrix of windows, and balconies occur throughout except for the co-living units. The south-facing elevation behind the existing houses has almost no windows but with detailing that echoes the scale and rhythm of fenestration elsewhere.

A glazed bridge links the two blocks at sixth floor (seventh storey) between internal amenity spaces.

Materials

- Brick is used throughout as the main finish to the elevations, accompanied by matching metal window frames, mesh panels and balcony railings; the latter informs the finishes used for railings in hard landscaping. Subtly contrasting colours of brickwork distinguish the co-living units from the remaining residential units.

Landscaping scheme

- Central public plaza between the two blocks, comprising high quality formal hard and soft landscaping, including specimen trees and shrubs in raised planters.

- Formal courtyards at the centre of each block, comprising high quality formal hard and soft landscaping, including specimen trees and shrubs in raised planters, and separated from the public realm by gates and railings.
- Evergreen hedgerows enclosing paved private amenity space along western, northern and eastern street frontages and within central courtyards.
- Specimen street trees to New Wapping Street and along the proposed internal street.
- Green roofs throughout plus communal amenity spaces on selected roof terraces.

A more extensive and detailed account of the design proposals is contained in the Architectural Design Statement by Henry J Lyons Architects.

6.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

6.5.1 DESIGN PHASE

Potential risks to landscape character and visual amenity in this urban area, also highlighted in some of the planning policy documents, may arise from the following:

Building location, form and height (see Development Plan Policy SC5, also Chapter 16; Urban Planning & Building Height Guidelines). To avoid or minimise adverse impacts, development should:

- Contribute to a compact, well-designed city
- Protect and enhance the skyline
- Cluster taller buildings
- Make a positive contribution to the city's urban character
- Create opportunities for place-making and local identity
- Facilitate more imaginative, high-quality architecture

Design quality (see Development Plan Policy SC5, SC25, also Chapter 16). To avoid or minimise adverse impacts, the proposed development should:

- Recognise the diversity of the city
- Respond to the character of adjacent buildings, spaces and the local area
- Contribute positively to the city's built and natural heritage
- Provide new landmarks and public spaces where appropriate
- Use imaginative contemporary architecture in an appropriate context
- Achieve high quality, inclusive, sustainable urban design
- Achieve excellence in the ordinary

Built heritage / conservation areas (see Development Plan Policy SC28, CHC2, CHC4). To avoid or minimise adverse impacts, the proposed development should respect and respond to the following:

- Royal Canal Conservation Area
- Liffey Quays Conservation Area
- Protected Structures (former railway buildings) at North Wall Quay /City Block 7
- Residential Conservation Areas to north

Public and private amenity (see Development Plan; SDZ). To avoid or minimise adverse impacts, the proposed development should:

- Animate streets with activity
- Provide character, legibility, variety and visual interest at street level

Visual amenity and designated views (see Development Plan Policy SC7; SDZ). To avoid or minimise adverse impacts, the proposed development should:

- Protect key views and prospects within the wider city
- Respect setting and visual qualities of views to the former railway buildings, especially as seen from the river corridor

- Protect views south from the Spencer Dock area to landmark buildings at Grand Canal Dock – Boland's Mill and the Alto Vetro tower.
- Protect views east along Mayor Street Upper to Point Square
- Avoid/minimise harm to quality of existing views generally
- Avoid poor visual amenity in the new public realm

The following section on Mitigation Measures (6.7.1-6.7.5) accounts for the design response to these issues.

6.5.2 CONSTRUCTION PHASE

Short-term impacts upon landscape character and visual amenity are also likely during the construction phase, arising from the following:

- temporary hoardings, parking, deliveries and site offices
- demolition of existing site structures
- cranes, scaffolds and other temporary structures
- the presence of dynamic, partially-completed buildings
- construction activities at street level (deliveries & mobile plant)

By their very nature, construction impacts are temporary or short-term, where most impacts identified during the construction stage will reduce significantly or disappear once construction has ceased and the proposed development is complete.

The following section on Mitigation Measures (6.7.6) accounts for the design response to these issues.

6.5.3 OPERATIONAL PHASE

Landscape and visual impacts arising from the proposed development potentially will be positive once the construction phase is completed. Ongoing occupation and maintenance of the building will be needed to maintain a positive impact upon the character and amenity of the adjoining streets and the setting of nearby Protected Structures.

6.6 'DO NOTHING' IMPACT

In order to provide a qualitative and equitable assessment of the proposed development, this section considers the proposed development in the context of the likely impacts upon the receiving environment should the proposed development not take place.

A *'do nothing'* impact would result from the permitted development being built out. The permitted development has been constrained by the building height limits that prevailed at the time and is unable to deliver the dynamic building character and skyline afforded by this development proposal. As such, this key location within the Dublin Docklands will be deprived of the rich character and sense of place sought by updated national and local planning policies and which this development proposal seeks to deliver as described in the following sections.

This would result in an adverse impact upon the urban landscape character and visual amenity of this location.

6.7 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

The following section considers the design response to the site, the character of the surrounding area and the policy objectives outlined earlier.

To best illustrate the design response, it is useful to refer to the first of two photomontage booklets prepared by Visual Lab. The 'close-in views' are mapped at the front of the report on an aerial photograph of the site and its immediate surroundings. Photomontages of this proposed development then follow, each accompanied by a matching photomontage of the existing permitted development. Occasional references to the photomontages are made in the following text and are located as follows.

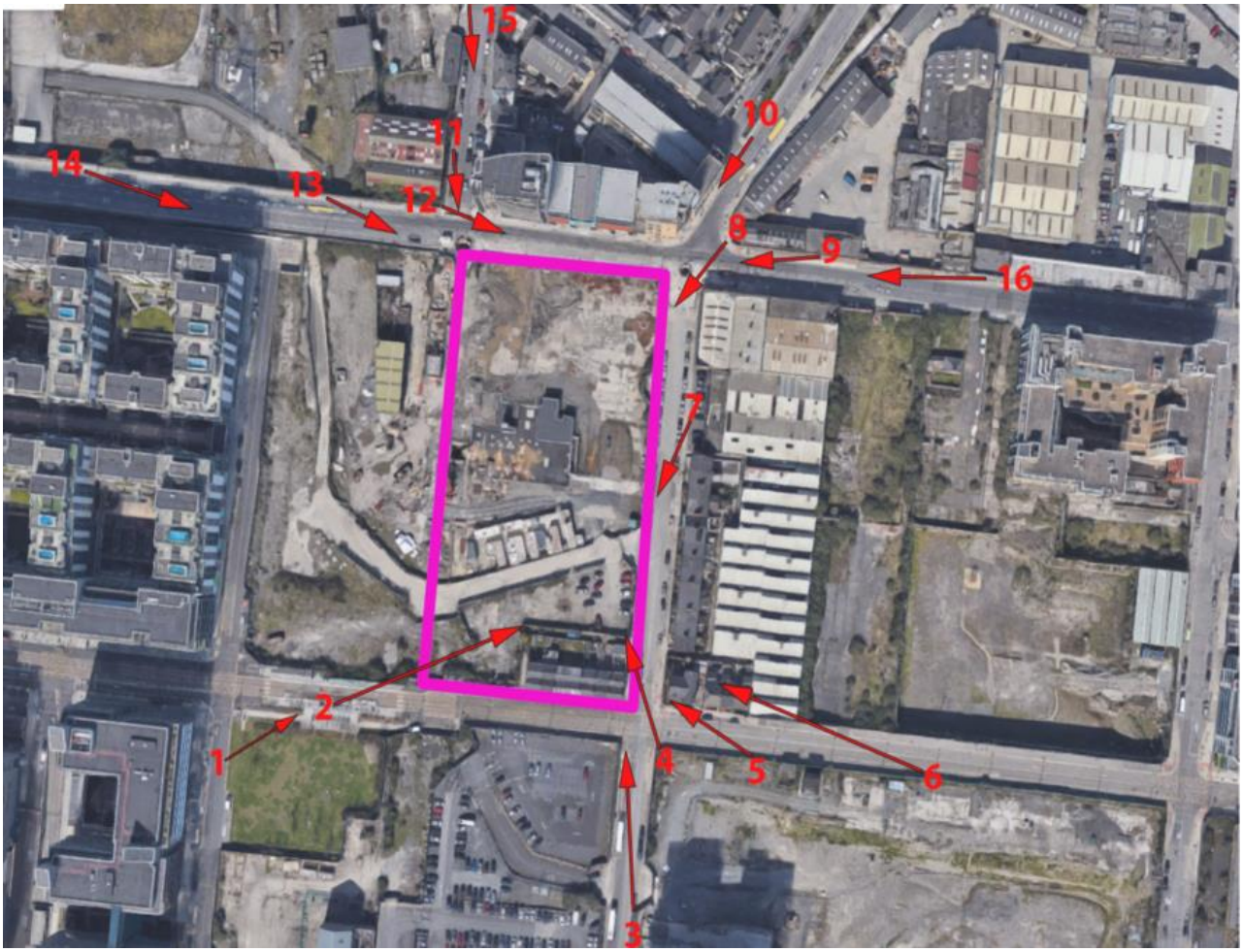


Fig. 6.9: Photomontage View locations – close up vantage points (see booklet by Visual Lab for photomontages).

6.7.1 BUILDING LOCATION, FORM AND HEIGHT

The proposed development seeks to achieve an optimal building height and form that is design-led and dynamic, which makes best use of the land resource and delivers higher residential density while:

- Contribute to a compact, well-designed city
- Protect and enhance the skyline
- Cluster taller buildings
- Make a positive contribution to the city's urban character
- Create opportunities for place-making and local identity
- Facilitate more imaginative, high-quality architecture

Height objectives set out in the SDZ Planning Scheme recognise the scope for taller buildings of 10-12 storeys in City Block 2, given its transport and economic focus within the city and new urban context. However, it is very conservative in applying these heights by confining these taller buildings to the southwest quarter overlooking Station Square, while capping building heights elsewhere within City Block 2 at six or seven residential storeys (or their commercial equivalent). It is in this context that the permitted development at seven residential storeys was secured.

The effect of building height constraints, such as those in the SDZ Planning Scheme, has resulted in the negative effects identified in the Guidelines, in that it has stifled the ability to deliver a diverse and dynamic cityscape and strength of character in this part of the Docklands. The permitted development too has a somewhat uniform roofscape with strong horizontal emphasis that is an inevitable consequence of making best use of the land resource within the SDZ height constraints. This is echoed in other parts of the Dublin Docklands.

Similar effects are seen elsewhere in the city as a result of building height standards applied in the Dublin City Development Plan. The result is a rather monotonous skyline in much of the modern city, including parts of the Dublin Docklands, where a more dynamic approach to building height would benefit a richer and more diverse cityscape. Such observations were also made in a separate landscape and visual impact assessment for City Block 7 by Richard Coleman City Designer.

The planning context has now changed significantly and the Urban Planning & Building Height Guidelines 2018 indicate that within the canal ring of Dublin, at least six storeys should be the default objective while significantly greater height in appropriate locations should also be sought. Many parts of the city within the canal ring are constrained by policy protecting the character and fabric of the historic city core, while City Block 2 just outside the canal ring has almost no such constraints.

If six storeys (minimum) is considered achievable throughout many parts of the city centre, in spite of its constraints, the relatively unconstrained neighbouring Docklands, where this site is located, seems an appropriate location for significantly greater height, given its designation as a Strategic Development Zone, the supporting SDZ policies for a high-density mixed use district of the city, and the modern city district character that is emerging. Its central location and strong transport links further reinforce its suitability as a location for greater height. The Planning Statement by John Spain Associates elaborates on these points.

Consideration must also be given to the existing and permitted built context for City Block 2, as described in the Planning Context section of this chapter. The site is surrounded on all sides by existing or permitted contemporary developments ranging in height from 6/7 residential storeys to the east, up to nine commercial storeys to the south, and up to eleven residential storeys to the west and north. IFSC 2 further to the west includes buildings of 7-10 commercial storeys while Grand Canal Dock south of the river includes buildings up to16 commercial storeys. The Exo building to the east at Point Square will stand 17 commercial storeys high.

Therefore, the existing built/permitted context for the site is 11 residential storeys, or their equivalent, on land adjoining three sides of the site, with taller buildings in the wider area. As a result, the currently permitted development of seven residential storeys on this site would be somewhat out of keeping with its surroundings, a significant underdevelopment of the site that misses the opportunity now presented to establish a more dynamic built form and make a greater contribution to placemaking in this part of the Docklands.

In the context of the foregoing, the proposal for residential blocks ranging from 7-13 storeys high is much more appropriate. This will add variety to the established and complementary range of buildings heights on neighbouring plots, and will contribute to a cluster of taller buildings in the locality that reinforces a positive contemporary urban landscape character and creates strong local identity. The tallest elements of the proposed development will contribute diversity and visual richness to a contemporary skyline in this part of the city, complementing other buildings clusters nearby, such as at Grand Canal Dock, and leaving landmark buildings elsewhere to remain prominent in the landscape, including those along the Liffey Quays, at Point Square and Sir John Rogerson's Quay.

This proposal for taller buildings at City Block 2 not only complements the character of the emerging neighbourhood and its location at a growing transport hub, it is also located at a significant road junction in the Spencer Dock area, where buildings of an appropriate scale and character will aid legibility

There are only three roads that approach the North Lotts and North Wall Quay from the north. The first two are Seville Place / Guild Street to the west and East Wall Road to the east - major routes that connect to bridges across the River Liffey; Sheriff Street Upper links the two in an east-west direction, passing the proposed development site as it does so.

The third north-south link road to Spencer Dock is East Road, which links East Wall across the railway tracks to North Lotts at the junction of New Wapping Street and Sheriff Street Upper – the same junction where the proposed development site is located. The angle of East road to the remainder of the junction means that the proposed development will terminate the vista along East Road.

Given this location at a significant junction and terminating the view along East Road, it is considered appropriate for the proposed development to have a scale and form that reinforces a distinctive character and strong presence, thereby contributing to placemaking and local identity and legibility.

Additional height in itself does not make for high quality, imaginative and distinctive architecture, but lends greater opportunities to achieve these objectives. This is discussed in more detail later in later sections.

The presence of existing two-storey houses on Mayor Street Upper / New Wapping Street, at the south-eastern corner of the site, is an important consideration. The SDZ considered six and seven residential storeys being appropriate adjoining these terraces houses. The proposed development also recognises the need to respond to these dwellings and moderates building height and outlook where it adjoins the houses on Mayor Street Upper.

North of the terraced houses on Mayor Street Upper, building height is initially limited to two residential storeys above a commercial-height storey, stepping back before extending upwards by another four storeys; a substantial setback then occurs for one further storey. There is no outlook from the south-elevation to the rear of the terraces houses.

West of the terraced houses on Mayor Street Upper, the proposed co-living units is initially four residential storeys above a commercial-height storey, stepping back before extending upwards for a further five residential storeys. There is no outlook from the first five storeys above ground level.

6.7.2 DESIGN QUALITY

The design response seeks to:

- Recognise the diversity of the city
- Respond to the character of adjacent buildings, spaces and the local area
- Contribute positively to the city's built and natural heritage
- Provide new landmarks and public spaces where appropriate
- Use imaginative contemporary architecture in an appropriate context
- Achieve high quality, inclusive, sustainable urban design
- Achieve excellence in the ordinary

The site is located within a part of the city where significant change is being driven towards the creation of a major mixed-use, high density, distinctly contemporary city district. The proposed development seeks to establish a strong contemporary urban character on this site, using high-quality architecture, streetscapes and civic open spaces, to reinforce and enhance the character of the Spencer Dock area and thereby strengthen diversity of urban character in the city as a whole.

As discussed in the section on height above, a wide range of building heights have been employed that complement developments on neighbouring sites and contribute to the palette of architectural expression employed in the design process. Height contributes to the delivery of a local landmark development, particularly in its presence on Sheriff Street Upper and at the junction with East Road, but does not seek or merit the presence that other landmarks in the wider Dublin Docklands have.

A more dynamic roofscape has been achieved through a modest addition of floors throughout, dropping floors back in select locations to break up the general roofline, setting back building elevations at upper-floor levels, and accentuating the western/northern corners with further additional height. The Architectural Design Statement by Henry J Lyons Architects illustrates the evolution of building massing in more detail. Photomontage Views 1 and 6 illustrate the permitted and proposed roofscapes to good effect.

Further modulation of the roofscape and elevations of the uppermost floors is achieved through the use of contrasting materials in the building facades. Grey cladding to the set-back floors adds to the recessive appearance of these floors and emphasises both the principal elevations and taller feature corners, which are all finished in brick. In addition to modulating the roofscape, this approach is used to good effect in the relationship with adjoining two-storey houses. Photomontage Views 1, 4 and 6 demonstrate the permitted and proposed roofscapes well.

Brick is used as a principal façade materials, echoing a traditional material used in the wider Dublin Docklands for both historic and modern buildings. The texture, fine grain and colour variation within the brickwork serves to break down the elevations to a more human scale at close quarters, while this and the warmth of the colours provide a pleasing contrast to the smooth grey cladding panels used elsewhere. Subtle colour variations are

used in the brickwork to distinguish between the two residential blocks and the co-living units. Photomontage View 7 illustrates the use of brick well.

Window details pick up on the grey cladding used for the set-back upper floors, using matching materials as colour accents to frame the glazing and add a variety of configurations within a regular layout of window openings. Similarly, balcony frames use matching grey materials to continue the theme throughout the façades. Selected groups of balconies are enclosed by the grey cladding to provide strong vertical elements projecting from some of the façades. Photomontage Views 2, 4 and 7 illustrate these points well.

Hard and soft landscaping plays an important part in the relationship between the buildings and adjoining streets, separating outdoor private space from the public realm and adding a stronger human-scale to the ground-level streetscape. Private terraces are raised slightly above the streetscape, separated by plinth walls, glazed balustrades and evergreen hedges. The glazed balustrades maximise the outlook and passive supervision of the street, while hedges add a soft element to the pedestrian's eye-level while street trees add colour and softness overhead. Photomontage View 7 illustrates this well.

The proposed layout of public streets and open spaces integrates well with neighbouring sites and opens up the block as a whole to greater permeability for pedestrians in particular. The new north-south street links Sheriff Street Upper with Mayor Street Upper, the LUAS stop and Station Park. This, along with the New Wapping Street frontage, will be landscaped with street trees. Along with high quality paving, hedge planting, railings and building frontages, this will create a high quality streetscape.

The central east-west public space between Blocks 1 and 2 provides traffic-free public amenity space in the form of a landscaped civic space. It forms part of an east-west pedestrian route that will ultimately extend through neighbouring blocks to both sides, to the east through City Block 3 where another civic open space will be located and west through the Spencer Dock Apartments at City Block 1. High quality paving, steps, ramps, railings, raised planters and mature planting will establish a high quality public realm for residents, local workers and visitors alike.

6.7.3 BUILT HERITAGE / CONSERVATION AREAS

Refer to Development Plan Policies SC28, CHC2, CHC4. To avoid or minimise adverse impacts, the proposed development should respect and respond to the following:

- Royal Canal Conservation Area
- Liffey Quays Conservation Area
- Protected Structures (former railway buildings) at North Wall Quay /City Block 7
- Residential Conservation Areas to north

The proposed development has a high degree of physical separation from sensitive areas of conservation and built heritage and will have no direct impact upon these. The high standards of design quality and materials will make a positive contribution to the character of the site and its setting, with the intention that where there may be a visual relationship between Conservation Areas / Protected Structures and the proposed development, there will no adverse impacts upon those areas.

More details regarding anticipated impacts on built heritage are proposed in Chapter 4.

6.7.4 PUBLIC AND PRIVATE AMENITY

The design response seeks to:

- Animate streets with activity
- Provide character, legibility, variety and visual interest at street level

Photomontage Views 7, 8 and 12 illustrate some of the following points.

Streets are animated by a number of factors, including ground-floor outlook/access and the provision of a high quality public realm, in particular the east-west street / civic space.

Ground-floor terraces can be accessed from the street via gates and steps, where doors to living rooms provide access/egress from the ground-floor apartments. While this is not the primary means of access to the apartments – they are served by communal entrances and internal corridors – it is likely to encourage some residents/visitors that arrive/leave on foot to use the street entrances. This will add activity to the street.

Terraces and ground-floor living spaces provide varying degrees of outlook onto the street, ensuring there is passive surveillance of street activity. Outlook from terraces and balconies has been improved by replacing the metal balustrades of the permitted scheme with glazed ones. This encourages a sense of safety on the streets.

The provision of a high quality street and civic space running east-west between the two blocks will encourage pedestrian movement through the site and surrounding area, perhaps as a preferred alternative route to the busier trafficked streets. Connected high-quality pedestrian-friendly streets will encourage walking over driving. The ground floor café at the co-living units will also generate local footfall and activity.

Character and visual interest at street level is provided by a mix of hard and soft landscape elements as well as a dynamic interface with the adjacent buildings. Existing and new streets will be enhanced with retaining walls and evergreen hedges that alternate with communal entrances, private gates, service access and car park entrances. Street trees reinforce the separation between roadway and pavement, enhancing the sense of safety for pedestrians, while adding soft and dynamic natural elements to the landscape.

The central street and civic space will be a distinctive feature of the local urban landscape with oval raised planters containing a rich mix of trees, shrubs and perennials set in a wide paved pedestrian plaza. Only maintenance and emergency vehicles have access to this space.

6.7.5 VISUAL AMENITY AND DESIGNATED VIEWS

The design response seeks to:

- Protect key views and prospects within the wider city
- Respect setting and visual qualities of views to the former railway buildings, especially as seen from the river corridor
- Protect views south from the Spencer Dock area to landmark buildings at Grand Canal Dock – Boland's Mill and the Alto Vetro tower.
- Protect views east along Mayor Street Upper to Point Square
- Avoid/minimise harm to quality of existing views generally
- Avoid poor visual amenity in the new public realm

The visual qualities of the proposed development are outlined in detail above and it is considered likely to significantly enhance the character and quality of existing streets. In a wider context, there are designated views to be considered, as well as general views from the public realm.

A comprehensive range of views will be addressed in detail in Section 6.8 of this chapter.

6.7.6 CONSTRUCTION PHASE

The construction phase will be completed quickly through careful construction planning and management prior to commencing on site and throughout the construction phase. Even with all reasonable mitigation measures in place, construction activities will most likely have significant negative effects on visual amenity for adjoining properties and public roads, therefore the sooner construction is complete the sooner negative visual impacts will be reduced or removed completely.

The implications of design changes in terms of urban landscape character and visual amenity will be considered prior to committing those changes in order to maintain the intended visual qualities of new structures and open spaces.

Where practical, contractors' compounds, site offices and parking areas will be located where they will be least overlooked from nearby streets and dwellings.

6.7.7 OPERATIONAL PHASE

Once the construction phase has been completed, there are no specific mitigation measures that need be undertaken in order minimise impacts on landscape character and visual amenity. Regular maintenance of the external building fabric and landscaping will be undertaken to maintain the highest standards of building presentation and streetscape quality.

6.8 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

A series of photomontages have been submitted in two standalone booklets and are referenced in the following text where appropriate. This section refers to the second booklet containing photomontage views from the site's surrounding and wider area. The following map, which also appears on the first page of the booklet, identifies the location and reference number of the viewpoints.

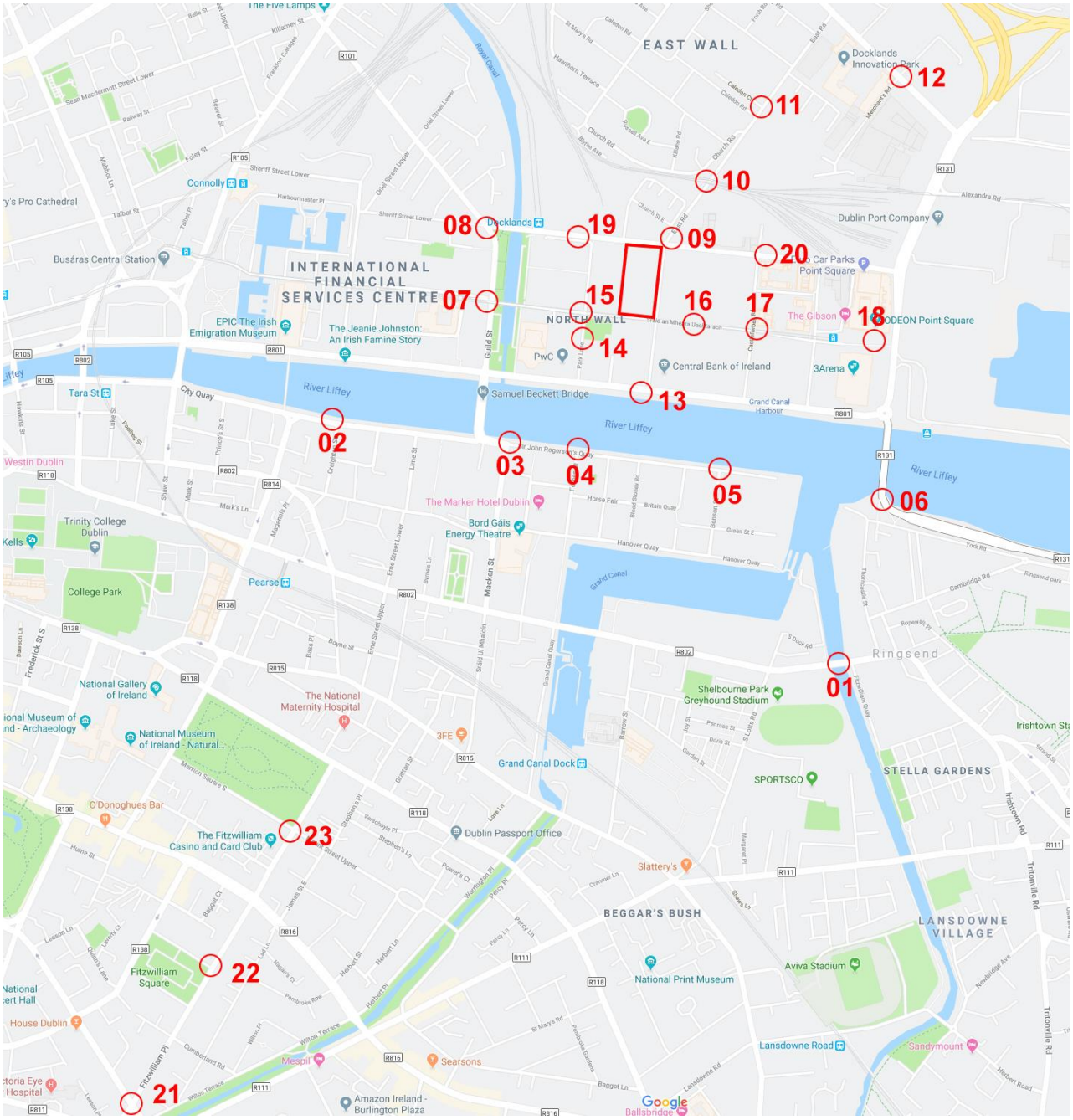


Fig. 6.10: Photomontage View Locations – Distant Views
(see booklet by Visual Lab for photomontages; source - Google Maps)

Each viewpoint is illustrated by photomontages of the proposed development accompanied by a matching photomontage of the permitted development for comparison.

6.8.1 IMPACTS ON LANDSCAPE CHARACTER

The site sits within a fragmented and rapidly changing landscape, where contemporary offices and apartments sit alongside vacant land and construction sites. The streets are not very pedestrian-friendly, often barren and windswept with vacant ground-floor retail units and little interaction or visibility between building and street. It is perhaps temporary as the outlook for further development is positive, but for the moment it is a poor-quality urban landscape which the site currently contribute to.

The proposed development is a logical evolution of the permitted development. The basis for this has been set out in the Planning Context at section 6.3 above, which makes the case for additional height amongst other things, while a detailed account of the carefully considered design approach is set out at section 6.7 above (Avoidance, Remedial & Mitigation Measures) should also be read in conjunction with the following summary.

Paragraph 3.2 of the Urban Planning and Building Height Guidelines requires proposed development to demonstrate how they address a series of design objectives, key excerpts of which are listed towards the end of section 6.3 'Planning Context' earlier in this chapter. The proposed development has responded as follows.

At the scale of the relevant city/town, the Urban Development and Building Heights guidelines seeks:

- "Development proposals incorporating increased building height, including proposals within architecturally sensitive areas, should successfully integrate into/ enhance the character and public realm of the area, having regard to topography, its cultural context, setting of key landmarks, protection of key views."

- "On larger urban redevelopment sites, proposed developments should make a positive contribution to place-making, incorporating new streets and public spaces, using massing and height to achieve the required densities but with sufficient variety in scale and form to respond to the scale of adjoining developments and create visual interest in the streetscape."

Sections 6.3.1 and 6.3.3 above established that the site is located within a rapidly changing part of the city, a strategic development zone with a planning scheme that seeks the regeneration of the Dublin Docklands. That planning scheme is well under way and a distinctly modern new urban landscape is emerging. City Blocks to the west of the site have largely completed their redevelopment, while to the west redevelopment has been more piecemeal until recently. New momentum has returned to development the City Blocks, including the site at City Block 2, City Block 7 to the south and City Block 8 to the southeast.

Examining the site and its context in planning terms has included a review of building heights in neighbouring city blocks, revealing that the site is surrounded on three sides by existing or permitted developments equating to eleven residential storeys, with 2-6 residential storeys close to the fourth side.

In response, an increased range of building heights is considered more appropriate for the site at City Block 2 in the range of 7-11 storeys increasing up to 13 storeys in limited locations. Localised step-downs / step-backs bring heights down to 3-5 storeys close to neighbouring houses. This range of heights complements neighbouring building heights and would be an expression of the importance of this location at a major transport hub/intersection close to the city centre. Clustering taller buildings with those on neighbouring City Blocks will help reinforce urban character and local identity.

The site is located such that it has little scope to interfere with key landmarks and its cultural context is also limited. A small number of views are designated in the SDZ Planning Scheme - chiefly the vista south along New Wapping Street to Grand Canal Dock / Boland's Mill, and the vista east along Mayor Street Upper to Point Square. The absence of buildings on the existing site currently weakens these vistas. However, the proposed development does not obstruct or intrude upon these views but defines a new streetscape that frames these views and channels them towards their desired prospect.

The proposed development incorporates a structured public and private realm that is complementary to neighbouring plots and wider objectives within the SDZ. A new north-south link along the western edge of the site will improve vehicular and pedestrian permeability in this part of Spencer Dock, while a pedestrian-only street running east-west between the two building blocks will contribute to a wider east-west pedestrian corridor

/ pubic plaza and encourage movement between public spaces within the northern Docklands. Enhancements to existing streets by way of street trees and high quality paving will also be provided.

At the scale of district/ neighbourhood/ street, the Urban Development and Building Heights guidelines seeks:

- "The proposal responds to its overall natural and built environment and makes a positive contribution to the urban neighbourhood and streetscape."

- "The proposal is not monolithic and avoids long, uninterrupted walls of building in the form of slab blocks with materials / building fabric well considered."

- "The proposal enhances the urban design context for public spaces and key thoroughfares and inland waterway/ marine frontage, thereby enabling additional height in development form to be favourably considered in terms of enhancing a sense of scale and enclosure while being in line with the requirements of "The Planning System and Flood Risk Management – Guidelines for Planning Authorities" (2009)."

- "The proposal makes a positive contribution to the improvement of legibility through the site or wider urban area within which the development is situated and integrates in a cohesive manner."

- "The proposal positively contributes to the mix of uses and/ or building/ dwelling typologies available in the neighbourhood."

At the street/neighbourhood scale, the varied storey heights accompanied by a series of set-backs and contrasting façade materials create a complex but harmonious roofscape and break down the building mass into an apparent series of complementary interlocking building volumes. This effect modulates the appearance of the skyline, building elevations and broad streetscape to avoid a monolithic appearance and incorporate visual richness at the larger scale and in wider views.

At a finer level of detailing, window and balcony frames are detailed to complement the colour and finish of the cladding panels used selectively across the upper levels of the two blocks. Brick panels with projecting headers add texture and detail to the brick facades, breaking them down to a more human scale.

At present, the streets adjoining the site have little or no built edges to frame the street, channel views along them, add character and visual interest or provide street life. The absence of buildings and public/communal spaces starves the streets of legibility and any sense of place or purpose.

The proposed development provides an important step towards delivering much more interesting, engaging and lively streets in conjunction with its neighbouring City Blocks. The proposed development will give the streets height and volume, spaces within which street trees can grow, provide shelter and visual interest, and provide visual and physical interaction between building, terrace/balcony and street. Hard and soft landscaping define private realm and a transition to street level, raised levels and hedges giving privacy to residents while still providing outlook onto the street.

The central east-west street is a slender public plaza, affording permeability through the site, rich visual interest through the interplay of hard and soft landscaping, and space to socialise and play.

Building height, modulated roofscape, distinct material combinations, detailing, and active, safe, green streets have all been delivered to strengthen local identify of City Block 2 and its neighbouring City Blocks.

Almost all city blocks have been cleared of the former industrial/commercial premises that once stood here, except where they are of historic interest, and there is little greenspace except for Station Square and the canal banks to the west; there are very few street trees. Additional greenspace / planting is to be provided in the civic street that runs between the two blocks, and through new street trees along New Wapping Street and the new north-south street. Hedgerows outlining areas of private amenity will also add greenspace to the streets.

The combined effects of the above are expected to lead to a highly positive impact upon landscape character and satisfy the requirements of the Urban Planning and Building Height Guidelines.

6.8.2 VISUAL IMPACTS: SHERIFF STREET UPPER & NEW WAPPING STREET

Refer to Photomontage Report (Distant Views) Views sequence 19, 9 and 20 – existing, permitted development and proposed development views.

Photomontage View 19 (existing) illustrates the view from Sheriff Street Upper adjoining the new apartments at City Block 1, overlooking the site. Contemporary developments at North Bank and Castleforbes Road (City Block 3 and 4) form a backdrop along with extensive construction in City Blocks 8 and 10. Visible in the middle-ground is part of the Victorian terrace on New Wapping Street, while the Spencer Dock apartments at City Block 1 frame the right side of this view, with the Saudi Arabian Cultural Bureau on the left.

Photomontage View 19 (proposed) illustrates how the proposed development has a major positive impact upon this view, introducing a new building (Block 1) with Block 2 mostly out of sight at from this particular vantage point. The architecture is distinct from its neighbours, exhibiting a boldly articulated roofscape and contrasting 'layered' elevations. The tallest corner of the building occupies a prominent position on the street, emphasised by the contrasting and set-back upper storeys adjoining it. The proposed development demonstrates a much greater degree of individuality, character and presence compared to the permitted development illustrated in View 19 (granted), therefore significantly aiding legibility in the local area.

Photomontage View 9 (existing) illustrates the view from the end of East Road at its junction with Sheriff Street Upper. The view extends along New Wapping Street and across much of the proposed development site. The site's vacant and derelict character is clearly evident, to the detriment of the urban landscape, while the presence of tower cranes on City Block 7 signals imminent change. There are glimpses to the roofs and chimneys of the historic former railway buildings fronting North Wall Quay at City Block 7, which will be hidden by imminent development in that City Block. The PWC building at Block 6 forms a backdrop to the right-hand side.

Views extend beyond New Wapping Street to contemporary office buildings on Sir John Rogerson's Quay, south of the River Liffey. Between and beyond them, new construction at Boland's Mill can be seen. This vista is a designated view in the SDZ Planning Scheme, which seeks to preserve and enhance views along New Wapping Street to the growing cluster of buildings at Grand Canal Dock / Boland's Mill.

Photomontage View 9 (proposed) demonstrates the profound change the proposed development will bring to the visual amenity of New Wapping Street and its junction with Sheriff Street Upper. In the first instance, the proposed development gives the streets definition and enclosure. Richer detailing to the brickwork and a change to balustrade details strengthen the character, contrast and transparency of the elevations when compared to the permitted scheme in View 9 (granted). The additional height in the proposed scheme is not particularly apparent in this view.

The removal of the vacant site, enclosing and enriching the streetscape and framing the long vista along New Wapping Street will have a highly positive impact upon the visual amenity in this location. By framing the long view southwards along New Wapping Street and avoiding interrupting views of Boland's Mill, the proposed development does not adversely impact upon this vista but rather adds focus and positive landscape context for this view.

Photomontage View 20 (existing) illustrates the view from Sheriff Street Upper approaching the proposed development site from the east, overlooking City Block 3 and adjoining the apartments contained within City Block 3. City Block 1 (Spencer Dock apartments) and City Block 6 (including the PWC building) form the backdrop with Canon Hall framing the northern side of Sheriff Street Upper to the right of the view. The principal visual detractor in this view is the derelict factory site in the middle-ground.

Photomontage View 20 (proposed) illustrates how the proposed development consolidates the backdrop to this view, defining a strong skyline with a stepped and layered approach to height, roofscape and elevations. The more restrained scale of Block 2 (to the left) is apparent in its concession to neighbouring houses (out of view), while Block 1 (to the right) is more prominent. The accented height of the northern corner faces across Sheriff Street Upper to Canon Hall, which together frame and focus the view along the street.

This is likely to be a short-term view, as permitted development for City Block 3 in the foreground will obscure most of the proposed development, revealing only the northern (right-hand) part of Block 1. In the short term before City Block 3 is developed, the enclosure and bold presence of the proposed development will have a moderately positive visual impact, reducing to a slightly positive or neutral visual impact once City Block 3 is developed.

6.8.3 VISUAL IMPACTS – MAYOR STREET UPPER & STATION SQUARE

Refer to Photomontage Report (Distant Views) Views 14 to 17 – existing, permitted development and proposed development views.

Photomontage View 14 (existing) illustrates the view from the temporary park at the north-western corner of City Block 7, overlooking Mayor Street Upper and the Spencer Dock LUAS stop. Views extend across City Block 2 to a backdrop formed by Canon Hall and the Saudi Arabian Cultural Bureau, while North Bank stands to the right. The park provides a pleasing outlook from this position but lacks a built context (in this view) to frame and focus upon it, and it is somewhat 'lost' as a result.

Photomontage View 14 (proposed) demonstrates how the proposed development adds a strong and dynamic backdrop that goes part of the way to providing a setting for the park. The articulation of the roofscape resulting from varied heights and set-backs together with subtle material contrasts create a pleasing outlook from the park, though the hoardings and vacant land in the middle-ground will remain until such time as the western half of City Block 2 is developed. The architecture contributes much stronger character and visual richness to the urban landscape that the permitted developed illustrated in View 14 (granted), and as a result, visual impacts are highly positive.

Photomontage View 15 (existing) illustrates the view approaching the Spencer Dock LUAS stop from immediately to the west. The hoardings surrounding City Block 2 provide a weak edge to the streetscape and create a confusing backdrop in conjunction with the modern development beyond at North Bank / Castleforbes Road. The clutter of lighting and overhead power lines adds to this confusion. Emerging development at City Block 8 is evident at the right of this view. Trees to the right signal the presence of Station Square.

Photomontage View 15 (proposed) illustrates the proposed development as a bold intervention in the urban landscape. The dynamic roofscape of Block 2 (Block 1 is hidden from view) is evident and the layered effect of storey heights, set-backs and contrasting façade materials/colours provide a visually rich architectural composition. A contrast of brick colour and the absence of balconies subtly draw a distinction between the co-living units and adjacent apartments. There is significantly greater visual richness to the proposed development compared to the permitted scheme illustrated in View 15 (granted).

In due course the future development of the southern portion of Block 2 is likely to screen the proposed development from view. In the meantime, the proposed development will have a highly positive visual impact upon the urban landscape and reinforce the sense of place at Station Square.

Photomontage View 16 (existing) illustrates the view along Mayor Street Upper towards City Blocks 1 and 2, with City Block 8 framing the left edge of this view and City Block 3 occupying the right side. Housing and garages along Mayor Street Upper define a small pocket of a more traditional streetscape at this location but the backdrop of the Spencer Dock apartments diminishes this traditional character.

In Photomontage View 16 (proposed), the proposed development redefines the backdrop and brings the skyline much closer to the viewer. The proposed development appears as a series of stepped and interconnecting volumes with a complementary range of contrasting details and finishes. Building height generally appears to increase as it steps back from the street, leaving the co-living units as a prominent feature in the streetscape. There is a marked contrast of scale between the proposed development as a whole and the neighbouring houses, but the stepped building volumes and heights provide a visual transition between the two.

The proposed development exhibits greater strength of character and visual richness than the permitted development illustrated in View 16 (granted) and as such makes a greater contribution to local urban character and identity. Visual impacts arising from the proposed development are therefore considered moderately positive.

Photomontage View 17 (existing) illustrates the view from the junction of Mayor Street Upper and Castleforbes Road looking northwest. The view extends across City Block 3 encompassing apartments at North Bank to the right, Canon Hall and the Saudi Arabian Cultural Bureau in the background at the centre and the Spencer Dock Apartments in the background to the left. The streetscape is poorly defined by the lack of buildings, though new development is under way on City Block 8 at the left edge of this view.

Photomontage View 17 (proposed) illustrates the view across City Block 3 encompassing the entire eastern elevation of the proposed development. The dynamic design of the roofscape and facades is very evident in this view, creating a complex but coherent architectural composition with a strong visual richness. A comparison with the same view of the permitted development in View 17 (granted) clearly illustrates how constrained building height in the permitted scheme limited the scope for creative architectural expression has produced a monotonous skyline.

Photomontage View 17 (proposed) is likely to be a short-lived view, as the development of City Block 3 in the foreground will obscure almost all of the proposed development. In the meantime, visual impacts are considered to be highly positive.

6.8.4 VISUAL IMPACTS – RIVER LIFFEY CORRIDOR & RINGSEND

Refer to Photomontage Report (Distant Views) Views 1 to 6 – existing, permitted development and proposed development views. This sequence of views demonstrates that the proposed development, despite its additional height, is frequently obscured by intervening buildings along the riverfront.

Photomontage Views 1a/1b (existing) illustrate a view from the bridge over the River Dodder on Ringsend Road, looking northwest across the River Liffey, encompassing part of Sir John Rogerson's Quay in the middle-ground and Spencer Dock in the background. This view has changed very significantly in the last four years, during which time extensive development has occurred at Sir John Rogerson's Quay, including the recently completed Capital Dock. The proposed development is completed obscured by intervening buildings as illustrated in Photomontage Views 1a/1b (proposed), therefore there will be no visual impacts upon this view.

Photomontage View 2 (existing) illustrates the view from City Quay looking east along the River Liffey. This is an iconic vista where the Campshires, the Jeanie Johnson, the Convention Centre Dublin and the Samuel Beckett Bridge are all distinctive features. Photomontage View 2 (proposed) demonstrates that the proposed development lies sufficiently north of the river to be completely screened from view by existing waterfront buildings, as indicated by the red outline, with no impact upon visual amenity.

Photo View 3 (existing) illustrates the view from Sir John Rogerson's Quay at the junction with Cardiff Lane, part of a major transport route between the south and north sides of the River Liffey, via the Samuel Beckett Bridge. Prominent features in this view include the Convention Centre Dublin (left, largely out of shot), the PWC building (left), the former North Wall Quay Station (centre), former North Western Hotel (right of centre) and the Central Bank of Ireland building (right). The latter occupies City Block 8 where extensive development is ongoing, as evident in this view.

Photomontage View 3 (proposed) demonstrates that the proposed development remains substantially screened behind the PWC building, but part of the southern façade of Block 2 can be glimpsed between and beyond the PWC buildings and former railway station building. Even in this small glimpsed, the dynamic façades and roofscape are evident, and more visually rich than the permitted development illustrated in View 3 (granted).

This is, however, likely to be a temporary view as part of City Block 7 in the foreground is under construction and likely to substantially obscure the proposed development. In the meantime, the proposed development does not contribute significantly to the view or detract from either the modern or historic waterfront buildings. Visual impacts are therefore slight and neutral.

Photomontage View 4 (existing) is taken on Sir John Rogerson's quay directly across the River Liffey from Block 7, incorporating views of the PWC building (far left), former North Wall Quay Station (left), former North Western Hotel (centre) and Central Bank of Ireland building (right). In the background is a glimpse of Canon Hall on Sheriff Street Upper. The two tower cranes at the centre are part of the construction that has started at City Block 7.

Photomontage View 4 (proposed) shows the proposed development as a modest addition to the view, appearing between the former North Wall Quay Station and hotel towards the left of this view. The dynamic character of the buildings are evident in the modulated roofscape and building volumes, aided by the contrasting palette of façade materials, characteristics that are largely absent in the view of the permitted development (View 4 (granted)).

Despite the additional height proposed as part of the proposed development, it remains unimposing upon views from the river such as this and makes a balanced and positive contribution to the composition of contemporary buildings emerging in this view. The view will soon be substantially obscured by substantial development in the foreground (City Block 7). In the meantime, visual impacts are slightly positive.

Photomontage View 5 (existing) illustrates the view from Britain Quay towards its eastern end near the junction with Benson Street, looking northwest. The Central Bank of Ireland building dominates the waterfront along with its neighbour to the right, while further development is taking place further to the right. The result of the new waterfront development is that the proposed development is completely screened from view and there are no visual impacts arising from it as a result, as demonstrated by Photomontage View 5 (proposed).

Photomontage View 6 (existing) illustrates a view from the East Link Road immediately south of the bridge and close to York Road. There is an extensive vista along the River Liffey taking in a large proportion of the north quays along with Capital Dock at the left of this view. The Convention Centre Dublin, PWC building and Central Bank of Ireland building lie at the centre of the view with further new development taking place to the right of them. The proposed development lies behind the buildings currently under construction and will be entirely screened from view, as demonstrated by Photomontage View 6 (proposed).

Photomontage View 13 (existing) illustrates a glimpsed view towards the site from North Wall Quay along what will be a new street once City Block 7 in the foreground is developed; current construction work here is evident between the former railway hotel and station, which also offers a glimpse to the Saudi Arabian Cultural Bureau building in the background.

Photomontage View 13 (proposed) illustrates a glimpse to the western and part of the southern elevation of the proposed development. At this angle, the dynamic roofscape and building elevations are partially evident and the greater visual richness of the architectural composition is evident when compared to the permitted development illustrated in View 13 (granted). Part of this view may remain when City Block 7 is developed, though it will be largely confined to the western elevation and streetscape. In the context of this vista along a new street, visual impacts will be slightly positive as the proposed development contributes to the street's setting.

6.8.5 VISUAL IMPACTS – EAST WALL APPROACH

Refer to Photomontage Report (Distant Views) Views 10 to 12 – existing, permitted development and proposed development views.

Photomontage View 10 (existing) illustrates an elevated view from East Road above the railway line, encompassing Canon Hall and the Saudi Arabian Cultural Bureau (centre/right), the Spencer Dock apartments (right); the PWC building (centre) and the tower cranes at City Block 7 towards the left. While strictly outside the Dublin Docklands area, its elevated position and close proximity to Sheriff Street afford it significant influence from changing Docklands landscape.

Photomontage View 10 (proposed) illustrates the proposed development terminating the vista along East Road where PWC building is now screened entirely from view. The proposed development provides strong definition to junction of New Wapping Street and Sheriff Street Upper, which is currently missing. The permitted scheme (View 10 (granted)) also achieved this.

Canon Hall in the foreground of Photomontage View 10 (proposed) is now matched and exceeded in scale and height by the proposed development, while the combined effect of these with other buildings in this view describes a strong sense of arrival at a place, which is also currently missing. Buildings up to nine commercial storeys will feature behind the proposed development in the near future and further reinforce this sense of place. On this basis, the visual impact of the proposed development is considered to be moderately positive

Photomontage View 11 (existing) illustrates a view from East Road north of the railway line. There are partial views of the PWC building (terminating the vista along the road), Canon Hall to the right, and and new construction neighbouring the Central Bank of Ireland in the background to the left. A vacant development plot and hoarding in the foreground detract from the character and quality of this view.

Photomontage View 11 (proposed) shows the proposed development now screening the PWC building entirely from view, replacing it as the terminating feature of this view along with Canon Hall. The proposed development now contains the vista and suggests a clear destination for those travelling along the road. The stepped roofscape and elevations combined with a contrast of colour and materials to establish a strong urban character that contrasts with the approach along East Road and improves upon that delivered by the permitted development (see View 10 (granted)). Visual impacts are considered to be highly positive as a result.

Photomontage View 12 (existing) illustrates a vista long the residential street Merchant's Road from East Wall Road. The proposed development site in fact lies slightly to the right of this vista and is screened by intervening buildings, as illustrated by the red outline on Photomontage View 12. There will be no visual impacts from the proposed development as a result.

6.8.6 VISUAL IMPACTS – POINT VILLAGE APPROACH

Refer to Photomontage Report (Distant Views) View 18 – existing, permitted development and proposed development views.

Photomontage View 18 (existing) shows the existing view from the square at the Point Village looking west, encompassing the LUAS stop, the vista along Mayor Street Upper, new construction at City Block 8 to the left, the Three Arena at the very left, recent apartments towards the right and the Point Village at the right. A distant view to the southern end of the Spencer Dock Apartments terminates this view.

Photomontage View 18 (proposed) demonstrates that the southern end of Block 2 will be visible in front of the Spencer Dock Apartments. This element of the proposed development is the co-living units that faces adjoining houses and has limited in its detailing with few windows. However, it is also a very small part of this vista with a slight and neutral visual impact arising as a result.

6.8.7 VISUAL IMPACTS – NORTH CITY APPROACH

Refer to Photomontage Report (Distant Views) Views 7 and 8 – existing, permitted development and proposed development views.

Photomontage View 7 (existing) illustrates the view from Mayor Street Lower approaching Guild Street. Spencer Dock linear park lies to each side of the road bridge in the middle-ground and the Convention Centre Dublin lies at the right with the PWC building behind it. Spencer Dock Apartments and adjacent commercial buildings lie to the left. The vista along Mayor Street Upper beyond the canal extends past the site.

Photomontage View 7 (proposed) demonstrates that a small part of the proposed co-living units will be visible behind the commercial building at the centre of this view. There is little to draw attention to it, easily complementing nearby buildings, and it doesn't intrude significantly upon the streetscape of Mayor Street Upper. Visual impacts are therefore slight and neutral.

Photomontage View 8 (existing) illustrates the view from Seville Place at the junction with Sheriff Street Upper and Guild Street. The vista along Sheriff Street Upper is framed by the lifting bridge with the Spencer Dock Apartments as a backdrop to the right. This is a major approach to the quays and the south city.

Photomontage View 8 (proposed) illustrates the proposed development framed by the lifting bridge. At this distance, the grain and materials of the proposed development complement that of the apartments in the foreground, making the development appear a natural extension of the residential streetscape on the south side of Sheriff Street Upper. It also suggests a destination for the road which currently, as it rises over the railway tracks, appears to go nowhere.

The intervening bridge structure interrupts the view of the proposed development, making it difficult to appreciate the form of the proposed development or compare its merits to the permitted development (illustrated in View 8

(granted)). The proposed development makes a small contribution to this view, where visual impacts will be slight and positive.

6.8.8 VISUAL IMPACTS – 'GEORGIAN MILE'

The vista along Fitzwilliam Place / Fitzwilliam Street is a Key View identified in the Views and Prospects Analysis February 2013, which seeks to protect the existing roofscape and skyline, particularly that above Holles Street Hospital which terminates the vista. Three Photomontage Views have been prepared to support the following analysis.

Photomontage View 21 (existing) illustrates the view along Fitzwilliam Place/Street from the pedestrian island at its junction with Leeson Street. This long street is framed to both sides by Georgian buildings standing four storeys over basement, with Holles Street Hospital terminating the view at 900 metres from the viewer; there is a high degree of consistency and continuity in the building character, height and roofscape of the street.

The red outline superimposed on Photomontage View 21 (red line) represents the position and scale of the proposed development, which lies at 2.2km from the viewer. It demonstrates that the proposed development is screened from view by Holles Street Hospital, with only the very slightest occurrence at the skyline.

Photomontage View 21 (proposed) develops this view further, demonstrating that no perceptible change occurs to the view along Fitzwilliam Place/Street as a result of the proposed development. A detailed examination of the image will reveal only the slightest presence of the parapet level of the 13 storey elements on the north west corner of the proposed Block 1, which occur as thin pale lines running along the ridge of Holles Street Hospital. They lack scale and against the sky they are virtually invisible. In the context of the wider view of Fitzwilliam Place/Street, as seen by the naked eye, these features will not be distinguishable as new features at the skyline. Visual impacts will therefore be imperceptible and neutral.

Photomontage Views 22 and 23 (existing) illustrate views from Fitzwilliam Street approaching Holles Street Hospital. Photomontage View 22 (proposed) from the junction with Fitzwilliam Square North incorporates a red outline of the proposed development, demonstrating that it is entirely screened from view by intervening buildings, including Holles Street Hospital. Similarly, Photomontage View 23 (proposed) at the junction with Merrion Square South incorporates a red outline of the proposed development, demonstrating that it is entirely screened from view by Holles Street Hospital. In both cases, there will be no visual impacts as a result of the proposed development.

Therefore, the 'Georgian Mile' identified as View 11 in the Views and Prospects Analysis 2013 will not experience any perceptible or adverse visual impacts as a result of the proposed development.

6.8.9 CUMULATIVE LANDSCAPE AND VISUAL IMPACTS

The proposed development is described earlier in this chapter as being part of a cluster of taller buildings within Dublin City, including those already built, under construction and with planning permission, within the rapidly changing landscape of the Dublin Docklands. The proposed development will have a highly positive impact upon landscape character by making a significant contribution to this emerging contemporary urban landscape.

The site is surrounded on all sides by existing or permitted contemporary developments ranging in height from 6/7 residential storeys to the east, up to nine commercial storeys to the south, and up to eleven residential storeys to the west and north. IFSC 2 further to the west includes buildings of 7-10 commercial storeys while Grand Canal Dock south of the river includes buildings up to 16 commercial storeys. The Exo building to the east at Point Square will stand 17 commercial storeys high.

In this context, the currently permitted development of seven residential storeys on this site would be somewhat out of keeping with its surroundings, a significant underdevelopment of the site that misses the opportunity now presented to establish a more dynamic built form and make a greater contribution to placemaking in this part of the Docklands.

The proposed development for residential blocks ranging from 7-13 storeys high is much more appropriate. This will add variety to the established and complementary range of buildings heights on neighbouring plots, and will contribute to a cluster of taller buildings in the locality that reinforces a positive contemporary urban landscape character and creates strong local identity. The tallest elements of the proposed development will contribute diversity and visual richness to a contemporary skyline in this part of the city, complementing other buildings clusters nearby, such as at Grand Canal Dock, and leaving landmark buildings elsewhere to remain prominent in the landscape, including those along the Liffey Quays, at Point Square and Sir John Rogerson's Quay.

In addition to building height and form, high standards of architectural detailing, open space and landscaping will contribute to attractive new streetscapes that enhance the character, vitality, visual amenity and continuity of the wider street network. These attractive new streets will provide an attractive context for views and vistas through the area towards landmarks and key locations in nearby parts of the city. By helping to complete an cohesive and attractive network of street through the wider area, the proposed development will encourage more street life in the locality. The proposed development will therefore have significant positive impact upon the character and visual amenity of the local street network.

6.8.10 SUMMARY IMPACTS ON LANDSCAPE CHARACTER AND VISUAL AMENITY

The proposed development has succeeded in reworking the permitted development in light of new planning policy and guidance on building heights to deliver a significant improvement to its architectural expression and contribution to the urban landscape of Spencer Dock while also optimising use of the land resource at a prime location within the central city.

In reworking the design of the permitted development, the proposed development has delivered significant enhancements that include the following:

- Recognising the city's diverse urban landscape
- Responding successfully to the character of adjacent buildings, spaces and the local area
- Protecting and enhancing the city skyline
- Clustering taller buildings at the heart of a major city hub
- Contributing positively to the city's architectural heritage
- Providing a new local landmark and high quality public & communal spaces
- Delivering imaginative contemporary architecture in an appropriate context
- Reinforcing place-making and local identity
- Achieving high quality, inclusive, sustainable urban design
- Demonstrating excellence in the ordinary
- Animating streets with activity
- Providing character, legibility, variety and visual interest at street level
- Protecting and enhancing key views and prospects within the wider city
- Respecting the setting and visual qualities of the former railway buildings at North Wall Quay
- Protecting views south from the Spencer Dock area to landmark buildings at Grand Canal Dock – Boland's Mill and the Alto Vetro tower.
- Protecting views east along Mayor Street Upper to Point Square
- Protecting views along the 'Georgian Mile' at Fitzwilliam Place / Fitzwilliam Street
- Avoiding/minimising harm to quality of existing views generally
- Avoiding poor visual amenity in the new public realm

As a result of these, the impacts of the proposed development upon landscape character are likely to be highly positive. Visual impacts will vary from neutral to highly positive, with some views being short-term until neighbouring development substantially obscures the proposed development from view.

6.9 MONITORING

This section addresses the effects that require monitoring, along with the methods and the agencies that are responsible for such monitoring.

No ongoing monitoring is considered necessary in relation to the impact of the development on landscape character and visual amenity.

6.10 REINSTATEMENT

While not applicable to every aspect of the environment considered within the EIAR, certain measures may be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact to the environment.

Reinstatement is not considered applicable to landscape and visual impacts. The existing site is a vacant brownfield site that makes no positive contribution to the local urban landscape. Future 'reinstatement' is likely to comprise further development of the site.

6.11 INTERACTIONS

Landscape and visual impacts typically interact with built heritage and ecology/biodiversity, both of which are addressed in detail in Chapters 4 and 5 of this EIAR.

There is little built heritage of significance within the vicinity of the site. Chapter 4 of this EIAR does not identify any significant adverse impacts of the proposed development on Conservation Areas or Protected Structures. Development of this vacant city block will provide an enriched contemporary urban landscape that is likely to have a positive impact, if any, upon the setting of built heritage features in the surrounding landscape.

There is little biodiversity interest on the site or within the vicinity of the site. Chapter 5 does not identify any significant adverse biodiversity impacts arising from the proposed development. The incorporation of green roofs and landscaping within the site is likely have a slightly positive impact upon the biodiversity of the site, as well as upon landscape character and visual amenity.

6.12 DIFFICULTIES ENCOUNTERED IN COMPILING

No significant difficulties were experienced in compiling this Chapter of this EIAR document.

Chapter 7:
Land and Soils

7.0 LAND AND SOILS

7.1 INTRODUCTION

Author: Kimberly Porter Hannigan (BSc)

This section of the Environmental Impact Assessment Report (EIAR) has been prepared to assess the impact of the proposed development on the land and soils during the demolition, construction and operational phases of the proposed development. It will also identify the characteristics, predicted impact and mitigation measures arising from the different phases.

7.2 STUDY METHODOLOGY

RSK have undertaken an Environmental Review and Gap Analysis and a Generic Quantitative Risk Assessment (GQRA) prior to commencement of the development works at the site. The Environmental Review and Gap Analysis consisted of a review of available information on the site and the review of ground conditions and waste classification reports completed by AECOM as part of the sale of the site.

The aim of the Environmental Review and Gap Analysis was to:

- Assess the current status of the soils and groundwater at the site;
- Identify gaps in the existing groundwater and soil data set;
- Comment on the requirement for a sheet pile wall around the boundary of the site; and,
- Recommend additional assessment to confirm if remediation measures are required.

Subsequently, a GQRA was completed at the site which comprised the drilling and installation of groundwater monitoring wells at the site along with laboratory analysis of soil, groundwater and surface water samples. The purpose of the GQRA was to:

- Characterize the soil, groundwater and ground gas regimes at the site;
- Establish the contamination status of the soil and groundwater underlying the site; and,
- Identify any potentially significant risk to human health and/ or the water environment.

The assessment of the potential impact of the proposed development on the land and soils was carried out according to the methodology specified by the EPA and the specific criteria set out in the Guidelines on Information to be Contained in an Environmental Impact Statement (EPA 2002 and 2017 Draft), EIA Directive 2014/EU/52, Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003), EPA Draft EIAR Guidelines 2017, Environmental Impact Assessment (EIA), Guidance for Consent Authorities Regarding Sub-Threshold Development (DoEHLG 2003), Development Management Guidelines (DoEHLG, 2007) and Guidelines for Planning Authorities and An Bord Pleanala on Carrying out Environmental Impact Assessments (DoECLG, March 2013).

7.3 THE EXISTING RECEIVING ENVIRONMENT

The site is located at the junction of Sheriff Street and Wapping Street, Spencer Place, Dublin 1. The site has an approximate area of 1.26 hectares and is centered on Irish Grid Reference 0176 346. The majority of the site is currently vacant, a Dublin City Council sewage pumping station is located in the central section of the site. A review of available historical maps indicates the site was largely undeveloped until 1907, when it was utilised as a timber yard. Following this, the site had some residential properties along the south-east section of the site.

Land use surrounding the site is predominately commercial and residential in nature. The site is bound to the north by Sheriff Street Upper, with an office/ residential apartment complex and terraced housing beyond. The closest residential properties are located approximately 20m north of the site. Railway sidings are present approximately 100m to the northeast and 150m to the north of the site.

A number of terraced residential properties are located on the south eastern site boundary. Mayor Street forms the remainder of the southern site boundary. New Wapping Street forms the eastern site boundary, with a number of terraced residential properties located on the eastern side of the street.

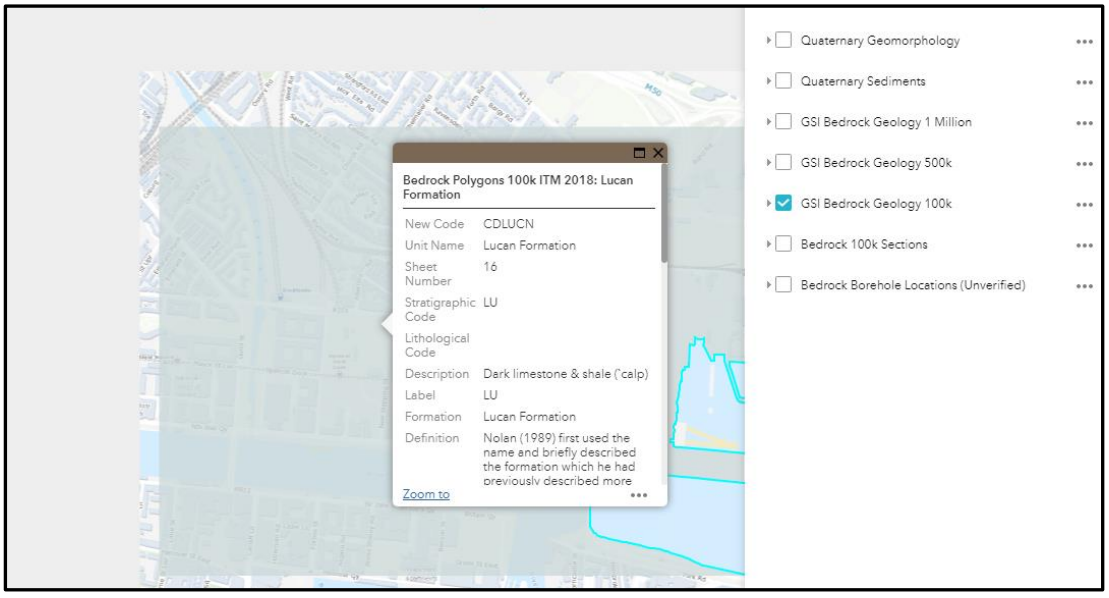
The currently undeveloped western half of City Block 3 (office development) is located immediately west of the site. An access road to apartment complexes is locate beyond. The closest residential properties are approximately 20m north of the site.

The site investigation identified Made Ground to a maximum depth of 4.0metres below ground level (bgl) in borehole BH04. The made ground was found to be quite variable, but generally comprised of sandy gravel fill with occasional clay layers.
The made ground was generally underlain by alternating gravel and silt layers with occasional clay layers to a maximum investigated depth of 10.0m bgl. Bedrock was not encountered in any of the boreholes

7.3.1 BEDROCK GEOLOGY

The bedrock geology (100K) is underlain by Lucan Formation – dark limestone and shale (calp). The beds are predominately fine-grained distal turbidities in the north Dublin basin. The formation is intermittently exposed on the coast between Rush and Drumanagh Head. The formation ranges from 300m to 800m in thickness.
Refer to Figure 7.1 below.

Figure 7.1: Bedrock Mapping of Area by GSI



7.3.3 SOILS

The site investigation identified made ground generally comprising sandy gravel fill with occasional clay layers.
The made ground was underlain by alternating gravel and silt layers with occasional clay layers to a maximum depth of 10.0 mbgl.

7.3.4 HYDROGEOLOGY

Regional Hydrogeology

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 potential of the rock to store and transport water is governed by permeability, of which there are two types, intergranular and fissure permeability.

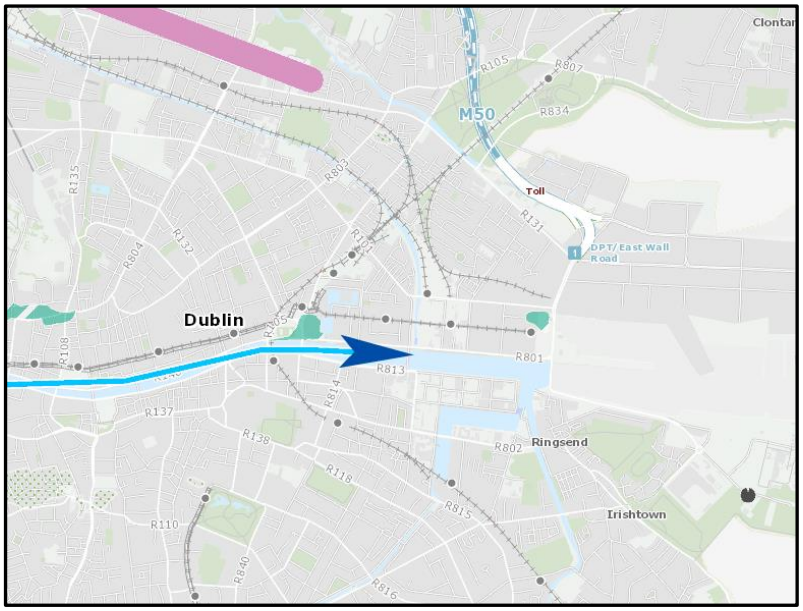
Intergranular permeability is found in sediments, sands, gravels and clays. Fissure permeability is found in bedrock, where water moves through (and in stored in) cracks, fissures, planes and solution openings.

When considering groundwater, it is important to consider the underlying geology, its complexity including faults, the large amounts of water and rainfall available for recharge and the overlying Quaternary deposits.

The Geological Survey of Ireland has devised a system for classifying the aquifers in Ireland based on the hydrogeological characteristics, size and productivity of the groundwater resource. The three main classifications are Regionally Important Aquifers, Locally Important Aquifers and Poor Aquifers.

The bedrock underlying the study area is classified by the GSI as a locally important aquifer bedrock which is moderately productive only in Local Zones. Groundwater vulnerability is Low.

Figure 7.3: Extract from GSI Quaternary Mapping



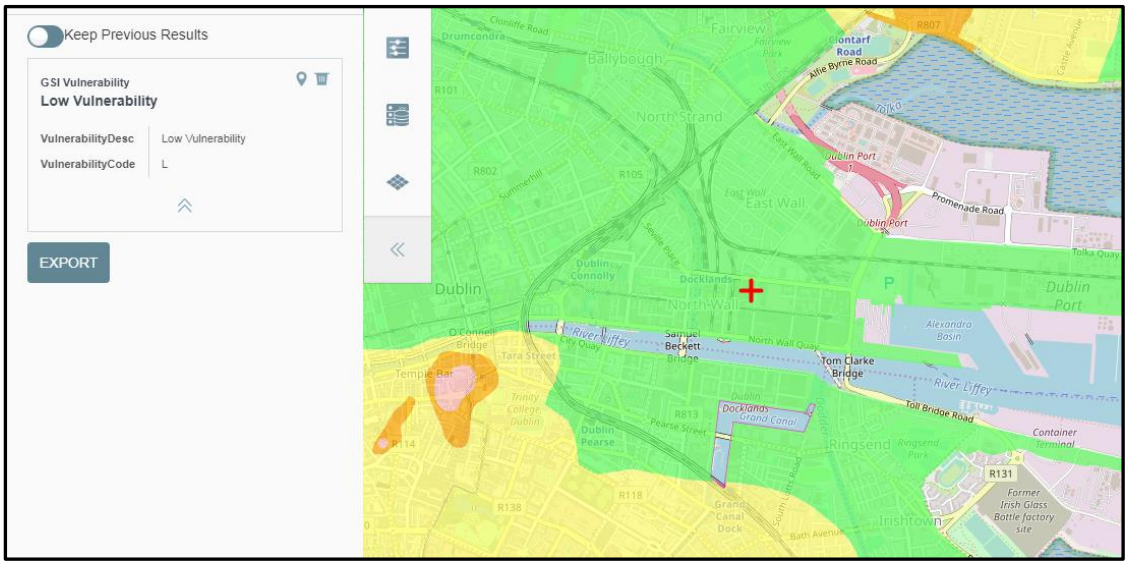
There are no groundwater wells or springs recorded on the GSI Quaternary mapping on or near the site.

Groundwater vulnerability

Aquifer or groundwater vulnerability is a relative measure of the ease with which the groundwater could be contaminated by human activity and depends on the aquifer's intrinsic geological and hydrogeological characteristics. The vulnerability is determined by the permeability of any overlying deposits. For example, bedrock with a thick, low permeability, clay-rich overburden is less vulnerable than bedrock with a thin, high permeability, gravelly overburden.

Groundwater vulnerability categories are defined by the GSI as – Extreme rock at or near surface or karst (X), Extreme (E), High (H), Moderate (M) and Low (L) for mapping purposes and in the assessment of risk to ground waters. The classifications are based on the thickness and permeability of the sub-soils overlying the aquifer. The GSI has classified the aquifer vulnerability underlying the site as Low.

Figure 7.4: Extract from GSI Groundwater Vulnerability Mapping



Site Hydrogeology

Site investigation data shows the groundwater levels below the site at the time of investigation to range from approximately 3.00 to 5.00m below ground level across the site. The results of the groundwater gauging exercise indicated the likely presence of a continuous shallow groundwater table within the overburden soils encountered beneath the site. The depth of the water table ranged between -0.221 mSTD and -0.176 mSTD. Groundwater in the shallow perched aquifer has been estimated to flow in a south easterly direction towards the River Liffey and is likely to be tidally influenced.

Groundwater Quality

Under the requirements of the Water Framework Directive, the Dublin groundwater body was classified as having an overall good status for water quality and quantity 2010-2015. However, it is classified as 'at risk' of not achieving at least good ecological or good chemical status/potential by2015. No site-specific water quality data is available from the site investigation.

Groundwater Flood Risk

Groundwater flooding can occur during lengthy periods of heavy rainfall, typically during later winter/early spring when the groundwater table is already high. If the groundwater level rises above surface level, it can pond at local points and cause periods of flooding. As stated in above, groundwater levels were found to range between approximately 3.00 to 5.00m below ground level, however this could also represent rainfall which cannot drain quickly enough through the low permeability till. The risk of groundwater flooding is therefore considered to be low to medium on the site.
The majority of the site will be covered in hard standing and a Sustainable Drainage System – (SuDS) will be incorporated into the completed development, therefore reducing the infiltration risk at the site. This is further detailed in Section 8.4.3 below, in which the infiltration will be greatly attenuated in the site.

7.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Planning permission is being sought for a mixed-use residential development at Spencer North SHD. The proposed development is a modification to permitted development Ref. DSDZ2896/18 as amended by Ref. DSDZ4279/18.
The proposed development seeks revisions to the permitted Block 1 and 2 to provide for an increase in the number of residential units from 349 no. to 464 no. apartment units and the change of use of the permitted aparthotel development to 109 co-living units.
The proposed development will increase the height of the permitted development increasing the maximum height of Block 1 from 7 no. storeys (27.5 m) to a maximum height of 13 no. storeys (46.8m) and increasing the maximum height of Block 2 (27.5m) to 11 no. storeys (40.5m). The proposed development will also include the provision of a link bridge between Block 1 and Block 2 at 6th floor level, landscaping, the provision of communal open space, revised under croft level, provision of roof terraces and all other associates site development works to facilitate the development.
Block 1 (northern block) will now comprise the following:

- Residential units extending 9-13 storeys high over lower-ground and basement levels, set around a central courtyard.
- The eastern (New Wapping Street) street elevation stands 10-11 storeys high with the upper two storeys partially set back.
- The western elevation stands 11 storeys high, with a partial set-back of the upper two storeys, while extending further to 13 storeys in the northern corner.
- The southern elevation stands 11 storeys high over lower-ground level.
- The northern (Sheriff Street) elevation stands 9-13 storeys high, with eleven and thirteen storeys accentuating the northern corners of the block.
- All elevations support an extensive matrix of windows and balconies.

Block 2 (southern block) will now comprise the following:

- Residential units plus co-living units extending 7-11 storeys high over lower-ground floor and basement levels, set around a central courtyard.
- The eastern (New Wapping Street) elevation extends to 7-9 storeys over lower ground floor, incorporating partial set-backs to the top one or two storeys, and a three-storey over lower-ground 'wing' facing the neighbouring existing houses.
- The western elevation extends 9-11 storeys high with a partial set-back to the ninth storey.
- The southern (Mayor Street Upper) elevation is largely confined to the south-western corner of the block, extending to ten storeys high with a five-storey 'wing' facing the neighbouring existing houses. The remainder of the elevation is substantially set-back within the site, behind the existing houses, standing three storeys over lower ground with a further four storeys set back behind.
- The northern elevation extends 7–11 storeys high over lower–ground level

- All elevations support an extensive matrix of windows, and balconies occur throughout except for the co-living units. The south-facing elevation behind the existing houses has almost no windows but with detailing that echoes the scale and rhythm of fenestration elsewhere.

A glazed bridge links the two blocks at the sixth floor (seventh storey) connecting internal amenity spaces.

It is envisaged that all structural loads will be carried to either bedrock or the over-lying layers of stiff brown clay, by use of piled foundations. These will generally be situated beneath load bearing walls.

Surplus materials from these excavations will be disposed of off-site.

7.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

The predicted impacts of the proposed development with regard to the soil environment will be assessed for the construction and operational phases.

7.5.1 Construction Phase

It is anticipated that the development site works, and excavation proposals will not be deep enough to impact the underlying bedrock geology during the construction phase. It is therefore considered that the greatest impact of the construction will arise from the extensive stripping and wide scale excavation of soils and sub-soils to prepare and construct the development.

Significant earthworks will be required to facilitate the construction of a basement at the site. This excavation will remove the majority of made ground underlying the site. Elevated concentrations of some contaminating compounds were reported in the made ground to depths of 3mbgl. The excavation of the made ground will likely have a positive, permanent impact on the land and soils at the site as impacted made ground will be removed. The excavation of the made ground will likely have a positive, permanent impact on the shallow groundwater aquifer at the site as this will remove any potential source of groundwater contamination.

Reusable excavated soils and rock will be retained on-site for backfilling or drainage purposes to reduce the total volume of imported material. It is anticipated that the impact on soils arising from the construction phase will be short term and moderate.
In addition, the installation of the proposed surface water storage structures will require a significant quantity of subsoil to be excavated to provide sufficient storage volumes for storm events.
The below ground long-term storage basin proposed as part of the water attenuation scheme will be constructed using suitable excavated material, with the ground floor level above.

Earthworks and the removal of topsoil would expose subsoil layers to the effects of weathering and may result in the erosion of soil, particularly in times of adverse weather conditions. Surplus subsoil caused by excavations for foundations, roads and drainage should be stockpiled and taken off-site to a licensed landfill facility.

During the excavation works, subsoil will be exposed to construction plant traffic which could lead to a negative, short term impact on the land and soils. The regular movement of heavy machinery and plant to and from the site would also result in an increased risk to the integrity of the surrounding road network, as well as facilitating the unwelcome transfer of mud and dust to surrounding access routes.

Shallow groundwater will be dewatered to facilitate plant access during the excavation works. It is likely this dewatering will remove any localised areas of contaminates reported in the shallow aquifer underlying the site. The removal of impacted groundwater will likely have a permanent effect. During the construction works at the site, significant volumes of construction traffic including heavy plant and construction equipment will be present at the site. There is the potential for leaks and spills of fuel and lubricating oils to have a moderate, short term, temporary impact to the and soils at the site.

It will be necessary to import materials to site; in particular large volumes of stone will be required for construction of the roads, foundations and services. Also, large quantities of concrete, bricks, steel, tar etc. will all be delivered to site by lorry. Road levels have been designed in accordance with TII Design Manual for Roads and Bridges (DMRB) as well as the Design Manual for Urban Roads and Streets (DMURS), with an aim to balance cut and fill earthworks throughout the site.

There is a potential risk of localised contamination from construction materials leaching into the underlying soils by exposure, dewatering or construction related spillages resulting in a Permanent Negative impact on the soils. In the case of soils, the magnitude of this impact is Small Adverse as it may result in the requirement to excavate/remediate a small proportion of contamination or result in a low risk of pollution to the soils. As a result, its significance is Imperceptible for all important soils features.

There is a potential risk of localised contamination of the groundwater due to construction activities i.e. construction spillages, leaks etc. resulting in a Permanent Negative impact on the groundwater. This gravelly clay will limit the potential for contamination to infiltrate into the underlying aquifer. No excavations are anticipated to take place into the bedrock. For these reasons, the impact is Negligible on the groundwater contained within the bedrock aquifer. As a result, its significance is imperceptible.

The potential likely and significant impact on hydrogeology during the construction phase is considered to be short term, temporary and moderate without mitigation measures in place.

7.5.2 OPERATIONAL PHASE

The day-to-day activities of the completed development would be unlikely to have any direct impact on the groundwater environment. Minor impacts may include reduced infiltration and therefore reduced recharge volumes entering the groundwater. This is directly related to the creation of impermeable development areas which pending their arrangement could increase run-off volumes and reduce existing infiltration potential. The risk of spills or leaks of fuels and oils from residential vehicles may impact if the surface water system is not designed to address this.

On completion of the construction phase, it is not envisaged that there would be a further direct impact on the soil or geology structure. Ensuring appropriately designed and constructed site services will protect the soils and geology from future contamination arising from operation of the developments.

The impacts on soils and geology arising from the operational phase will be temporary and imperceptible.

7.6 POTENTIAL CUMULATIVE IMPACTS

The potential cumulative impacts of the proposed redevelopment of the site represent a permanent, local positive impact to the land and soil/ water environment. The excavation and off-site disposal of impacted made ground at the site removes a potential source of contamination which could impact upon future site users along with the land and soils at the site.

7.7 DO NOTHING IMPACT

If the proposed development at the site did not proceed, a potential source of contamination (impacted made ground) would remain in-situ. This source of contamination could migrate laterally and vertically, potentially impacting off-site receptors and the water environment.

7.8 REMEDIAL AND MITIGATION MEASURES

7.8.1 Construction Phase

In order to minimize the impact of construction on the site's land, soils and geology the following mitigation measures should be implemented.

L&S CONST 1:

- Top-soiling and landscaping of the works should take place as soon as finished levels are achieved, in order to reduce weathering and erosion and to retain soil properties.
- The provision of wheel wash facilities close to the site entrance to reduce the deposition of mud, soils and other substances on the surrounding road network.
- The construction phase should be monitored, in particular in relation to the following;
  - Adequate protection from contamination of soils for removal;
  - Cleanliness of adjoining road network;
  - Prevention of oil and petrol spillages;
  - Dust control.
- Where feasible, the extent of excavation works and depths for buildings and roads should be limited through design to minimize disturbance of the original soil and subsoil formations and to retain soil structure. This will also help to reduce the volumes of backfill and material to be removed off-site.
- Reusable excavated gravels, sands or rock should be retained on-site for backfilling or drainage purposes to reduce the total volume of imported material. Rock should be retained on site where feasible.
- Should material appear to be contaminated, soil samples should be analysed by an appropriate testing laboratory. Contaminated material should be treated in accordance with the Waste Management Regulations, 1998.
- Excess fill, unsuitable material and suitable material will be removed off-site. Removal should be in accordance with the relevant Waste Management Regulations.

- Oil and fuel stored on site should be stored in designated areas. These areas shall be bunded and should be located away from surface water drainage.
- Refueling of construction machinery shall be undertaken in designated areas located away from surface water drainage. Spill kits shall be kept in these areas in the event of spillages.
- Hazardous waste shall be dealt with in accordance with the Waste Management (Hazardous Waste) Regulations, 1998.
- All potentially hazardous materials shall be securely stored on site.

7.8.2 Operational Phase

No significant long-term impact on the soil resulting from the proposed operational phase of the development is predicted. Once the development is completed, risks to the land and soils will be from pollutants deriving from the use of the apartment buildings and/or from contaminated surface water run-off.

L&S OPERAT 1: The surface water run-off from the development should be collected by an appropriately designed system. This system should ensure that contaminants are removed prior to discharge e.g. via a light liquids separator or by an appropriate treatment train of Sustainable Urban Drainage Systems as outlined in the Greater Dublin Strategic Drainage Study (GDSDS). Any separators and drainage systems should be maintained and operated by the facilities management company (prior to taking in charge by the Local Authority) in accordance with the manufacturers recommendations.

L&S OPERAT 2: All waste generated by the everyday operation of the development should be securely stored within designated collection areas. These should have positive drainage collection systems to collect potential run off. Operational waste should be removed from site using licensed waste management contractors.

7.9 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

Construction Phase

The proposed development will alter the current land use to a residential development with landscape areas. The impact on land, soil, geology and hydrogeology from accidental spillages of fuel and lubricants used during the construction phase of the development is predicted to be minimal when stored and used in a responsible manner. After implementation of the mitigation measures recommended above for the construction phase, the proposed development will not give rise to any significant long-term adverse impact. Moderate negative impacts during the construction phase will be short term only in duration.

Operational Phase

There are no long-term impacts on soils.

7.10 MONITORING

A monitoring system will be in place during the excavation works to track the transportation and disposal pathway of waste material generated during the excavation of the basement.

7.11 REINSTATEMENT

Where possible, excavated material generated at the site will be used to back fil service trenches and along the sides of the basement. Following completion of the development works at the site there will be no requirements for reinstatement works for land and soils.

7.12 INTERACTIONS

The design team has been in regular contact with each other throughout the design process to minimise environmental impacts and to ensure a sustainable and integrated approach to the design of the proposed development. There is an interaction between soil and waste management which may require the removal of soil off site to a suitable licensed facility. There is an interaction between geology for the site and hydrogeology and biodiversity, as discussed above and in the Water and Biodiversity chapters of the EIAR.

7.13 DIFFICULTIES ENCOUNTERED IN COMPILING

No particular difficulties were encountered in completing this section.

7.14 REFERENCE

- Site Investigations Report – RSK Ireland Limited, Generic Quantitative Risk Assessment (GQRA), report reference 602010-R04 (May 2018);
- CS Consulting Ltd, Engineering Services Report, Spencer Place Residential Block 2, report reference R043 (March 2019);
- CS Consulting Ltd, Site Specific Flood Risk Assessment, Spencer Place Residential Block 2, report reference R043 (March 2019);
- Geological Survey of Ireland (GSI) online maps and databases;
- EPA online maps and databases.

Chapter 8:
Water

8.0 Water

8.1 Introduction

Author: Paul Feely, (BSc, MSc, FGS)

This chapter of the EIAR assesses the impacts of the proposed development, at the Spencer North SHD, on surface water drainage, foul water drainage and water supply in the area. This section should be read in conjunction with the architectural drawings for the development & the project description sections of this EIAR.

Existing:

The Site is located at the junction of Sherriff Street and New Wapping Street, Spencer Place, Dublin 1. The Site has an approximate area of 0.75 hectares and is centred on Irish Grid reference O 176 346. The majority of the Site is currently vacant, a Dublin City Council sewage pumping station is located in the central section of the Site. A review of available historical maps indicates the Site was largely undeveloped until 1907 when it was utilised as a timber yard. Prior to this the Site had some residential properties along the south-east section of the Site.

Land use surrounding the site is predominately commercial and residential in nature. The Site is bound to the north by Sheriff Street Upper, with an office/residential apartment complex and terraced housing beyond. The closest residential properties are approximately 20m north of the Site. Railway sidings are present approximately 100m to the northeast and 150m to the north of the Site. A number of terraced residential properties are located on the south eastern Site boundary. Mayor Street forms the remainder of the southern Site boundary. New Wapping Street forms the eastern Site boundary, with a number of terraced residential properties located on the eastern side of the street. The currently undeveloped western half of City Block 3 is immediately west of the Site. An access road to apartment complexes is located beyond.

Proposed:

Planning permission is being sought for a mixed-use residential development at Spencer North SHD. The proposed development is a modification to permitted development Ref. DSDZ2896/18 as amended by Ref. DSDZ4279/18.

The existing permission provides for 349 residential units and a 100-bedroom aparthotel, assembled as two blocks that each extend to seven storeys, with a commercial-height ground floor (including mezzanine) over basement car parking. Landscaped communal amenity space is provided within courtyards at the centre of each block, along with landscaped public street-frontages and a central public space. A new street will also run from north to south along the western edge of the site, bisecting City Block 2.

The proposed development seeks revisions to the permitted Block 1 and 2 to provide for an increase in the number of residential units from 349 no. to 464 no. apartment units and the change of use of the permitted aparthotel development to 109 co-living units.
The proposed development will increase the height of the permitted development increasing the maximum height of Block 1 from 7 no. storeys (27.5 m) to a maximum height of 13 no. storeys (46.8m) and increasing the maximum height of Block 2 (27.5m) to 11 no. storeys (40.5m). The proposed development will also include the provision of a link bridge between Block 1 and Block 2 at 6th floor level, landscaping, the provision of communal open space, revised under croft level, provision of roof terraces and all other associates site development works to facilitate the development.

Block 1 (northern block) will now comprise the following:

- Residential units extending 9-13 storeys high over lower-ground and basement levels, set around a central courtyard.
- The eastern (New Wapping Street) street elevation stands 10-11 storeys high with the upper two storeys partially set back.
- The western elevation stands 11 storeys high, with a partial set-back of the upper two storeys, while extending further to 13 storeys in the northern corner.
- The southern elevation stands 11 storeys high over lower-ground level.
- The northern (Sheriff Street) elevation stands 9-13 storeys high, with eleven and thirteen storeys accentuating the northern corners of the block.
- All elevations support an extensive matrix of windows and balconies.

Block 2 (southern block) will now comprise the following:

- Residential units plus co-living units extending 7-11 storeys high over lower-ground floor and basement levels, set around a central courtyard.
- The eastern (New Wapping Street) elevation extends to 7-9 storeys over lower ground floor, incorporating partial set-backs to the top one or two storeys, and a three-storey over lower-ground 'wing' facing the neighbouring existing houses.
- The western elevation extends 9-11 storeys high with a partial set-back to the ninth storey.
- The southern (Mayor Street Upper) elevation is largely confined to the south-western corner of the block, extending to ten storeys high with a five-storey 'wing' facing the neighbouring existing houses. The remainder of the elevation is substantially set-back within the site, behind the existing houses, standing three storeys over lower ground with a further four storeys set back behind.
- The northern elevation extends 7-11 storeys high over lower-ground level
- All elevations support an extensive matrix of windows, and balconies occur throughout except for the co-living units. The south-facing elevation behind the existing houses has almost no windows but with detailing that echoes the scale and rhythm of fenestration elsewhere.

A glazed bridge links the two blocks at the sixth floor (seventh storey) connecting internal amenity spaces.

Figure 8.1.1 – Site Location

8.2 Study Methodology

The assessment of the potential impact of the proposed development on the water bodies was carried out according to the methodology specified by the EPA and the specific criteria set out in the Guidelines on Information to be Contained in an Environmental Impact Statement (EPA 2002 and 2017 (Draft)), EIA Directive 2014/EU/52, Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003), Environmental Impact Assessment (EIA), Guidance for Consent Authorities Regarding Sub-Threshold Development (DoEHLG 2003), Development Management Guidelines (DoEHLG, 2007) and Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessments August 2018.

The following sources of information were used in the completion of this assessment:

- Site Visit
- RSK Ireland Limited, Generic Quantitative Risk Assessment (GQRA), report reference 602010 R04 (May 2018)
- AWN Consulting, Hydrological & Hydrogeological Qualitative Risk Assessment for Proposed Development at Spencer Place Block 2, Spencer Dock D1, report reference TH/19/11083SR01 (August 2018)
- CS Consulting Ltd, Engineering Services Report, Spencer Place Residential Block 2, report reference R043 (March 2019)
- CS Consulting Ltd, Site Specific Flood Risk Assessment, Spencer Place Residential Block 2, report reference R043 (March 2019)
- Geological Survey of Ireland (GSI) online maps and databases
- Eastern CFRAMS Flood Mapping from OPW
- EPA online maps and databases
- Topographical Survey
- Local authority record drawings

All drainage (surface and foul) and water supply will be provided in accordance with the requirements of Dublin City County Council, Irish Water and in particular in accordance with the following:

- Greater Dublin Regional Code of Practice for Drainage Works
- Greater Dublin Strategic Drainage Study (GDSDS)
- Planning System and Flood Risk Management Guidelines
- Building Regulations (Part H)
- Irish Water Standard Details and Codes of Practice for Water and Wastewater Infrastructure
- CIRIA SuDS manual C753 (2015).

This chapter also encompasses knowledge obtained from site visits, drainage and water services record information received from Irish Water and the Local Authority. Additionally, information from the EPA and GSI websites has been utilised.

8.3 The Existing Receiving Environment

The Site is located at the junction of Sherriff Street and New Wapping Street, Spencer Place, Dublin 1. The Site has an approximate area of 0.75 hectares and is centred on Irish Grid reference O 176 346. The majority of the Site is currently vacant, a Dublin City Council sewage pumping station is located in the central section of the Site. A review of available historical maps indicates the Site was largely undeveloped until 1907 when it was utilised as a timber yard. Prior to this the Site had some residential properties along the south-east section of the Site.

Land use surrounding the site is predominately commercial and residential in nature. The Site is bound to the north by Sheriff Street Upper, with an office/residential apartment complex and terraced housing beyond. The closest residential properties are approximately 20m north of the Site. Railway sidings are present approximately 100m to the northeast and 150m to the north of the Site. A number of terraced residential properties are located on the south eastern Site boundary. Mayor Street forms the remainder of the southern Site boundary. New Wapping Street forms the eastern Site boundary, with a number of terraced residential properties located on the eastern side of the street. The currently undeveloped western half of City Block 3 is immediately west of the Site. An access road to apartment complexes is located beyond. The closest residential properties are approximately 200m west of the Site.

The nearest surface watercourse is the River Liffey approximately 200 m to the south of the site. The river water quality status for the River Liffey at this location is classified by the EPA as “unpolluted”. The Royal Canal flows further west of the site. This is fully lined and has no connectivity with the site.

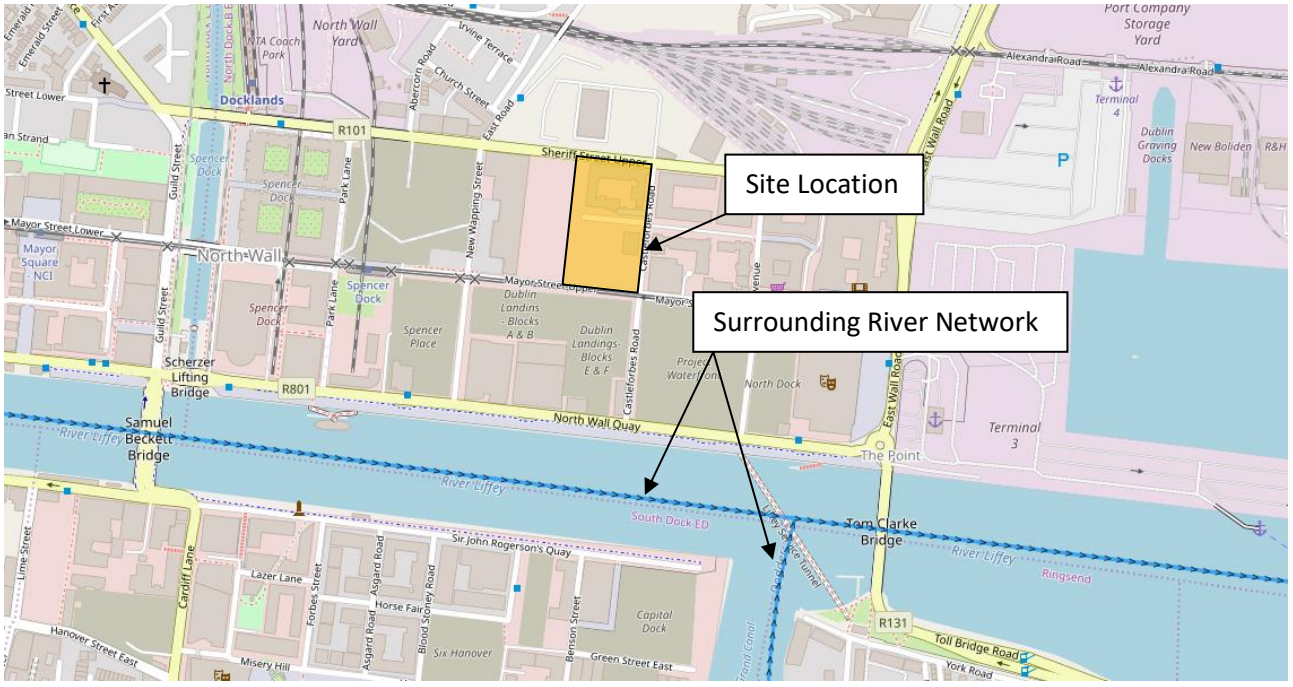
8.3.2 Surface Water

There are no surface waters within or adjacent to the site boundaries.

8.3.2.1 River LIffey

The main freshwater watercourse within the vicinity of the proposed development site is the River Liffey, located approximately 200m to the south of the site flowing in a west to east direction before draining in to the Irish Sea approximately 4km to the east of the site. Figure 8.1 below, taken from EPA mapping outlines the river systems in the vicinity of the site.

Figure 8.1: River Systems in the Vicinity of the Site (from EPA Website)



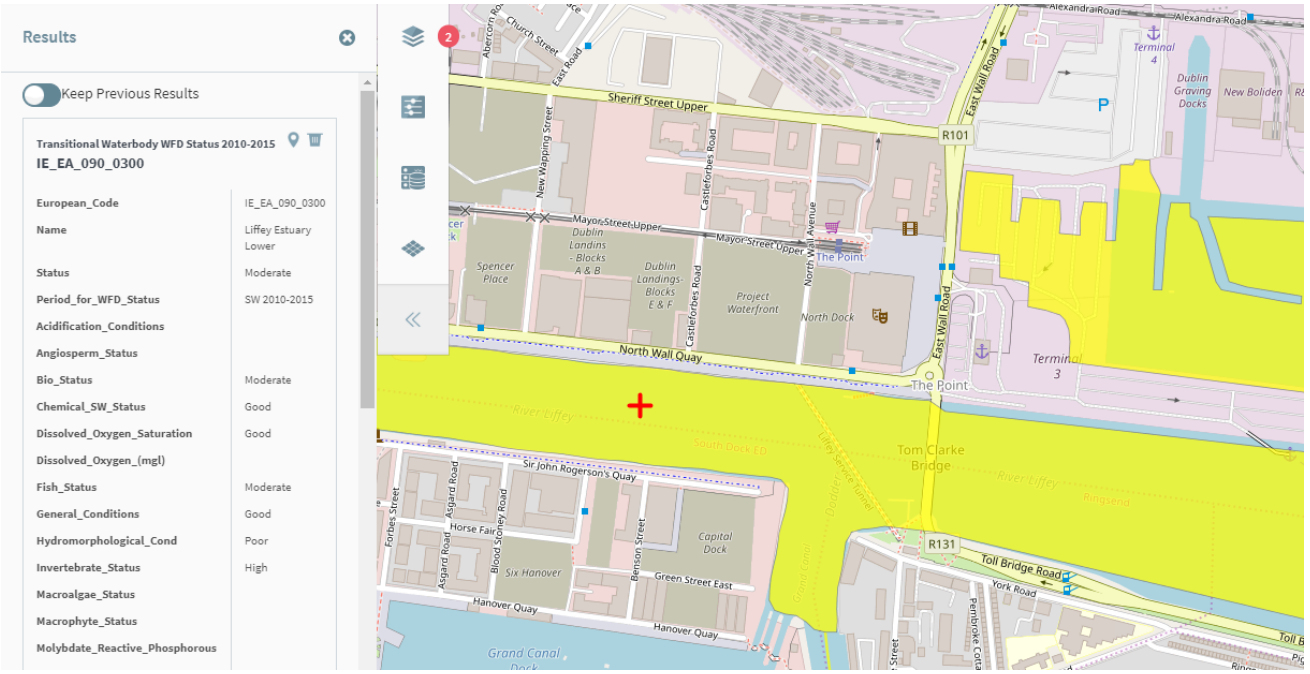
In total the Liffey has a catchment area of 1,616km^2. This catchment includes the area drained by the River Liffey and by all streams entering tidal water between Sea Mount and Sorrento Point, Co. Dublin.

The proposed development site is within the Eastern River Basin District which is the Water Framework Directive designated catchment for this area.

The WFD classification scheme for water quality includes five status classes: high, good, moderate, poor and bad. 'High status' is defined as the biological, chemical and morphological conditions associated with no or very low human pressure. This is also called the 'reference condition' as it is the best status achievable - the benchmark. These reference conditions are type-specific, so they are different for different types of rivers, lakes or coastal waters so as to take into account the broad diversity of ecological regions in Europe.

Assessment of quality is based on the extent of deviation from these reference conditions, following the definitions in the Directive. 'Good status' means 'slight' deviation, 'moderate status' means 'moderate' deviation, and so on. The definition of ecological status takes into account specific aspects of the biological quality elements, for example "composition and abundance of aquatic flora" or "composition, abundance and age structure of fish fauna.
The River Liffey in the vicinity of the site is categorised as a transitional waterbody. EPA sampling of watercourses dating from 2010-2015 indicate that the River Liffey had a 'moderate' status. Refer to the water quality map, included as Figure 8.2 below.

Figure 8.2: EPA Water Quality Map for River Liffey in the Vicinity of the Site



Information available from the EPA suggests that the River Liffey is "at risk of not achieving good water status" in terms of the WFD. The water quality within the designated water courses will be particularly affected by the quantity and quality of surface water run-off from the adjacent lands. Currently the lands are urban in use. The most recent surface water quality data for the Liffey and Dublin Bay (2010-2012) indicate that they are 'Unpolluted'. Under the 2015 'Trophic Status Assessment Scheme' classification of the EPA, 'Unpolluted' means there have been no breaches of the EPA's threshold values for nutrient enrichment, accelerated plant growth, or disturbance of the level of dissolved oxygen normally present. Annual precipitation for this area is approximately 687mm (2018 figures from Met Eireann website).

As part of the GQRA undertaken by RSK in 2018, one round of surface water monitoring was undertaken, three surface water samples were recovered from the River Liffey and were analysed for a suite of selected metals. The surface water results have been compared to the GAC for the protection of a controlled freshwater environment. Laboratory analysis reported all contaminants at concentrations below the laboratory detection limit or below the adopted GAC. Whilst elevated levels of TPH, arsenic, lead, zinc, naphthalene and benzo(a)pyrene were reported in shallow groundwater at the Site, these elevated concentrations do not appear to be impacting the River Liffey.

8.3.3.2 Flood Risk

The Eastern Catchment Flood Risk and Management Study (ECFRAMS), completed by the office of public works (OPW) identifies flood zones. The development site lies entirely within Flood Zone C i.e. where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding).
However, the CS Consulting Flood Risk Assessment (FRA) for the site (Report ref: R043) notes that, as part of Dublin City Councils recently adopted development plan, Dublin City Development Plan 2016-2022, a Strategic Flood Risk Assessment (SFRA) was issued, giving guidance for areas of the city which have been deemed to be located in potentially vulnerable areas to flooding. The flood maps indicated that the subject site is located in Flood Zone A.

The CS Consulting report goes on to state that the proposed nature of the development (residential) designates the development to be classified as highly vulnerable in accordance with OPW Planning Guidelines for Local Authorities. With the site being located in Flood Zone A requires a Justification Test for Development

Management to be carried out to establish the potential for the site to be affected by extreme flooding events. The site was reviewed for pluvial/fluvial/groundwater and infrastructure flooding sources and any risk associated risk is deemed to be within acceptable limits.

The sites vulnerability as indicated by Dublin City Councils Strategic Flood Risk Assessment is the predicted effects of extreme tidal flooding should the recently installed flood defences fail. The predicted risks have been assessed and the nature of the proposed development combined with the ability to predict high tides due to monitoring devices currently in place in addition to the fact that the proposed development will have a finished floor level set at 4.0mAOD, as per the requirements of North Lotts & Grand Canal Planning Scheme, deems the potential tidal flood risk to be within acceptable limits.
The close proximity of the North Lotts Pumping Station and associated infrastructure has been assessed to identify if the proposed development would affect the existing Pumping Station during a flood event or if the Pumping station would impact the proposed development. The review indicated that as the proposed development and the existing Pumping Station are not connected that the likelihood of flooding arising from the proposed development or from the Pumping Station affecting each other is negligible and deemed low risk

8.3.4 Surface Water Sewers

There are no surface water sewers located within the site boundary.

8.3.5 Existing Foul Water Drainage

Records obtained from Dublin City Council indicate a number of public sewers adjacent to the subject lands, namely;

- A1000-brick culvert combined sewer to the West;
- A940-brick culvert combined sewer to the East, flowing North on New Wapping Street.

These sewers ultimately drain to the Ringsend WWTP at Ringsend. As part of the Greater Dublin Strategic Drainage Study (DCC 2005) a comprehensive review of the public drainage network in the greater Dublin area was carried by Dublin City Council. An aspect of these works was to assess the public drainage infrastructure for its current and future hydraulic performance. A number of maps were published giving an indication of the predicated hydraulic performance up to 2031. The report modelling indicated that the combined sewer on New Wapping Street surcharges for a 1-to2-year return period but does not flood for 1-in 30-year events or less.

8.3.6 Existing Water Supply

There is currently no water supply infrastructure within the subject site. According to Irish Water records obtained by CS Consulting (Report Ref. R043), there is existing watermains located along New Wapping Street. It is assumed that there is an existing watermain connection to the North Lotts however this will not be utilised as part of the new development. A new connection(s) will be provided to the site for the new development.

8.4 Characteristics of the Proposed Development

Consideration of the Characteristics of the Proposed Development allows for a projection of the ‘level of impact’ on any particular aspect of the proposed environment that could arise. For this chapter the potential impact on Water is discussed.

Planning permission is being sought for a mixed-use residential development at Spencer North SHD. The proposed development is a modification to permitted development Ref. DSDZ2896/18 as amended by Ref. DSDZ4279/18.

The existing permission provides for 349 residential units and a 100 bedroom aparthotel, assembled as two blocks that each extend to seven storeys, with a commercial-height ground floor (including mezzanine) over basement car parking. Landscaped communal amenity space is provided within courtyards at the centre of each block, along with landscaped public street-frontages and a central public space. A new street will also run from north to south along the western edge of the site, bisecting City Block 2.

The proposed development seeks revisions to the permitted Block 1 and 2 to provide for an increase in the number of residential units from 349 no. to 464 no. apartment units and the change of use of the permitted aparthotel development to 109 co-living units.
The proposed development will increase the height of the permitted development increasing the maximum height of Block 1 from 7 no. storeys (27.5 m) to a maximum height of 13 no. storeys (46.8m) and increasing the maximum height of Block 2 (27.5m) to 11 no. storeys (40.5m). The proposed development will also include the provision of a link bridge between Block 1 and Block 2 at 6th floor level, landscaping, the provision of communal open space, revised under croft level, provision of roof terraces and all other associates site development works to facilitate the development.

Block 1 (northern block) will now comprise the following:

- Residential units extending 9-13 storeys high over lower-ground and basement levels, set around a central courtyard.
- The eastern (New Wapping Street) street elevation stands 10-11 storeys high with the upper two storeys partially set back.
- The western elevation stands 11 storeys high, with a partial set-back of the upper two storeys, while extending further to 13 storeys in the northern corner.
- The southern elevation stands 11 storeys high over lower-ground level.
- The northern (Sheriff Street) elevation stands 9-13 storeys high, with eleven and thirteen storeys accentuating the northern corners of the block.
- All elevations support an extensive matrix of windows and balconies.

Block 2 (southern block) will now comprise the following:

- Residential units plus co-living units extending 7-11 storeys high over lower-ground floor and basement levels, set around a central courtyard.
- The eastern (New Wapping Street) elevation extends to 7-9 storeys over lower ground floor, incorporating partial set-backs to the top one or two storeys, and a three-storey over lower-ground 'wing' facing the neighbouring existing houses.
- The western elevation extends 9-11 storeys high with a partial set-back to the ninth storey.
- The southern (Mayor Street Upper) elevation is largely confined to the south-western corner of the block, extending to ten storeys high with a five-storey 'wing' facing the neighbouring existing houses. The remainder of the elevation is substantially set-back within the site, behind the existing houses, standing three storeys over lower ground with a further four storeys set back behind.
- The northern elevation extends 7-11 storeys high over lower-ground level
- All elevations support an extensive matrix of windows, and balconies occur throughout except for the co-living units. The south-facing elevation behind the existing houses has almost no windows but with detailing that echoes the scale and rhythm of fenestration elsewhere.

A glazed bridge links the two blocks at the sixth floor (seventh storey) connecting internal amenity spaces.

8.4.1 Surface Water

The majority of the site will be under building footprints with the majority of the remainder of the site under hardstanding comprising paved area, tarmacadam and concrete surfacing. There will be limited soft

landscaping incorporated into the completed site layout. The site is 200m north of the River Liffey. Construction of foul infrastructure and site drainage systems as outlined in sections 8.4.2 and 8.4.3 will result in surface waters from site will not impact the River Liffey.

8.4.2 Foul Infrastructure

It is proposed to construct a new foul drainage network in accordance with BS EN 752, Part 'H' of the Building Regulations and the Irish Water Code of Practise for Wastewater Infrastructure.
Given the presence of the existing North Lotts Pumping Station and associated underground infrastructure, the site is essentially divided in two halves i.e. north and south of the pumping station. It is proposed to provide separate foul systems i.e. one for each side of the existing pumping station.
The Irish Water Code of Practise for Wastewater Infrastructure (clause 3.6 and Appendix D) indicate that an effluent volume of 450L/day/person and 500ltrs/day/room under hotel use is appropriate. CS consulting (Report Ref. R043) have calculated that the proposed new development will generate in the order of 267,950 litres of effluent per day (i.e.138,150ltrs/day for Block 1 and126,300ltrs/day for Block 2).

Two foul tanks and pumping chambers will be installed to cater for the volumes noted above. The basement area will be fitted with a suitable oil separator before the run-off is collected into the pumping chamber. The pumping chamber will pump to stand-off manholes where it will fall by gravity to the existing brick culvert combined sewer running south to north along New Wapping Street. The proposed effluent generated by the subject lands combined with the separation and attenuation of storm flows will have minimal impact on the receiving drainage infrastructure.

8.4.3 SUDS Measures

The principles of Sustainable Urban Drainage Systems (SUDS) are embodied in the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS). The GDSDS addresses the issue of sustainability by requiring designs to comply with a set of drainage criteria which aim to minimize the impact of urbanisation by replicating the run-off characteristics of the Greenfield site. The criteria provide a consistent approach to addressing the increase in both rate and volume of run-off as well as ensuring the environment is protected from pollution that is washed off roads and buildings.

The existing site layout is almost entirely hardstanding, with unattenuated outflow to the public drainage network. The proposed development will be designed in accordance with the principles of SuDS and will significantly reduce run-off rates and improve storm water quality discharging to the public storm water system.

The aim is to reduce any post development run-off to pre-development discharge rates. The development is to retain storm water volumes predicted to be experienced during extreme rainfall events. This is defined as the volume of storm water generated during a 1-in-100-yearstorm event increased by 20% for predicted climate change factors.

As noted above, the existing North Lotts Pumping Station bisects the site in two, therefore, it is proposed to provide 2no attenuation tanks at lower ground level i.e. one tank for Block 1 and one tank for Block 2. CS consulting (Report Ref. R043) have completed attenuation calculations which indicate a storage volume of 1,217m3 is required based on a site area of 12,645m2(i.e. 1.26Ha).

Furthermore, in accordance with Dublin City Councils requirements as set out in their document, North Lotts & Grand Canal Dock Planning Scheme, NLGCDPS, DCC 2014, the development must provide a minimum storm water storage of 570m^3/Ha, CS consulting (Report Ref. R043) have calculated that this leads to a requirement for a further 720m^3 (i.e. 570m3/Ha x 1.26Ha). Hence, a total attenuation volume of1,940m^3 (i.e.1217m3+ 720m^3) is required for the development based on a development area of 12,645m2 (1.26Ha). As the site is divided in two, 2 no separate attenuation tanks, each taking approximately 50% of the volume of water required are to be provided as below:-

- Block 1 - 970m^3 attenuation tank
- Block 2 - 970m^3 attenuation tank

The second aspect of the SuDs systems is to improve the quality of the stormwater before it leaves the site. Generally, a number of SuDs techniques are available to aid in the improvement of the storm water. A 'green roof' will be incorporated, as per the architects roof plan, and low water usage appliances will aid in the reduction of potable water usage. The use of an oil separator on the storm system and trapped gullies will aid the removal of harmful matter entering the public drainage network.

8.4.4 Water Supply

Two new metered connections (one for Block 1 and one for Block 2) taken from the existing public watermain located along New Wapping Street are proposed. CS Consulting (Report Ref. R043) have calculated that the average daily demand will be 244m^3 per day. The average day/peak week is 305m^3 per day. In order to mitigate actual demand, mitigating methods such as dual-flush toilet units and aerated taps will be applied.

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8.5 Potential Impact of the Proposed Development

The following provides an assessment of the potential impact on the water environment of the proposed development without mitigation measures being incorporated into the detailed design and construction phase. The mitigation measures and predicted impact of the proposed development are set out below.

8.5.1 Surface Water

8.5.1.1 Construction Phase

Potential impacts during the construction of the proposed development include the following:

- Significant earthworks will be required to facilitate the construction of a basement at the Site. This excavation will remove the majority of made ground underlying the Site. Elevated concentrations of some contaminating compounds were reported in the made ground to depths of 3m below ground level. The excavation of the made ground will likely have a positive, permanent impact on the shallow groundwater aquifer at the site as this will remove a potential source of groundwater contamination and have a positive permanent effect on any potential receiving surface waters.
- During excavation works shallow groundwater will be dewatered to facilitate plant access. It is likely this dewatering will remove any localised areas of contaminants reported in the shallow aquifer underlying the site. The removal of impacted groundwater will likely have a permanent positive effect on receiving surface waters.
- Significant volumes of construction traffic including heavy plant and construction equipment will be present at the site. There is the potential for leaks and spills of fuel and lubricating oils to have a moderate. short term, temporary impact to any receiving surface water in the vicinity of the site. There is perceptible risk of localised spillage to surface water as stated in the AWN report TH/19/11083SR01.
- Surface water runoff from the construction phase may also contain increased silt levels associated with the construction process. Increased silt levels have the potential to reduce water quality in any receiving surface waters.

The potential impact from the construction phase on surface water is likely to be short term and moderate without mitigation measures in place which coincides with the AWN Consulting report TH/19/11083SR01.

8.5.1.2 Operational Phase

There are currently no SUDS measures in place on site. There will be an impact on the surface water in the area due to the new development. However, the proposed surface water system detailed in sections 8.4.2 and 8.4.3 will ensure the impact from the operational phase on surface water will be minimal and constitute significant improvement from existing conditions where there is currently no drainage or sewer systems in operation.

There will be a decrease in the rate of surface water run-off from the new development due to the SUDS measures proposed. Surface water run-off will also improve in quality due to these measures. There is very little risk of accidental spillages resulting in water quality issues during the operational stage.

8.5.2 Foul Water Drainage

8.5.2.1 Construction Phase

The following are the potential impacts of the proposed scheme during the construction stage:

- Mobilisation of sediments and harmful substances during the construction phase, due to exposed soil and earth movement, which may be flushed into receiving surface waters during rainfall events;
- Accidental spills of harmful substances such as petrol or oil during the delivery and storage of harmful substances or by leakages from construction machinery.

8.5.2.2 Operational Phase

The development will result in an increase in the waste water discharged from the site to the public sewer system. The foul outflow from the site will be directed to the municipal treatment plant at Ringsend. Upgrade works are needed as the plant is not currently meeting its requirements under the Urban Wastewater Treatment Directive and increased outflow from development such as the proposed development will increase loading on the Ringsend WWTP. However, planning permission has recently been granted, under Bord Order ABP-301798-18 for an expansion to the WWTP at Ringsend which will increase network capacity by 50%.
As discussed in section 8.4.2 the current surrounding foul water system has the capacity for the proposed development. The potential impact from the operational phase of the development is therefore likely to be minimal. The AWN consulting report TH/19/11083SR01 states that the foul discharge from the site would not impact on the overall water quality within Dublin Bay due to the treatment at Ringsend WWTP meaning there in no direct source-pathway linkage during the operational phase.

8.5.3 Water Supply

8.5.3.1 Construction Phase

Provision of a new water main distribution network would involve construction activities within the subject lands mainly involving trench excavations conducted in parallel with the other services. During the connection of new mains to existing mains off-site there is a small risk that contamination of the existing supply may occur. The potential impact on the local public water supply network would be short term and imperceptible.

8.5.3.2 Operational Phase

The new development will have an increase in the water supply demand. The impact of the operational phase of the proposed development on the public water supply is likely to be to increase the demand on the existing supply by approximately 244m^3/day. As such additional water quantities would need to be treated and supplied through the existing network to the site. This will require extra cost as well as increasing abstraction

volumes from the existing source. The potential impact of the proposed development on the public water supply network is likely to be long term and minimal which is further stated in the AWN consulting report TH/19/11083SR01.

8.6 Potential Cumulative Impacts

Given the scale of the proposed residential development, in keeping with similar developments in the vicinity, and the capacity of the surrounding environment to accommodate a development of this nature, it is not likely to give rise to any significant effects cumulatively or, in combination with, other developments in the area.

8.7 Do Nothing Impact

8.7.1 Surface Water

If the proposed development at the site did not proceed, a potential source of contamination (impacted made ground deposits) would remain in-situ. This source of contamination could migrate laterally and vertically, potentially impacting off-site receptors and the water environment.

If the proposed development were not constructed there would be no effect on the existing surface water network and storm water from the lands will continue to be discharged to the adjoining sewerage system without attenuation or SUDs measures in place.

8.7.2 Foul Water Drainage

As there are no foul water systems on the site, if the proposed development were not constructed there would be no effect on the existing foul water network.

8.7.3 Water Supply

If the proposed development were not to go ahead there would be no increase in the demand on the existing water supply network.

8.8 Remedial and Mitigation Measures

Remedial and mitigation measures describe any corrective measures that are either practicable or reasonable, having regard to the potential impacts discussed above. This includes avoidance, reduction and remedy measures as per the guidance set out in Section 4.7 of the Development Management Guidelines 2007 to reduce or eliminate any significant adverse impacts identified.

8.8.1 Surface Water

8.8.1.1 Construction Phase

The following remedial or reductive measures to mitigate the impact of the construction phase on the existing environment are proposed with reference to water:

8.8.1.1.1 Surface Water Construction Stage Measures to be Implemented:

- A method statement for all works to be carried out will be prepared by the contractor and agreed with Dublin City County Council prior to commencement of works to outline what measures are to be taken to ensure there is no loss of service during the works;
- Dewatering measures should only be employed where necessary;
- If concrete mixing is carried out on site, the mixing plant should be sited in a designated area with an impervious surface;
- Existing surface drainage channels within the lands that serve adjacent lands should be retained where possible to prevent causing increased flooding impacts;

- Construction methods used should be tailored to reduce, as much as possible, dust and noise pollution;
- Comprehensive traffic management procedures, including the provision of access to all roads, and access/egress points should be prepared and agreed with the Local Authority. These traffic management measures should be implemented at times when traffic disruption may be experienced;
- Road sweeping and/or wheel wash facilities should be provided, as required;
- All oils/diesel stored on site for construction equipment are to be located in appropriately bunded areas;
- Filters and silt traps will be used to prevent rain washing silts and other materials into the surface water network and creating blockages.
- Watercourses/groundwater need to be protected from sedimentation and erosion due to direct surface water runoff generated onsite during the construction phase. To prevent this from occurring surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete.

8.8.1.2 Operational Phase

The following mitigation measures are proposed for the operational phase of the proposed development with reference to water:

8.8.1.2.1 Surface Water Operational Stage Measures to be Implemented:

- Water Quality: SuDs measures outlined in section 8.4.3 will reduce quantities and improve the quality of surface water run-off from the site.

8.8.2 Foul Water Drainage

8.8.2.1 Construction Phase

Effluent generated on the site from the contractor's sanitary facilities will be discharged to a holding tank and removed off site by a certified waste removal contractor in accordance with the requirements of the Waste Management Act of 1996 and 2001. Any other arrangements would be subject to agreement with DCC Drainage Division.

The following remedial or reductive measures to mitigate the impact of the construction phase on the existing environment are proposed: -

8.8.2.1.1 Foul Water Drainage Construction Stage Measures to be Implemented:

- Road sweeping and/or wheel wash facilities should be provided, as required;
- All onsite sewers should be tested and surveyed prior to connection to the public sewer to prevent any possibility of ingress of ground water;
- All sewers will be inspected and where necessary sealed to ensure that uncontrolled ground water inflow does not occur;
- Any leakage from the foul sewer will be cordoned off and the contaminated effluent and soil collected and disposed by licensed contractors.

8.8.2.2 Operational Phase

8.8.2.2.1 Foul Water Drainage Operational Stage Measures to be Implemented:

- Dual & low flush toilets will be used to reduce flows from the development.
- In order to reduce the risk of defective or leaking sewers, all new sewers should be laid in accordance with the relevant standards, pressure tested and CCTV surveyed to ascertain any possible defects.

8.8.3 Water Supply

8.8.3.1 Construction Phase

8.8.3.1.1 Water Supply Construction Stage Measures to be Implemented:

- Contact the local authority to adhere to the measures required for introducing a new watermain connection.
- Testing of the system meter & telemetry system is required.

8.8.3.2 Operational Phase

8.8.3.2.1 Water Supply Operational Stage Measures to be Implemented:

- The site water main system will be metered as directed by the Council to facilitate detection of leakage and the prevention of water loss.
- Dual & low flush toilets and water economy outlets will all be considered to reduce the water demand.

8.9 Predicted Impacts of the Proposed Development

8.9.1 Surface Water

8.9.1.1 Construction Phase

Provided that the proposed remedial or reductive measures are implemented, the impact of the proposed development during the construction stage will be of a temporary nature and will be minimised.
The predicted impact of the proposed development is an overall, long term permanent, positive impact to the local and regional area due to the removal of impacted made ground which is a source of contamination.

8.9.1.2 Operational Phase

There will be a decrease in surface water run-off from the new development due to the SUDS measures proposed. Surface water run-off will also improve in quality due to these measures.

8.9.1.3 'Worst-case' scenario

The worst-case scenario is that flooding occurs on-site and in the surrounding area due to this development. The design of the new drainage system which is detailed in the AWN report (TH/19/11083SR01) ensures that the pipe sizes, gradients etc. will be adequate for the design stormwater flows.

8.9.2 Foul Water Drainage

8.9.2.1 Construction Phase

Provided that the proposed remedial or reductive measures are implemented, the impact of the proposed development during the construction stage will be of a temporary nature and will be minimised. There will be a temporary increase in traffic due to the delivery of materials and other construction related traffic.

The contractor's operations will result in the generation of effluent and sanitary waste from facilities provided for the workforce on site.

8.9.2.2 Operational Phase

The increase in water consumption and resulting foul water flow is a function of the usage of the development.

8.9.2.3 'Worst-case' scenario

A *'worst-case'* scenario resulting from the construction of the development would result in the contamination of groundwater and the local streams by foul effluent from the development. However, the mitigation measures outlined detailed in the AWN report (TH/19/11083SR01) will ensure that this should not occur as the separate sewers will have the adequate capacity for the facility as required by Irish Water licencing.

8.9.3 Water Supply

8.9.3.1 Construction Phase

Provided that the proposed remedial or reductive measures are implemented, there will be no appreciable impact of the proposed development during the construction stage on the water supply in the area.

8.9.3.2 Operational Phase

The increase in water consumption is a function of the usage of the development.
The installation of water saving devices will further reduce the impact of the re-development on the existing water supply network.

8.9.3.3 'Worst-case' scenario

The '*worst case'* scenario would be the pollution of the water supply by an accidental spillage or contamination during the connection process. However, the mitigation measures proposed should ensure that this will not occur. Prior to connection to the public watermain, all watermains in the development will be tested and cleaned to the requirements of Irish Water.

8.9.4 Monitoring

All surface water drainage works will be approved by Dublin City County Council, Drainage Division, and will be carried out in accordance with the GDRCOP (Greater Dublin Regional Code of Practice for Drainage Works). Foul and water works will be carried out in accordance with Irish Water Codes of Practice.

8.9.5 Hydrogeology

Although no specific monitoring will be required as part of the proposed development it is envisaged that EPA Monitoring will continue in the area through the life of the development.

8.9.6 Surface Water

8.9.6.1 Construction Phase

Monitoring during the Construction Phase of the development should consist of the following:

- Normal quality control inspection of the works.
- Monitoring of possible discharges to the existing culverted watercourse at its outfall may also be required by DCC to ensure that no unauthorised discharges are occurring.

- Pressure testing and CCTV inspections of the surface water drains following completion of stages of the construction is recommended to ensure that the required construction standards are being maintained.
- Upon completion of the development, monitoring of the discharges from the development will be undertaken as required.

8.9.6.2 Operational Phase

Monitoring during the operational phase of the development is recommended as follows:

- All filters, silt traps, hydro-brakes and overflows should be inspected regularly and, in particular, after heavy rainfall events to ensure that they are not blocked.
- Gullies in the public road should be inspected and cleaned as required
- Pollutants which accumulate within the oil petrol interceptor on site should be regularly monitored and removed as necessary.

8.9.7 Foul Water Drainage

8.9.7.1 Construction Phase

Monitoring during the Construction Phase of the development should consist of the following:

- Normal quality control inspection of the works;
- Groundwater pumped from the shallow aquifer during dewatering operations at the Site will be monitored in accordance with the Discharge Consent License issued by Irish Water.
- Monitoring of possible discharges to the existing culverted watercourse is also required by DCC to ensure that no unauthorised discharges are occurring;
- Pressure testing and CCTV inspections of the foul sewers following completion of stages of the construction is recommended to ensure that the required construction standards are being maintained;
- Upon completion of the development, monitoring of the discharges from the development will be undertaken as required.

8.9.7.2 Operational Phase

No monitoring of foul effluent from the development is considered to be necessary.

8.9.8 Water Supply

Metering will allow the water supply to the development to be monitored, this is to be done to the requirements of Irish Water.

8.10 Reinstatement

8.10.1 Hydrogeology

No specific reinstatement measures are required.

8.10.2 Surface Water

8.10.2.1 Construction Phase

Reinstatement at completion of the works will involve:

- The cleaning of the existing sewers in the vicinity of the development as required.
- All excavations will be fully reinstated to the requirements of DCC.
- Leaving the area in a neat and clean condition, removing all deleterious materials that may have been deposited during construction works.

8.10.2.2 Operational Phase

Following completion of the development no reinstatement works are envisaged.

8.10.3 Foul Water Drainage

8.10.3.1 Construction Phase

Reinstatement at completion of the works will involve:

- The cleaning and sterilisation of the existing sewers in the vicinity of the development as required;
- All excavations will be fully reinstated to the requirements of DCC.
- Leaving the area in a neat and clean condition, removing all deleterious materials that may have been deposited during the construction works.

8.10.3.2 Operational Phase

No reinstatement works are envisaged upon completion of the development.

8.10.4 Water Supply

All excavations will be fully reinstated to the requirements of Irish Water.

8.11 Interactions

8.11.1 Surface Water

The design team has been in regular contact with each other throughout the design process to minimise environmental impacts and to ensure a sustainable and integrated approach to the design of the proposed development.

8.11.2 Foul Water Drainage

The design team has been in regular contact with each other throughout the design process to minimise environmental impacts and to ensure a sustainable and integrated approach to the design of the proposed development.

8.11.3 Water Supply

The design team has been in regular contact with each other throughout the design process to minimise environmental impacts and to ensure a sustainable and integrated approach to the design of the proposed development.

8.12 Difficulties Encountered in Compiling

8.12.1 Surface Water

None.

8.12.2 Foul Water Drainage

None.

8.12.3 Water Supply

None.

8.13 References

- RSK Ireland Limited, Generic Quantitative Risk Assessment (GQRA), report reference 602010 R04 (May 2018)
- CS Consulting Ltd, Engineering Services Report, Spencer Place Residential Block 2, report reference R043 (March 2019)
  AWN Consulting, Hydrological & Hydrogeological Qualitative Risk Assessment for Proposed Development at Spencer Place Block 2, Spencer Dock D1, report reference TH/19/11083SR01 (August 2018)
- Guidelines on the information to be contained in Environmental Impact Statements (EPA 2002) and Advice Notes on Current Practice in the preparations of Environmental Impact Statements (EPA 2003)
- BS EN 752:2008 “Drain and Sewer Systems outside Buildings”
- Part H of the Building Regulations
- Greater Dublin Strategic Drainage Study
- Ciria C697 “The SUDS Manual”
- Sewers for adoption: 6th Edition
- Guidelines on the information to be contained in Environmental Impact Statements (EPA 2002) and Advice Notes on Current Practice in the preparations of Environmental Impact Statements (EPA 2003)
- BS EN 752:2008 “Drain and Sewer Systems outside Buildings”
- Part H of the Building Regulations
- Greater Dublin Strategic Drainage Study
- Ciria C697 “The SUDS Manual”
- Sewers for adoption: 6th Edition
- Guidelines on the information to be contained in Environmental Impact Statements (EPA 2002) and Advice Notes on Current Practice in the preparations of Environmental Impact Statements (EPA 2003).
- Dun Laoghaire Rathdown County Council Water Main Map.

Chapter 9:

AIR QUALITY AND CLIMATE

9.0 AIR QUALITY AND CLIMATE

9.1 INTRODUCTION

AWN Consulting Ltd. has been commissioned to carry out an assessment of the potential air quality and climate impacts as a result of the proposed mixed-use development (residential and aparthotel facilities) at the Spencer North, Dublin 1. An odour assessment has also been prepared as a standalone document for the Irish Water emission point located on the site which is to be adjusted as part of the development.

9.1.1 Background Information

Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "*Air Quality Standards*" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Table 9.1 and Appendix 9.1).

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporate EU Directive 2008/50/EC, which has set limit values for NO_2, PM_{10}, $PM_{2.5}$, benzene and CO (see Table 9.1). Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions (see Appendix 9.1).

Dust Deposition Guidelines

The concern from a health perspective is focussed on particles of dust which are less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$) and the EU ambient air quality standards outlined in Table 9.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. Furthermore, no specific criteria have been stipulated for nuisance dust in respect of this development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust)[(1)] sets a maximum permissible immission level for dust deposition of 350 mg/(m^2*day) averaged over a one year period at any receptors outside the site boundary. Recommendations from the Department of the Environment, Health & Local Government[(2)] apply the Bergerhoff limit of 350 mg/(m^2*day) to the site boundary of quarries. This limit value can also be implemented with regard to dust impacts from construction of the proposed development.

Climate Agreements

Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) in April 1994 and the Kyoto Protocol in principle in 1997 and formally in May 2002 [2,3]. For the purposes of the EU burden sharing agreement under Article 4 of the Kyoto Protocol, in June 1998, Ireland agreed to limit the net growth of the six GHGs under the Kyoto Protocol to 13% above the 1990 level over the period 2008 to 2012[4,5]. An updated EU burden sharing agreement was formed under Article 4 of the Doha Amendment to the Kyoto Protocol, in December 2012, Ireland agreed to limit the net growth of the six Greenhouse Gases (GHGs) under the Kyoto Protocol to 20% below the 2005 level over the period 2013 to 2020 (UNFCCC 2012).

The UNFCCC is continuing detailed negotiations in relation to GHGs reductions and in relation to technical issues such as Emission Trading and burden sharing. The most recent Conference of the Parties to the Convention (COP24) took place in Katowice, Poland from the 4th to the 14th December 2018 and focussed on advancing the implementation of the Paris Agreement. The Paris Agreement was established at COP21 in Paris in 2015 and is an important milestone in terms of international climate change agreements. The "Paris Agreement", agreed by over 200 nations, has a stated aim of limiting global temperature increases to no more than 2°C above pre-industrial levels with efforts to limit this rise to 1.5°C. The aim is to limit global GHG emissions to 40 gigatonnes as soon as possible whilst acknowledging that peaking of GHG emissions will take longer for developing countries. Contributions to greenhouse gas emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant progress was also made on elevating adaption onto the same level as action to cut and curb emissions.

The EU, on the 23rd/24th of October 2014, agreed the "2030 Climate and Energy Policy Framework"[7]. The European Council endorsed a binding EU target of at least a 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990. The target will be delivered collectively by the EU in the most cost-effective manner possible, with the reductions in the ETS and non-ETS sectors amounting to 43% and 30% by 2030 compared to 2005, respectively. Secondly, it was agreed that all Member States will participate in this effort, balancing considerations of fairness and solidarity. The policy also outlines, under "Renewables and Energy Efficiency", an EU binding target of at least 27% for the share of renewable energy consumed in the EU in 2030.

Gothenburg Protocol

In 1999, Ireland signed the Gothenburg Protocol to the 1979 UN Convention on Long Range Transboundary Air Pollution. The initial objective of the Protocol was to control and reduce emissions of Sulphur Dioxide (SO_2), Nitrogen Oxides (NO_X), Volatile Organic Compounds (VOCs) and Ammonia (NH_3). To achieve the initial targets Ireland was obliged, by 2010, to meet national emission ceilings of 42 kt for SO_2 (67% below 2001 levels), 65 kt for NO_X (52% reduction), 55 kt for VOCs (37% reduction) and 116 kt for NH_3 (6% reduction). In 2012, the Gothenburg Protocol was revised to include national emission reduction commitments for the main air pollutants to be achieved in 2020 and beyond and to include emission reduction commitments for $PM_{2.5}$. In relation to Ireland, 2020 emission targets are 25 kt for SO_2 (65% on 2005 levels), 65 kt for NO_X (49% reduction on 2005 levels), 43 kt for VOCs (25% reduction on 2005 levels), 108 kt for NH_3 (1% reduction on 2005 levels) and 10 kt for $PM_{2.5}$ (18% reduction on 2005 levels).

European Commission Directive 2001/81/EC, the National Emissions Ceiling Directive (NECD), prescribes the same emission limits as the 1999 Gothenburg Protocol. A National Programme for the progressive reduction of emissions of these four transboundary pollutants has been in place since April 2005[7,8]. Data available from the EU in 2010 indicated that Ireland complied with the emissions ceilings for SO_2, VOCs and

NH_3 but failed to comply with the ceiling for NO_X[9]. Directive (EU) 2016/2284 "*On the Reduction of National Emissions of Certain Atmospheric Pollutants and Amending Directive 2003/35/EC and Repealing Directive 2001/81/EC*" was published in December 2016. The Directive will apply the 2010 NECD limits until 2020 and establish new national emission reduction commitments which will be applicable from 2020 and 2030 for SO_2, NO_X, NMVOC, NH_3, $PM_{2.5}$ and CH_4. In relation to Ireland, 2020-29 emission targets are for SO_2 (65% below 2005 levels), for NO_X (49% reduction), for VOCs (25% reduction), for NH_3 (1% reduction) and for $PM_{2.5}$ (18% reduction). In relation to 2030, Ireland's emission targets are for SO_2 (85% below 2005 levels), for NO_X (69% reduction), for VOCs (32% reduction), for NH_3 (5% reduction) and for $PM_{2.5}$ (41% reduction).

Table 9.1 Air Quality Standards Regulations 2011 (based on EU Council Directive 2008/50/EC)

Pollutant	Regulation Note 1	Limit Type	Value
Nitrogen Dioxide (NO_2)	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m^3
		Annual limit for protection of human health	40 µg/m^3
		Critical level for protection of vegetation	30 µg/m^3 NO + NO_2
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m^3
		Annual limit for protection of human health	40 µg/m^3
Particulate Matter (as $PM_{2.5}$)	2008/50/EC	Annual limit for protection of human health	25 µg/m^3
Benzene	2008/50/EC	Annual limit for protection of human health	5 µg/m^3
Carbon Monoxide (CO)	2008/50/EC	8-hour limit (on a rolling basis) for protection of human health	10 mg/m^3 (8.6 ppm)

Note 1 EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

9.2 STUDY METHODOLOGY

Construction Stage

The Institute of Air Quality Management in the UK (IAQM) guidelines[10] outline an assessment method for predicting the impact of dust emissions from demolition, earthworks, construction and haulage activities based on the scale & nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development in order to predict the likely magnitude of the dust impacts in the absence of mitigation measures.

Operational Stage

The air quality assessment is carried out following procedures described in the publications by the EPA[11,12] and using the methodology outlined in the guidance documents published by the UK DEFRA[13 - 17]. The assessment of air quality is carried out using a phased approach as recommended by the UK DEFRA[14]. The phased approach recommends that the complexity of an air quality assessment be consistent with the

risk of failing to achieve the air quality standards. In the current assessment, an initial scoping of possible key pollutants was carried out and the likely location of air pollution "*hot-spots*" identified. An examination of recent EPA and Local Authority data in Ireland[18,19] has indicated that SO_2, smoke and CO are unlikely to be exceeded at locations such as the current one and thus these pollutants do not require detailed monitoring or assessment to be carried out. However, the analysis did indicate potential issues in regards to nitrogen dioxide (NO_2), PM_{10} and $PM_{2.5}$ at busy junctions in urban centres[18,19]. Benzene, although previously reported at quite high levels in urban centres, has recently been measured at several city centre locations to be well below the EU limit value[20-21]. Historically, CO levels in urban areas were a cause for concern. However, CO concentrations have decreased significantly over the past number of years and are now measured to be well below the limits even in urban centres[18,19]. The key pollutants reviewed in the assessments are NO_2, PM_{10}, $PM_{2.5}$, benzene and CO, with particular focus on NO_2 and PM_{10}.

The assessment methodology involves air dispersion modelling using the UK DMRB Screening Model[16] (Version 1.03c, July 2007), the NO_x to NO_2 Conversion Spreadsheet[20] (Version 6.1, October 2017), and following guidance issued by the TII[21], UK Highways Agency[16], UK DEFRA[13-17] and the EPA[11,12].

The TII guidance[21] states that the assessment must progress to detailed modelling if:

- Concentrations exceed 90% of the air quality limit values when assessed by the screening method; or
- Sensitive receptors exist within 50m of a complex road layout (e.g. grade separated junctions, hills etc).

The UK DMRB guidance[15], on which the TII guidance was based, states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment:

- Road alignment change of 5 metres or more;
- Daily traffic flow changes by 1,000 AADT or more;
- HGV flows change by 200 vehicles per day or more;
- Daily average speed changes by 10 km/h or more; or
- Peak hour speed changes by 20 km/h or more.

Odour

Emissions from the proposed relocated flue of the Irish Water pumping station have be modelled using the AERMOD dispersion model (Version 18081) which has been developed by the U.S. Environmental Protection Agency (USEPA) and following guidance issued by the EPA.

9.3 EXISTING RECEIVING ENVIRONMENT

Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels)[22]. Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources

will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Dublin Airport, which is located approximately 13 km north of the site. Dublin Airport met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 9.1). For data collated during five representative years (2014 - 2018), the predominant wind direction is south-westerly. The average wind speed over the period 1981 – 2010 is approximately 5.3 m/s.

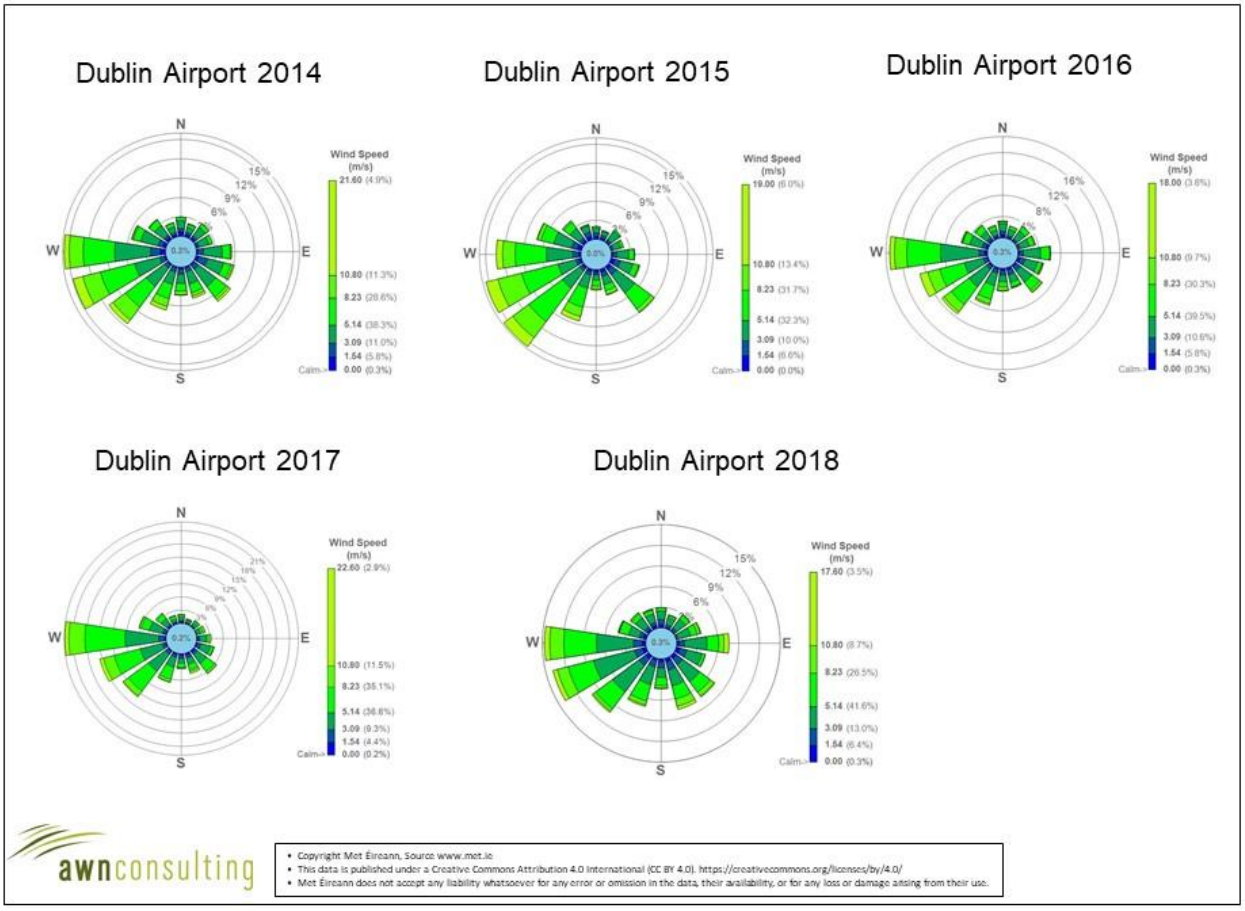

Figure 9.1 Dublin Airport Windrose 2014 - 2018

Baseline Air Quality – Review of Available Background Data

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality in Ireland is the "*Air Quality In Ireland 2016 – Indicators of Air Quality*"[19]. The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments[18].

In terms of air monitoring and assessment, Spencer Place is within the Zone A Dublin region[19]. The long-term monitoring data has been used to determine background concentrations for the key pollutants in the

region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.).

Long-term NO_2 monitoring was carried out at the Zone A roadside location of Winetavern Street and the urban background locations of Rathmines, Dún Laoighaire, Swords and Ballyfermot for the period 2013 - 2017[18,19]. The NO_2 annual average for this five-year period suggests an upper average limit of no more than 20 µg/m^3 (Table 9.2) for the urban background locations. The station at Winetavern Street is approximately 2.5km from the proposed development site and would experience higher background concentrations of NO_2 to the proposed development. Long term average concentrations are significantly below the annual average limit of 40 µg/m^3. Based on the above information and keeping regard for the further distance from the city centre, a conservative estimate of the current background NO_2 concentration for the region of the proposed development is 25 µg/m^3.

Table 9.2 Trends In Trends In Dublin City Air Quality – NO_2[18,19]

Year	Winetavern Street	Rathmines	Dún Laoghaire	Swords	Ballyfermot
2013	31	19	16	15	16
2014	31	17	15	14	16
2015	31	18	16	13	16
2016	37	20	19	16	17
2017	27	27	17	14	17
Average	**31.3**	**20.2**	**16.5**	**14.3**	**16.4**

Note 1 Annual average limit value - 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Continuous PM_{10} monitoring was carried out at five Zone A locations from 2013 - 2017, Winetavern Street, Rathmines, Dún Laoghaire, Tallaght and Phoenix Park. These showed an upper average limit of no more than 15 µg/m^3 (Table 9.3). Levels range from 9 - 17 µg/m^3 over the five-year period with at most 5 exceedances (in Rathmines) of the 24-hour limit value of 50 µg/m^3 in 2017 (35 exceedances are permitted per year)[19]. Based on the EPA data, a conservative estimate of the current background PM_{10} concentration in the region of the proposed development is 15 µg/m^3.

Table 9.3 Trends In Trends In Dublin City Air Quality - PM_{10}[18,19]

Year	Winetavern Street	Rathmines	Dún Laoghaire	Tallaght	Phoenix Park
2013	14	17	17	17	14
2014	14	14	14	15	12
2015	14	15	13	14	12
2016	14	15	13	14	11
2017	13	13	12	12	9
Average	**13.8**	**14.8**	**13.8**	**14.4**	**11.5**

Note 1 Annual average limit value - 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Average $PM_{2.5}$ levels in Rathmines over the period 2013 - 2017 ranged from 9 - 11 µg/m^3, with a $PM_{2.5}/PM_{10}$ ratio ranging from 0.64 – 0.68[19]. Based on this information, a conservative ratio of 0.7 was used to generate an existing $PM_{2.5}$ concentration in the region of the facility of 10.5 µg/m^3.

In terms of benzene, the annual mean concentration in the Zone A monitoring location of Rathmines for 2017 was 0.92 µg/m^3. This is well below the limit value of 5 µg/m^3. Between 2013 - 2017 annual mean concentrations at the Zone A site ranged from 0.92 – 1.01 µg/m^3. Based on this EPA data a conservative estimate of the current background benzene concentration in the region of the proposed development is 1.0 µg/m^3.

With regard to CO, annual averages at the Zone A, locations of Winetavern Street and Coleraine Street over

the 2013 – 2017 period are low, peaking at 5% of the limit value (10 mg/m^3)[19]. Based on this EPA data, a conservative estimate of the current background CO concentration in the region of the proposed development is 0.5 mg/m^3.

Sensitivity of the Receiving Environment

In line with the IAQM guidance document[10] prior to assessing the impact of dust from a proposed development the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity.

In terms of receptor sensitivity to dust soiling, there are a number of apartment complexes (high sensitivity receptors) located within 20 m of the proposed development site and therefore there is the potential for more than 100 highly sensitive receptors within 20m. Based on the IAQM criteria outlined in Table 9.4, the worst-case sensitivity of the area to dust soiling is considered to be **high**.

Table 9.4 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	**<50**	**<100**	**<350**
High	>100	**High**	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM_{10} concentration, receptor sensitivity based on type and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the proposed development is estimated to be 15 µg/m^3 and due to apartments nearby there is the potential for >100 high sensitivity receptors located within 20 m of the proposed works. Based on the IAQM criteria outlined in Table 9.5, the worst-case sensitivity of the area to human health is considered to be **medium**

Table 9.5 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number Of Receptors	Distance from source (m)			
			<20	**<50**	**<100**	**<200**
High	< 24 µg/m^3	>100	**Medium**	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	< 24 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	< 24 µg/m^3	>1	Low	Low	Low	Low

9.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Planning permission is being sought for a proposed mixed-use development (residential and shared accommodation facilities) at the Spencer North, Dublin 1.

The application site is currently under construction for planning application reference Reg. Ref. 2896/18 as amended by Reg. Ref. DSDZ4279/18 for 349 no. residential units and an aparthotel scheme (102 no. units) over basement level. The proposed development seeks alterations to this development currently under construction to provide for 464 no. residential apartment units and 200 no. shared accommodation bed spaces.

9.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

Construction phase

Air Quality

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 200m of a construction site, the majority of the deposition occurs within the first 50m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction.

It is important to note that the potential impacts associated with the construction phase of the proposed development are short-term in nature. When the dust minimisation measures detailed in Appendix 9.2 of this section are implemented, fugitive emissions of dust from the site will not be significant and will pose no nuisance at nearby receptors.

In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see Section 9.3). The major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (movement of heavy vehicles).

Demolition

Demolition will primarily involve removal of a small number of existing outbuildings in order to facilitate construction. Dust emission magnitude from demolition can be classified as small, medium or large and are described below.

- **Large:** Total building volume >50,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level.
- **Medium:** Total building volume 20,000 m^3 – 50,000 m^3, potentially dusty construction material, demolition activities 10-20 m above ground level.
- **Small:** Total building volume 20,000 m^3, construction material with low potential for dust release, demolition activities <10 m above ground, demolition occurring during wetter months.

The dust emission magnitude for the proposed demolition activities can be classified as small. This results in an overall **low** risk of **temporary** dust soiling impacts (as it is high sensitivity area in terms of dust soiling) and an overall **low** risk of **temporary** human health impacts (as it is a low sensitivity area in terms of human health) as a result of the proposed demolition activities as outlined in Table 9.6.

Table 9.6: Risk of Dust Impacts – Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Earthworks

Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling the site and landscaping. Dust emission magnitude from earthworks can be classified as small, medium and large and are described below.

- **Large:** Total site area > 10,000 m^2, potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds > 8 m in height, total material moved >100,000 tonnes;

- **Medium:** Total site area 2,500 m^2 – 10,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8 m in height, total material moved 20,000 – 100,000 tonnes; and

- **Small:** Total site area < 2,500 m^2, soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4 m in height, total material moved < 20,000 tonnes, earthworks during wetter months.

The dust emission magnitude for the proposed earthwork activities can be classified as large as the site is greater than 10,000 m^2. This results in an overall **high** risk of **temporary** dust soiling impacts and an overall **medium** risk of **temporary** human health impacts as a result of the proposed earthworks activities as outlined in Table 9.7.

Table 9.7: Risk of Dust Impacts - Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

Large: Total building volume > 100,000 m^3, on-site concrete batching, sandblasting;

Medium: Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on-site concrete batching;

Small: Total building volume < 25,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

The dust emission magnitude for the proposed construction activities can be classified as medium as a worst-case as the total volume of the new buildings will be between 25,000 m^3 – 100,000 m^3, but there is unlikely to be any on-site concrete batching. The sensitivity of the area is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. As outlined in Table 9.8, this results in an overall **medium risk** of temporary dust soiling impacts and an overall **low risk** to human health impacts as a result of the proposed construction activities.

Table 9.8 Risk of Dust Impacts – Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Trackout

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

Large: > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m;

Medium: 10 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100 m;

Small: < 10 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

The dust emission magnitude for the proposed trackout can be classified as medium as worst-case as there are likely to be up to 30 outward HGV movements per day.

The sensitivity of the area is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. As outlined in Table 9.9, this results in an overall **medium risk** of temporary dust soiling impacts and a **low risk** of temporary human health impacts as a result of the proposed track-out activities.

Table 9.9 Risk of Dust Impacts – Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Summary of Dust Emission Risk

The risk of dust impacts as a result of the proposed development are summarised in Table 9.8 for each activity. The magnitude of risk determined is used to prescribe the level of site specific mitigation required for each activity in order to prevent significant impacts occurring.

Overall, in order to ensure that no dust nuisance occurs during the construction and trackout activities, a range of dust mitigation measures associated with a **high risk** of dust impacts must be implemented. When the dust mitigation measures detailed in Appendix 9.2 are implemented, fugitive emissions of dust from the site will be insignificant and pose no nuisance at nearby receptors.

Table 9.10 Summary of Dust Impact Risk used to Define Site-Specific Mitigation

Potential Impact	Dust Emission Magnitude			
	Demolition	**Earthworks**	**Construction**	**Trackout**
Dust Soiling	Low Risk	High Risk	Medium Risk	Medium Risk
Human Health	Low Risk	Medium Risk	Low Risk	Medium Risk

Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO_2 and N_2O emissions.

Human Health

Construction related dust emissions have the potential to impact human health. As determined above, the likely risk of human health impacts as a result of all relevant construction activities is considered low.

Operational Phase

Air Quality

There is the potential for a number of emissions to the atmosphere during the operational phase of the development. In particular, the traffic-related air emissions may generate quantities of air pollutants such as NO_2, CO, benzene, PM_{10} and $PM_{2.5}$.

Traffic flow information was obtained from the consulting engineers on this project (CS Consulting) and has been used to model pollutant levels under various traffic scenarios and under sufficient spatial resolution to assess whether any significant air quality impact on sensitive receptors may occur.

Cumulative effects have been assessed, as recommended in the EU Directive on EIA (Council Directive 97/11/EC) and using the methodology of the UK DEFRA[13,14]. Firstly, background concentrations have been included in the modelling study. These background concentrations are year-specific and account for non-localised sources of the pollutants of concern. Appropriate background levels were selected based on the available monitoring data provided by the EPA.

There is the potential for a number of emissions to the atmosphere during the operational phase of the development. In particular, the traffic-related air emissions may generate quantities of air pollutants such as NO_2, CO, benzene and PM_{10}/$PM_{2.5}$. However, impacts from these emissions have been screened out using the UK DMRB guidance[16], on which the TII guidance[21] was based. This guidance states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment:

- Road alignment change of 5 metres or more;
- Daily traffic flow changes by 1,000 AADT or more;
- HGV flows change by 200 vehicles per day or more;
- Daily average speed changes by 10 km/h or more; or
- Peak hour speed changes by 20 km/h or more.

The proposed development will increase traffic levels by less than 1,000 AADT or 200 HGVS in both the opening or design years. It will also not change speeds or change the road alignment by an amount greater than the criteria discussed above. Therefore, none of the road links impacted by the proposed development satisfy the above criteria and an assessment of the impact of traffic emissions during the operational phase on ambient air quality is not necessary as impacts of the development in terms of PM_{10}, $PM_{2.5}$, CO, NO_2 and benzene are long-term, localised, negative and imperceptible.

Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the operational phase of the development. Road traffic and space heating of buildings may give rise to CO_2 and N_2O emissions.

Odour

An assessment of the contribution of odour emissions from the Irish Water pumping station flue to odour concentrations at sensitive receptors in the Proposed Spencer Place North Development will also be evaluated. The assessment concludes that concentrations of odour due to the Irish Water pumping station flue will be significantly below the detectible concentration at the worst-case sensitive receptor.

Human Health

Traffic related air emissions have the potential to impact human health if they do not comply with the ambient Air Quality Standards detailed in Table 9.1.

9.6 POTENTIAL CUMULATIVE IMPACTS

Should the Construction Phase of the proposed development and any significant developments coincide, it is predicted that once appropriate mitigation measures are put in place during the construction for the proposed development, impacts will not be significant. Cumulative impacts on air quality due to unmitigated dust have the greatest potential for significant impacts however with mitigation measures in place the potential for cumulative impacts is insignificant.

The cumulative impact of the proposed development is also predicted to cause imperceptible impacts during the operational phase with respect to local air quality for the long and short term as there is no predicted impact on air quality during the Operational Phase of the proposed development.

The results of this assessment were that, with appropriate mitigation measures, the cumulative impact is predicted to be neutral, imperceptible, reversible and long-term during the Construction and Operational Phases.

9.7 DO NOTHING IMPACT

The Do-Nothing scenario includes retention of the current site and development of the Rejuvenation Scheme without the proposed development in place. The air quality assessment of the Rejuvenation Scheme without the proposed residential extension found that the impact to air quality would be negligible. Therefore, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

9.8 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

Construction Phase

Air Quality

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust.

AQ CONST 1: Air Quality Mitigation Measure
The dust minimisation measures specified in Appendix 9.2 of this chapter will be implemented during the construction phase of the project and thus fugitive emissions of dust from the site will be insignificant and pose no nuisance at nearby receptors.

Climate

CO_2 and N_2O emissions during construction will have a negligible impact on climate therefore no mitigation measures are required.

Operational Phase

The impact of the proposed development on air quality and climate will be imperceptible. Thus, no site-specific mitigation measures are required.

9.9 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

Construction Phase

Air Quality

If the dust minimisation measures specified in Appendix 9.2 of this chapter are implemented, fugitive emissions of dust from the site will be ***short-term*** and ***insignificant*** and pose no nuisance at nearby receptors. Construction vehicles, generators etc., will also give rise to some exhaust emissions. However, due to the size and nature of the construction activities, exhaust emissions during construction will have a negligible impact on local air quality. It should be noted that the majority of site works will be undertaken or are currently being undertaken as part of the permitted Rejuvenation Scheme and similar mitigation measures to those proposed in Appendix 9.2 should currently be in place on site to avoid dust nuisance impacts. The proposed residential extension is unlikely to add significantly to on-site dust emissions.

Climate

Due to the small scale of the development the impact on the climate as a result of greenhouse gas emissions is considered to be ***imperceptible*** in the ***long and short term***.

Human Health

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions

at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be ***short-term*** and ***imperceptible*** with respect to human health.

Operational Phase

The primary impacts to air quality or climate would involve the change in traffic flows or congestion in the local areas which are associated with the development. However, none of the road links impacted by the development satisfy the criteria to complete an air modelling assessment, it can therefore be determined that the impact to air quality and climate from traffic emissions during the operational stage are ***imperceptible*** and ***not significant*** for the long and short term.

In addition, there are no predicted impacts to human health during the operational stage of the development.

9.10 MONITORING

In order to ensure that any dust nuisance is minimised, a series of mitigation measures have been listed in Appendix 9.2. If the construction contractor adheres to good working practices and implements dust mitigation measures the levels of dust generated are assessed to be minimal and are unlikely to cause an environmental nuisance.

9.11 REINSTATEMENT

Not Applicable

9.12 INTERACTIONS

Air Quality does not have a significant number of interactions with other parameters. The most important interaction is between air quality and human beings. Interactions between air quality and traffic also have the potential to be significant.

Construction stage dust emissions have the potential to impact human health, however, it was determined that the risk to human health is low for all relevant construction activities. Best practice dust mitigation measures will be implemented on site and as such impacts to human health are predicted to be imperceptible and short-term.

Traffic related emissions have the potential to impact air quality, however, none of the road links impacted by the proposed development satisfied the assessment criteria and it was therefore determined that the impact to air quality is imperceptible for the long and short term.

9.13 DIFFICULTIES ENCOUNTERED IN COMPILING

No difficulties were encountered in the course of this assessment.

9.14 REFERENCES

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(2) DOEHLG (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities
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(9) EEA (2012) NEC Directive Status Reports 2011
(10) IAQM (2014) Guidance on the Assessment of Dust from Demolition and Construction
(11) EPA (2017) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports - Draft
(12) EPA (2015) Advice Notes for Preparing Environmental Impact Statements – Draft
(13) UK DEFRA (2018) Part IV of the Environment Act 1995: Local Air Quality Management, LAQM.TG(16)
(14) UK DEFRA (2016) Part IV of the Environment Act 1995: Local Air Quality Management, LAQM. PG(16)
(15) UK DETR (1998) Preparation of Environmental Statements for Planning Projects That Require Environmental Assessment - A Good Practice Guide, Appendix 8 - Air & Climate
(16) UK Highways Agency (2007) Design Manual for Roads and Bridges Vol 11 Chapter 3, HA 207/07 (Document & Calculation Spreadsheet)
(17) UK DEFRA (2001) DMRB Model Validation for the Purposes of Review and Assessment
(18) Environmental Protection Agency (2019) Air Monitoring Data (http://www.epa.ie/whatwedo/monitoring/air/)
(19) Environmental Protection Agency (2018) Air Quality in Ireland 2017 - -Indicators of Air Quality (& previous annual reports 2010 - 2016)
(20) UK DEFRA (2017) NO_x to NO_2 Conversion Spreadsheet (Version 6.1)
(21) Transport Infrastructure Ireland (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes
(22) World Health Organisation (2006) Air Quality Guidelines - Global Update 2005 (and previous Air Quality Guideline Reports 1999 & 2000)
(23) The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings
(24) UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance
(25) BRE (2003) Controlling Particles, Vapours & Noise Pollution From Construction Sites
(26) USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures
(27) USEPA (1986) Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition (periodically updated)

Chapter 10:

NOISE AND VIBRATION

10.0 NOISE AND VIBRATION

10.1 INTRODUCTION

AWN Consulting Ltd. has been commissioned to carry out an assessment of the potential noise and vibration impacts as a result of the proposed mixed-use development (residential and aparthotel facilities) at Spencer North, Dublin 1.

This section of the EIAR has been prepared by AWN in the context of current relevant standards and guidance. This assessment has been prepared by Dr Stephen Smyth BA BAI MIEI MIOA, Associate at AWN Consulting who has over 12 years' experience as an environmental consultant specialising in Acoustics, Impact Assessment and Management.

This chapter includes a description of the receiving ambient noise climate in the vicinity of the subject site and an assessment of the potential noise and vibration impacts associated with the proposed development during both the short-term construction phase and the long-term operational phase on its surrounding environment and on the development itself. The assessment of direct, indirect and cumulative noise and vibration impacts on the surrounding environment have been considered as part of the assessment.

Mitigation measures are included, where relevant, to ensure the proposed development is constructed and operated in an environmentally sustainable manner in order to ensure minimal impact on the receiving environment.

The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out within the relevant sections of this chapter and included in the references section. In addition to specific noise guidance documents, the following guidelines were considered and consulted for the purposes of this chapter:

- EPA Guidelines on the Information to be contained in Environmental Impact Statements, (EPA, 2002);
- EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), (EPA, 2003);
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (Draft August 2017), and;
- EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, September 2015).

10.2 STUDY METHODOLOGY

The following methodology has been undertaken for this study:

- A baseline survey of the existing noise environment has been reviewed and discussed in order to characterise the prevailing noise environment.
- A review of the most applicable standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development;
- The noise and vibration impacts relating to the construction phase have been assessed making reference to source data contained within BS 5228 (2009 +A1 2014) *Code of Practice for the Control on Noise and Vibration on Construction and Open Sites.* Part 1*: Noise* and Part 2: *Vibration.*

- Predictive calculations have been performed to assess the potential impacts associated with the operational of the development at the most sensitive locations surrounding the development site.
- A schedule of mitigation measures has been proposed to reduce, where necessary, the identified potential impacts relating to noise and vibration from the proposed development.

10.3 EXISTING RECEIVING ENVIRONMENT

A noise survey was conducted in order to characterise the noise environment in the vicinity of the site. Survey details are set out below.

10.3.1 Choice of Measurement Locations

Noise measurements were conducted at two locations in the vicinity of the proposed site. Figure 10.1 shows the approximate locations of the measurement positions. These are described overleaf.

Figure 10.1 Baseline Noise Monitoring Locations

North — Located along the northern boundary of the development site at Sherriff Street Upper. The dominate source of noise in this area was noted to be road traffic noise.

South — Located along the southern boundary of the site close to the Luas stop at Mayor Street Upper. Luas activity was noticeable in the measured noise data with road traffic noise noted to be having less of an influence at this location.

10.3.2 Survey Periods

The noise survey was conducted over the course of five days from 28 June to 2 July 2018.

10.3.3 Personnel and Instrumentation

AWN Consulting Limited performed the measurements during the survey periods. The noise measurements were performed using a Brüel & Kjær Type 2250 Precision Sound Level Analyser and Larson Davis 831 Sound Level Meter. Before and after the survey the measurement apparatus was check calibrated using a Brüel & Kjær Type 4231 Sound Level Calibrator.

10.3.4 Procedure

Measurements were conducted at a continuous basis at each location. Sample periods for the noise measurements were 15 minutes during both daytime and night-time periods.

10.3.5 Measurement Parameters

The survey results are presented in terms of the following three parameters:

L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period. It is typically used as a descriptor for ambient noise.

L_{A10} is the sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.

L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

The "A" suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to $2x10^{-5}$ Pa.

10.3.6 Survey Results and Discussion

North

The survey results for the north monitoring location are summarised in Table 10.1.

Table 10.1 Summary of Noise Measurements at NSL 1

Date	Period	Measured Noise Levels (dB re. 2x10-5 Pa)		
		$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$
28 June 2018	Day	65	68	55
	Night	61	62	50
29 June 2018	Day	65	68	55
	Night	60	63	50
30 June 2018	Day	64	67	52
	Night	59	61	50
1 July 2018	Day	65	67	53
	Night	61	62	51
2 July 2018	Day	66	69	55

During the monitoring periods, the dominant source of noise in this area was road traffic on Sherriff Street Upper. Other sources noted were construction activity to the south and pedestrian activity on the footpaths.

Daytime ambient noise levels were in the range of 64 to 56dB L_{Aeq}. Daytime background noise levels were in the range of 52 to 55dB L_{A90}. Night-time ambient noise levels were in the range 59 to 61dB L_{Aeq}. Night-time background noise levels were in the range 50 to 51dB L_{A90}.

South

The survey results for the south monitoring location are summarised in Table 10.2.

Table 10.2 Summary of Noise Measurements at NSL 2

Date	Period	Measured Noise Levels (dB re. 2x10-5 Pa)		
		$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$
28 June 2018	Day	61	61	53
	Night	55	52	46
29 June 2018	Day	61	61	53
	Night	53	52	46
30 June 2018	Day	59	59	49
	Night	53	52	45
1 July 2018	Day	59	58	49
	Night	53	52	45
2 July 2018	Day	61	62	54

During monitoring periods, the dominant source of noise in this area was construction noise from sites to the south, Luas movements and road traffic. Daytime ambient noise levels were in the range of 59 to 61dB L_{Aeq}. Daytime background noise levels were in the range of 49 to 54dB L_{A90}. Night-time ambient noise levels were in the range 53 to 55dB L_{Aeq}. Night-time background noise levels were in the range 45 to 46dB L_{A90}.

10.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Planning permission is being sought for a proposed mixed-use development at Spencer North, Dublin 1.

The proposed development seeks amendments to the previously permitted development permitted under Ref. Reg. DSDZ2896/18 and as amended by Reg. Ref. DSDZ4279/18. The proposed development comprises of the reconfiguration of the permitted residential scheme to provide for 464 no. residential units and 200 no. co living bed spaces at City Block 2, Spencer Dock, Dublin 1

In terms of the noise and vibration impacts of this proposal, this chapter has considered the impact from the short-term construction phase which will involve primarily the new structural element of the buildings above ground as the basement construction is being carried out under the existing permission.

During the operational phase, the key potential sources of noise and vibration will be long term and will include car parking, additional vehicles on surrounding roads, and mechanical and electrical plant.

The two phases are considered in this document.

10.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

10.5.1 Assessment Criteria

Noise

Construction Phase

The following construction noise limits are proposed for the development.

Table 10.4 Construction Noise Limits

Day	Period	Noise Levels, $L_{Aeq,1hr}$ (dB re. $2x10^{-5}$ Pa)
Monday to Friday	07:00 – 18:00hrs	70
	18:00hrs – 22:00hrs *	60
	22:00hrs – 07:00hrs *	55
Saturdays	08:00 – 14:00hrs	70
	14:00hrs – 22:00hrs *	60
	22:00hrs – 07:00hrs *	55
Sundays, Bank & Public Holidays	All Day *	55

Note * Construction activity at these times, other than that required for emergency works, will require the explicit permission of Dublin City Council.

Referring to Table 10.4, construction noise levels should be controlled to not exceed 70dB $L_{Aeq,1hr}$ at the nearest noise sensitive locations during the day surrounding the site taking into account the prevailing noise environment at the nearest noise sensitive locations.

Operational Phase

Outward Impact

To assess the impact of the development, it is proposed here to assess the significance of the impact at the nearest noise sensitive locations to the site. Assessing the significance of the impact involves the review of the existing baseline noise environment and the use of professional judgment.

The main potential source of outward noise impact associated with the proposed development relates to additional traffic flows on the surrounding road network. Given that traffic from the development will make use of existing roads already carrying traffic volumes, it is appropriate to consider the increase in traffic noise level that arises as a result of vehicular movements associated with the development.

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 10.5 offers guidance as to the likely impact associated with any particular change in traffic noise level (Source DMRB, 2011). It shows that small changes in noise levels are not normally noticeable, whereas an

increase of 10dB would be described as a doubling of loudness. In summary the assessment looks at the impact with and without development at the nearest noise sensitive locations.

Table 10.5 Significance in Change of Noise Level

Change in Sound Level (dB)	Subjective Reaction	Magnitude of Impact	EPA Glossary of Effects[1]
0	None	No Change	Neutral
0.1 – 2.9	Imperceptible	Negligible	Imperceptible
3 – 4.9	Perceptible	Minor	Slight
5 – 9.9	Up to a doubling of loudness	Moderate	Moderate
10+	Over a doubling of loudness	Major	Significant

For new mechanical plant items required to service the development and in the absence of Statutory Irish Guidelines, guidance on noise emissions from mechanical plant items from various City and County Council's in Ireland typically make reference to the *British Standard BS 4142:2014: Methods for rating and assessing industrial and commercial sound*. This document is the industry standard method for analysing building services plant sound emissions to residential receptors.

BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

For an appropriate BS 4142 assessment it is necessary to compare the measured external background sound level (i.e. the $L_{A90,T}$ level measured in the absence of plant items) to the rating level ($L_{Ar,T}$) of the plant items, when operational. Where sound emissions are found to be tonal, impulsive, intermittent or to have other sound characteristics that are readily distinctive against the residual acoustic environment, BS4142 advises that penalties be applied to the specific level to arrive at the rating level.

The following definitions as discussed in BS 4142 as summarised below:

"ambient sound level, $L_{Aeq,T}$" equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at any given time, usually from many sources near and far, at the assessment location over a given time interval, T.

"residual sound level, $L_{Aeq,T}$" equivalent continuous A-weighted sound pressure level of the residual sound (i.e. ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound) at the assessment location over a given time interval, T.

"specific sound level, $L_{Aeq,T}$" equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr.

"rating level, $L_{Ar,T}$" specific sound level plus any adjustment for the characteristic features of the sound.

[1] EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (Draft August 2017)

"background sound level, $L_{A90,T}$" A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.

In order to establish an initial estimate of impact, BS 4142 states the following:

"Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level from the rating level, and consider the following.

a. *Typically, the greater this difference, the greater the magnitude of the impact.*
b. *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
c. *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
d. *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact".

The assessment methodology described above (i.e. comparison of rated sound level to background sound level) is quoted in BS4142 as representing a methodology to 'obtain an initial estimate' of impact. The plant noise assessment conducted in the following sections has been carried out with consideration of the guidance contained in BS4142 as summarised above.

With consideration of the above guidelines and measured baseline noise levels the following building services plant noise criteria has been applied to the nearest off-site residential receptors:

- Daytime (07:00 to 23:00hrs): 55dB $L_{Aeq,T}$, and:
- Night-time (23:00 to 07:00hrs): 45dB $L_{Aeq,T}$,

Inward Impact

The potential for an inward noise impact on the residential aspects of the development will be assessed using guidance contained within British Standard BS 8233:2014 Guidance on sound insulation and noise reduction for buildings. The recommended design goals for internal ambient noise levels as per the guidance contained within BS 8233 are detailed in Table 10.6 overleaf. The noise levels are specified as an Equivalent Continuous Noise Level (L_{Aeq}) expressed over the time periods referenced, there is also a specified instantaneous maximum value (L_{AFmax}) for the duration of the night period.

Table 10.6 Recommended Internal Noise Level Specifications

Location	Activity	Period	Criterion
Living / Dining Room	Resting	Daytime (07:00hrs to 23:00hrs)	35 dB $L_{Aeq,16hr}$
	Dining		40dB $L_{Aeq,16hr}$
Bedroom	Daytime Resting		35 dB $L_{Aeq,16hr}$
	Sleeping	Night-time (23:00hrs to 07:00hrs)	30 dB $L_{Aeq,8hr}$
			45 dB L_{AFmax}

Vibration Criteria

The following construction vibration limits are proposed for the development.

Table 10.7 Allowable Vibration During Construction Phase

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:-		
Less than 15Hz	15 to 40Hz	40Hz and above
12 mm/s	20 mm/s	50 mm/s

There are no operational sources of vibration expected from this development.

10.5.2 Impact Assessment

Construction Phase

The construction phase of the project will be undertaken within the bounds of the existing permitted construction site. Given the ground preparation works, excavation and foundation works of the permitted development are substantially complete, the construction phase relating to the proposed development will predominately involve building works associated with the above ground construction.

The majority of works to be undertaken will therefore comprise construction of the buildings involving use of cranes, mobile plant, and manual works. There will be vehicular movements to and from the site that will, out of necessity, make use of existing roads.

Construction Noise

Given that works during any phase will be transient in nature and will involve the use of several different plant items at any one time, it is difficult at this stage of the assessment to state accurately what items of plant will be in use and what levels of noise will be experienced during construction works.

The construction works associated with the apartment structure will make use of the mobile and tower cranes positioned within the site as part of the ongoing works. Other site activities from smaller lifting equipment, mobile plant, compressors, generators etc. will also be in use.

For the purpose of preparing construction noise calculations relating to the proposed development, an overall sound power level of 115dB $L_{W(A)}$ for this work has been used. This level is equivalent to 5 items of construction plant operating simultaneously with a sound pressure level of 80dB L_{Aeq} each at a distance of 10m. Given the range of activities during any one phase, this is considered to provide a good approximation of noise from a busy site.

The closest noise sensitive buildings to the proposed development are typically 15m beyond the site boundary. For the purpose of this assessment and to present a typical situation rather than a worst-case assessment the distance from construction works to the nearest sensitive location is assumed to be 40m.

Indicative construction noise levels based on the above assumptions are calculated at 68dB L_{Aeq} at the closest noise sensitive locations. The calculated noise levels are within the recommended construction noise limits outlined in Table 10.4.

Notwithstanding the above, it will be a requirement of the contractor to ensure that all best practice measures relating to the control and minimisation of noise and vibration are employed during all phases of work including ongoing works associated with the permitted rejuvenation scheme. Further details are set out in Section 10.7.1 of this document.

Construction Vibration

There are no significant vibration sources expected during the construction phase of the proposed development as no intrusive ground works, foundations or excavation works are required as they have already been substantially completed. In this regard, vibration levels at the closest neighbouring buildings are expected to be orders of magnitude below the limits set out in Table 10.7 to avoid any cosmetic damage to buildings.

Operational Phase

Outward Impact

During the operational phase of the development, the following noise sources have the potential to have an outward impact on the surrounding environment:

- Car parking;
- Additional vehicles on surrounding roads, and;
- Mechanical and electrical plant.

These are discussed in turn below.

Car Parking

The proposal includes an underground car park below each block with 38 and 39 car parking spaces respectively in each.

In terms of potential noise impacts, due to the enclosed nature of the underground car parking area, activities within this area will be adequately screened from the external environment and hence noise breakout will be minimal. The overall effect is described as neutral and long term.

Additional vehicles on surrounding roads

A traffic assessment has been prepared by CS Consulting for the proposed residential development. The number of vehicle trip movements associated with the proposed apartments is determined to increase traffic on the adjoining road network by a magnitude of 1 to 9%. In terms of a noise impact traffic volumes would be required to increase by 25% to generate a 1dB change. Therefore, from a noise point of view, an increase of traffic of this magnitude will be of negligible impact (an increase of less than 0.5dB) and will not be perceptible. The overall effect is described as negligible and long term.

Mechanical and Electrical Plant

The proposed development will incorporate new plant areas at basement level and a new plant area at roof level above Block 02. Of these areas the roof plant will have the greatest potential to generate a noise impact, whereas the basement plant noise will be contained within the basement itself. The specific details of the plant items within these areas is not yet fully known at this stage of the assessment, it is therefore best practice to set appropriate operational limits which can be used as part of the detailed design.

The operational noise criteria outlined in Section 10.5.1 will be used to assess the operation of any new plant items. In summary, any new mechanical or electrical plant will be required to have a cumulative noise level which does not exceed the following operational limits at the nearest offsite noise sensitive locations:

- 55dB $L_{Aeq,1\ hour}$ during daytime periods, and;
- 45dB $L_{Aeq\ ,\ 5mins}$ during night-time periods.

Noise emissions from any operational plant items should have no tonal or impulsive characteristics.

The selection of plant items will need to be fully considered at detail design stage to ensure that the type, number and location of plant items with noise emissions to atmosphere are suitably selected to ensure the limit values above are complied with.

Inward Impact

During the operational phase of the development, the following noise sources have the potential to have an inward impact on the development itself:

- Noise from existing road traffic and Luas movements;
- Noise emissions from the existing Spencer Dock Pumping Station;
- Noise transfer internally between amenity spaces and residential spaces, and;
- Mechanical and electrical plant serving the development.

These are discussed in turn below.

Inward Noise Impact from Existing Road and Luas Movements

Appendix 10.1 presents a detailed assessment of the proposed development to determine the potential inward noise impact on the development due to the existing road and luas traffic in the surrounding area. The assessment in Appendix 10.1 details an acoustic specification for the building façade to ensure that the internal ambient noise levels within the development achieve the design goals previously listed in Table 10.6. These façade specifications are summarised in Section 10.7 of this chapter.

Noise Emissions for the Spencer Dock Pumping Station

Appendix 10.2 presents a detailed assessment of the potential noise and vibration impact of the existing Spencer Dock Pumping Station on the proposed development. This assessment was prepared to respond to a request for further information from the Planning Authority as part of the application for the permitted development. It has concluded, based on measurements of the noise and vibration emissions from the pumping station and calculations, that the noise and vibration levels from the existing pumping station are low and will not have a negative impact on the proposed development.

Noise Transfer Internally between Amenity Spaces and Residential Spaces

Appendix 10.3 presents an assessment of the potential for non-residential amenity spaces proposed for the development to have a negative noise impact on the residential dwellings within the development. It is concluded that as part of the detailed design and compliance with Part E of the Building Regulations 2014, suitable separating constructions will be implemented to ensure that reasonable resistance to airborne and impact sound is provided between these areas.

Noise Impact from New Mechanical and Electrical Plant

The noise emissions from new mechanical and electrical plant discussed previously in this Chapter have also been assessed to ensure that there will be no negative impact on the development itself. This assessment has found that once the acoustic specification for the façade is taken into account, as discussed in Appendix 10.1, the noise impact internally within the development due to the operation of mechanical or electrical plant will not be significant and in all instances the internal ambient noise levels are below the levels specified in Table 10.6.

10.6 POTENTIAL CUMULATIVE IMPACT

Traffic volumes associated with the operational phase assessed within this chapter take account the proposed traffic volumes on the surrounding road network with other nearby developments also in operation. Cumulative noise impacts associated with the traffic generated from other developments in the surrounding environment have therefore been assessed within this chapter.

Construction noise impacts associated with the adjacent developments being constructed at the same time will contribute to a higher noise environment at the nearest noise sensitive locations during certain periods of construction. However, given that the majority of the works will occur away from the nearest sensitive locations any additional noise and vibration impact as a result of the adjacent developments is likely to be temporary in nature.

The operation of any mechanical or electrical services associated with the proposed adjacent developments will be designed by the relevant design teams to ensure that the cumulative noise levels do not exceed the relevant noise criteria. The overall impact is deemed to be long-term and not significant.

10.7 DO NOTHING IMPACT

Should the proposed development not take place, noise emissions associated with the permitted scheme are expected to be similar to those presented here. There are no planned changes to operating hours, delivery schedules, operating plant or car parking under this scenario; hence the overall impact from the Do Nothing scenario is neutral.

10.8 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

10.8.1 Construction Phase

With regard to construction activities, best practice operational and control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) Parts 1 and 2.

BS 5228 includes guidance on several aspects of construction site practices, including, but not limited to:

- liaison with the Public;
- noise monitoring;
- selection of quiet plant;
- control of noise sources, and;
- screening (boundary, and or localised plant screening).

Detailed comment is offered on these items in the following paragraphs. Noise control measures that will be considered include liaison with the public, noise monitoring, the selection of quiet plant, enclosures and screens around noise sources and limiting the hours of work.

Liaison with the Public

The Contractor will provide proactive community relations and will notify the public and sensitive premises before the commencement of any works forecast to generate appreciable levels of noise or vibration, explaining the nature and duration of the works. The Contractor will distribute information circulars informing people of the progress of works and any likely periods of significant noise and vibration.

A designated noise liaison should be appointed to site during construction works. Any complaints should be logged and followed up in a prompt fashion. In addition, prior to particularly noisy construction activity, e.g. rock breaking, piling, etc., the site contact should inform the nearest noise sensitive locations of the time and expected duration of the works. It is understood that such operations are implemented to date in relation to the site in terms of recent construction works and in relation to day to day activities associated with existing site operations. These measures will be continued during the construction phase of the proposals considered in this assessment.

Noise Monitoring

During the construction phase consideration should be given to noise monitoring at the nearest sensitive locations. Again, as part of current site management a number of permanent noise monitors are managed and maintained in order to monitor noise emissions from the site. This practice will be continued as part of the proposed construction works associated with the development works under consideration here.

Noise monitoring is and will be conducted in general accordance with the International Standard *ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise*.

Selection of Quiet Plant

This practice is recommended in relation to sites with static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures where possible. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.

Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration should be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

BS5228 states that "*as far as reasonably practicable sources of significant noise should be enclosed*". In applying this guidance, constraints such as mobility, ventilation, access and safety must be taken into account. Items suitable for enclosure include pumps and generators. Demountable enclosures will also be used to screen operatives using hand tools and will be moved around site as necessary.

BS5228 makes a number of recommendations in relation to "*use and siting of equipment*". These recommendations will be adopted on site.

"*Plant should always be used in accordance with manufacturers' instructions. Care should be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading should also be carried out away from such areas. Special care will be necessary when work has to be carried out at night.*

Circumstances can arise when night-time working is unavoidable. Bearing in mind the special constraints under which such work has to be carried out, steps should be taken to minimise disturbance to occupants of nearby premises.

Machines such as cranes that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. Machines should not be left running unnecessarily, as this can be noisy and waste energy.

Acoustic covers to engines should be kept closed when the engines are in use and idling. The use of compressors that have effective acoustic enclosures and are designed to operate when their access panels are closed is recommended.

Materials should be lowered whenever practicable and should not be dropped. The surfaces on to which the materials are being moved could be covered by resilient material."

All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

Screening

Screening is typically an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen and its position relative to both the source and receiver.

The length of the screen should in practice be at least five times the height; however, if shorter sections are necessary then the ends of the screen should be bent around the source. The height of any screen should be such that there is no direct line of sight between the source and the receiver. For critical areas in close proximity to the works where other forms of noise control measures do not sufficiently reduce noise levels below the significant criteria, a standard 2.4m high hoarding is recommended around the site perimeter.

BS 5228 states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the barrier should be such that there are no gaps or openings at joints in the screen material. In most practical situations the effectiveness of the screen is limited by the sound transmission over the top of the barrier rather than the transmission through the barrier itself. In practice screens constructed of materials with a mass per unit of surface area greater than 7 kg/m^2 will give adequate sound insulation performance.

In addition, careful planning of the site layout should also be considered. The placement of site buildings such as offices and stores and in some instances materials such as topsoil or aggregate can provide a degree of noise screening if placed between the source and the receiver.

The use of mobile localised screens should also be considered for use around items of high noise levels. Mobile screens also have the benefit of placing the screen close to the source in addition to screening the plant item of concern from the closest noise sensitive locations, depending on its location on site.

10.8.2 Operational Phase

Mitigation measures to control noise and vibration during the operational phase of the residential extension are set out below.

Outward Impact

Car Parking on the Site

The noise impact assessment outlined above has demonstrated that mitigation measures are not required.

Additional Vehicular Traffic on Public Roads

The noise impact assessment outlined in this chapter has demonstrated that mitigation measures are not required.

Mechanical and Electrical Plant

A design goal has been set for building services plant at the nearest noise sensitive locations in order to avoid any significant increase to the existing noise environment. In order to achieve the design goal, best practice control measures will be adopted during the detailed design stage. This will typically involve the following forms of noise control techniques:-

- selection of plant with low noise and vibration emissions;

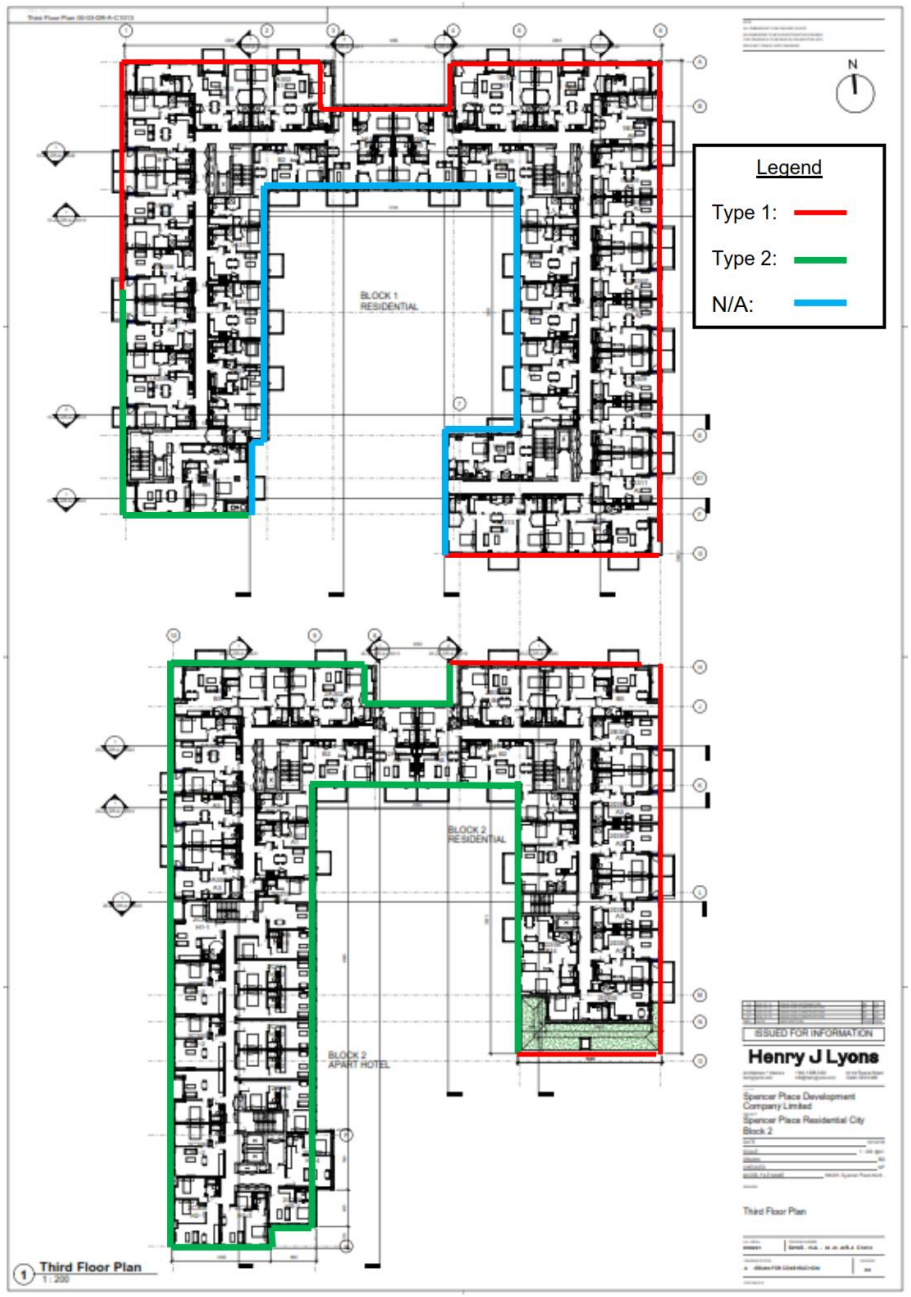
- provision of solid barriers or acoustic louvered panels screening external plant;
- installation of duct mounted attenuators on the atmosphere side of air moving plant;
- installation of splitter attenuators or acoustic louvres providing free ventilation to internal plant areas, and;
- anti-vibration mounts on reciprocating plant.

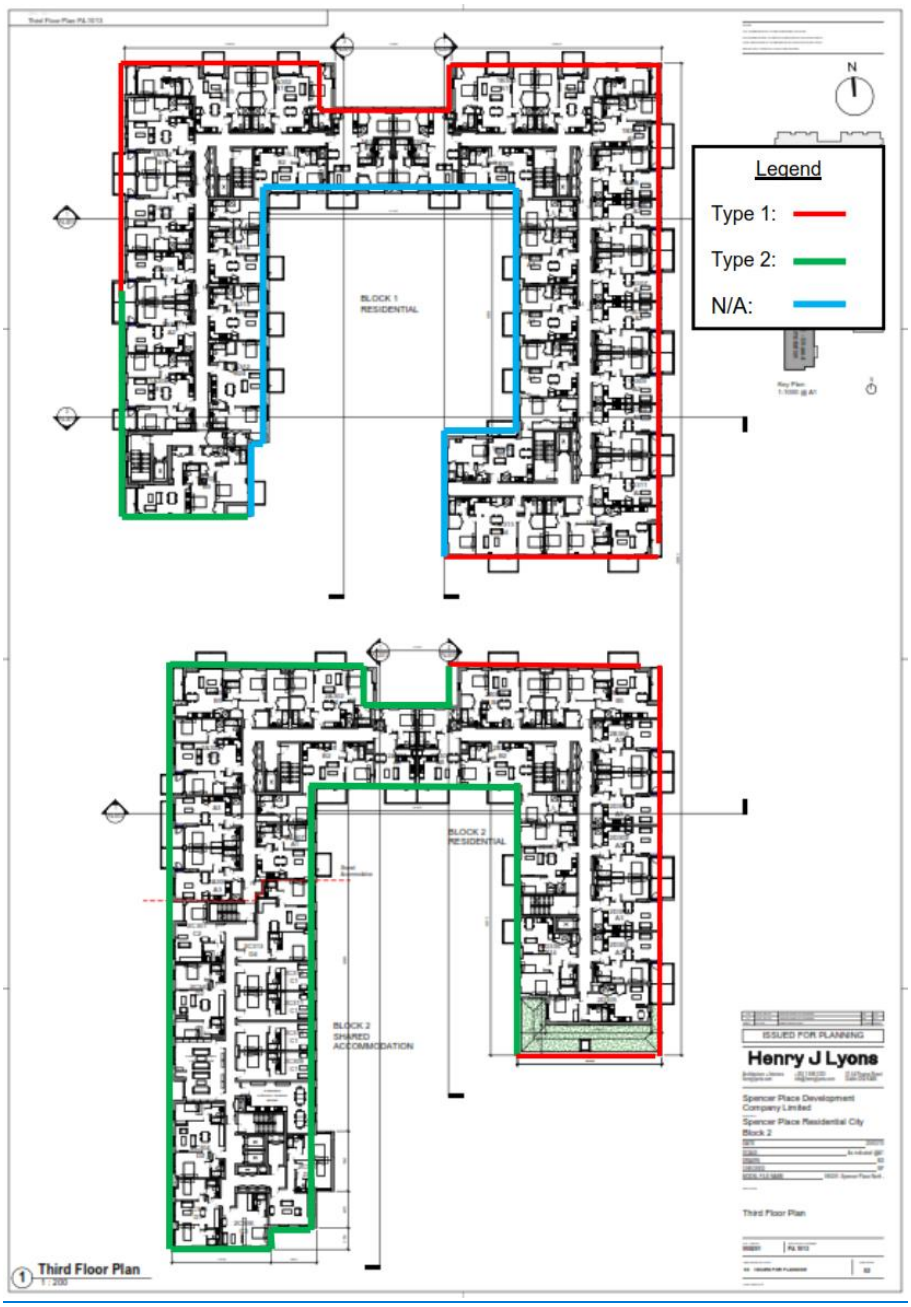
Inward Impact

Inward Noise Impact from Existing Road and Luas Movements

The assessment detailed in Appendix 10.1 has identified two façade specifications for the development. The two façade areas are marked up in Figure 10.2. The area marked-up as Type 1 Façade requires a slightly increased sound insulation performance achieved in this instance by incorporating enhanced glazing.

Figure 10.2 Acoustic Performance of the Façade


N
Legend
Type 1:
Type 2:
N/A:
BLOCK 1
RESIDENTIAL
BLOCK 2
RESIDENTIAL
BLOCK 2
APART HOTEL
ISSUED FOR INFORMATION
Henry J Lyons
Spencer Place Development Company Limited
Spencer Place Residential City
Block 2
Third Floor Plan
1 Third Floor Plan
1: 200



Façade gazing for Type 1 and Type 2 elevations should be selected to achieve the minimum sound insulation performance as outlined in Table 4.

Table 10.8 Minimum Sound Reduction Indices (SRI) for Façade

Façade Spec, R_w (dB)	Octave Band Centre Frequency (Hz)						Overall R_w (dB)
	125	250	500	1k	2k	4k	
Type 1	30	35	42	45	45	43	44
Type 2	27	33	39	40	40	42	40

Noise Emissions for the Spencer Dock Pumping Station

The noise impact assessment outlined in this chapter has demonstrated that mitigation measures are not required.

Noise Transfer Internally between Amenity Spaces and Residential Spaces

The noise impact assessment outlined in this chapter has demonstrated that mitigation measures are not required.

Noise Impact from New Mechanical and Electrical Plant

The noise impact assessment outlined in this chapter has demonstrated that mitigation measures are not required.

10.9 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

The predicted residual impacts of the development are set out below taking account of the predicted impacts and control measures.

10.9.1 Construction Phase

During the construction phase of the project there will be short term impacts on some of the nearby properties due to noise emissions from activity on-site and truck movements to and from the site.

The application of binding noise limits, monitoring, controlled working hours, along with implementation of appropriate noise and vibration mitigation measures as set out above, will ensure that noise and vibration impact is sufficiently controlled to within the relevant criteria.

With mitigation measures implemented and construction limits adhered to, the proposed development will result in and overall effect described as moderate and short term.

10.9.2 Operational Phase

Outward Impact

Car Parking on the Site

The impact from the car parking arrangements within the site are not considered to generate any increase to the noise environment at the nearest properties. The overall effect is described as imperceptible and long term.

Additional Vehicular Traffic on Public Roads

The impact from additional vehicular traffic on the surrounding road network and junctions is determined to be negligible and imperceptible. The overall effect is described as imperceptible and long term

Mechanical and Electrical Plant

The impact from any additional mechanical and electrical plant use to service the new buildings will be designed to comply with the day and night-time noise criteria set. Assuming the adopted criteria are not exceeded, the overall effect is described as slight and long term.

Inward Impact

Inward Noise Impact from Existing Road and Luas Movements

The inward noise impact from existing road and Luas traffic movements will be, with the implementation of the minimum façade specifications defined in Section 10.7, achieve good internal ambient noise levels. The overall effect is described as neutral and long term.

Noise Emissions for the Spencer Dock Pumping Station

The noise and vibration impact from the existing Spencer Dock Pumping Station has an overall effect that is described as imperceptible and long term.

Noise Transfer Internally between Amenity Spaces and Residential Spaces

The noise impact from amenity spaces on residential spaces has an overall effect that is described as imperceptible and long term.

Noise Impact from New Mechanical and Electrical Plant

The noise impact from new mechanical and electrical plant serving the development on the development itself has an overall effect that is described as imperceptible and long term.

10.10 MONITORING

10.10.2 Construction Phase

During the construction phase noise monitoring will be conducted in accordance with the International Standard ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise* and survey locations should be located a distance of greater than 3.5m away from any reflective surfaces, e.g. walls, in order to ensure a free-field measurement without any influence from reflected noise sources.

10.10.2 Operational Phase

There are no proposed noise or vibraiton monitoring requirements during the operational phase.

10.11 REINSTATEMENT

Not applicable

10.12 INTERACTIONS

This chapter has been compiled with reference to the main design drawings and project descriptions, details on the construction phase provided by the project manager / applicant and the transport report.

10.13 DIFFICULTIES ENCOUNTERED IN COMPILING

No difficulties were encountered in compiling this chapter.

10.14 REFERENCES

British Standard BS 5228 (2009 +A1 2014): Code of Practice for Control of Noise and Vibration on Construction and Open Sites *Part 1: Noise & Part 2: Vibration.*

British Standard BS 7385 (1993): *Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration*.

British Standard BS 4142 (2014): *Methods for rating and assessing industrial and commercial sound*

Calculation of Road Traffic Noise, Department of Transport Welsh Office, HMSO, 1988

Dublin Agglomeration Action Plan Relating to the Assessment and Management of Environmental Noise (July 2013 – November 2018).

EPA: *Guidance Note for Noise – Licence Applications, Surveys and Assessments in Relation to Scheduled Activities NG4* (2016).

ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise.*

ISO 9613 (1996): *Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation.*

Chapter 11

Material Assets – Traffic

11.0 MATERIAL ASSETS – TRAFFIC

11.1 INTRODUCTION

This Chapter of the EIAR assesses any likely or significant impacts associated with traffic and transport issues arising from the proposed development. The report presents an assessment of both the operational and construction stages of the proposed development. The focus of the assessment is however primarily on the operational stage, which is anticipated to have a greater impact on the prevailing environment than the construction stage. Relevant mitigation measures are also presented in this chapter.

This chapter has been prepared by Gordon Finn, BA, BAI, MAI, MIEI, Roads and Traffic Engineer with Cronin & Sutton Consulting Engineers (CS Consulting). This assessment is based in part on the outcome of the Traffic Impact Assessment (TIA) prepared by CS Consulting and submitted separately in support of this SHD planning application.

11.2 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A full description of the proposed development is set out in Chapter 2 of this EIAR. Briefly, the proposed residential development comprises 464no. residential apartment units and 84no. shared accommodation units in two blocks, each over a basement-level car park. At surface level, the development incorporates the north-south access road between Sheriff Street Upper and Mayor Street Upper, as planned under the *North Lotts and Grand Canal Dock Planning Scheme 2014*. The southern part of this access road shall be restricted to one-way operation in the northbound direction.

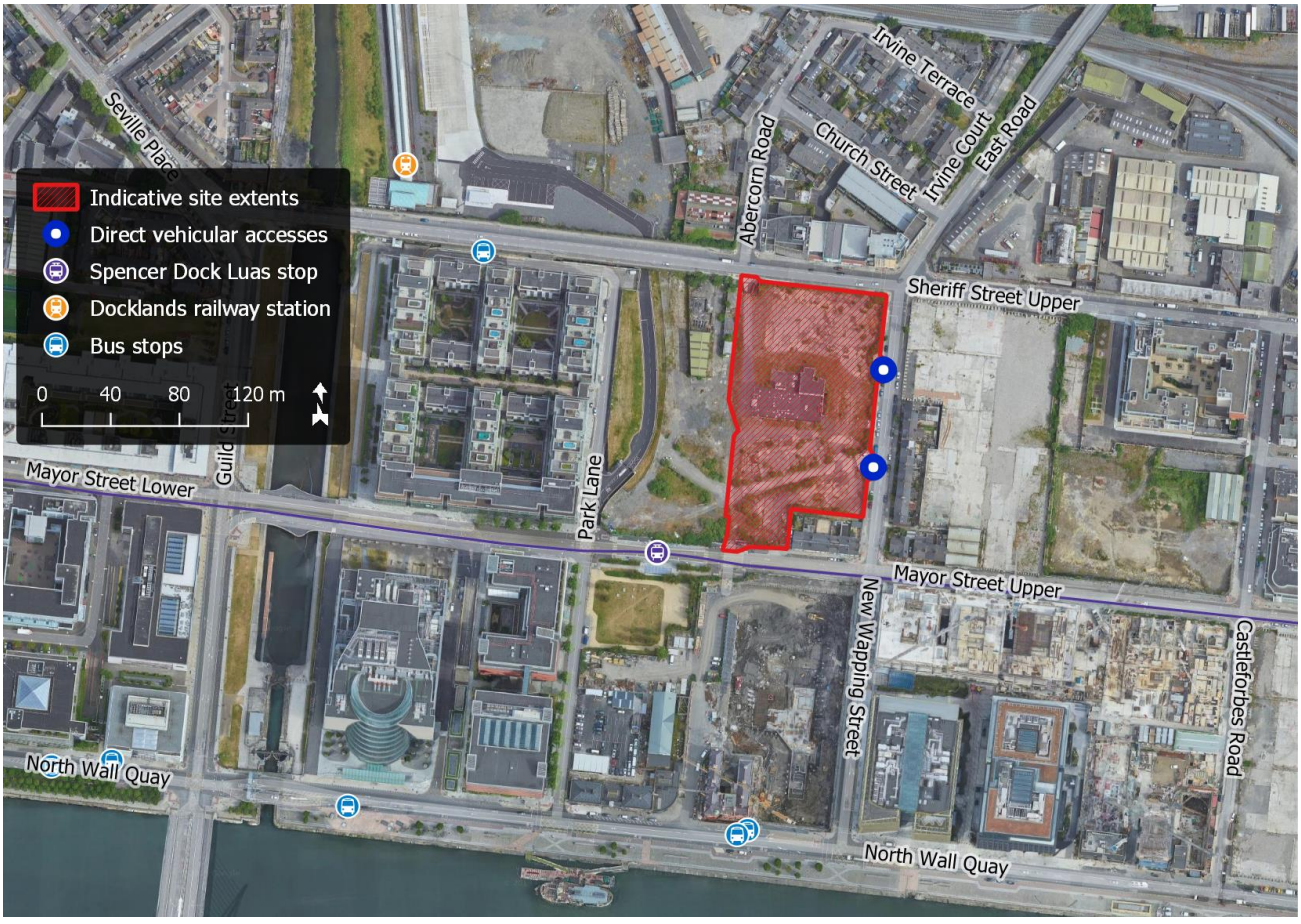


Fig. 11.1: Elements of surrounding street network: Sources: NTA, OSi, OSM Contributors, Google

A total of 78no. car parking spaces and 726no. bicycle parking spaces are to be provided in the 2no. basement-level car parks, with vehicular access to each of these being from new priority-controlled junctions on New Wapping Street. A further 26no. publicly accessible car parking spaces are to be provided at surface level along the new north-south access road between Sheriff Street Upper and Mayor Street Upper, and a further 94no. visitor bicycle parking spaces are to be situated at ground floor level (76no. spaces of which shall be located externally and be publicly accessible).

11.3 STUDY METHODOLOGY

11.3.1 PEAK HOUR IDENTIFICATION

A 12-hour classified vehicular traffic count survey was undertaken on Wednesday the 4th of October 2017 by Nationwide Data Collection (NDC), on behalf of CS Consulting. This survey was conducted between 07:00 and 19:00, at 2no. junctions on New Wapping Street. The surveyed traffic flows were then scaled up using TII growth factors to obtain background traffic flows for the baseline year of 2019.

Including Luas movements, the weekday peak hour background traffic flows at this junction were found to occur between 07:45 and 08:45 (AM peak hour) and between 17:00 and 18:00 (PM peak hour).

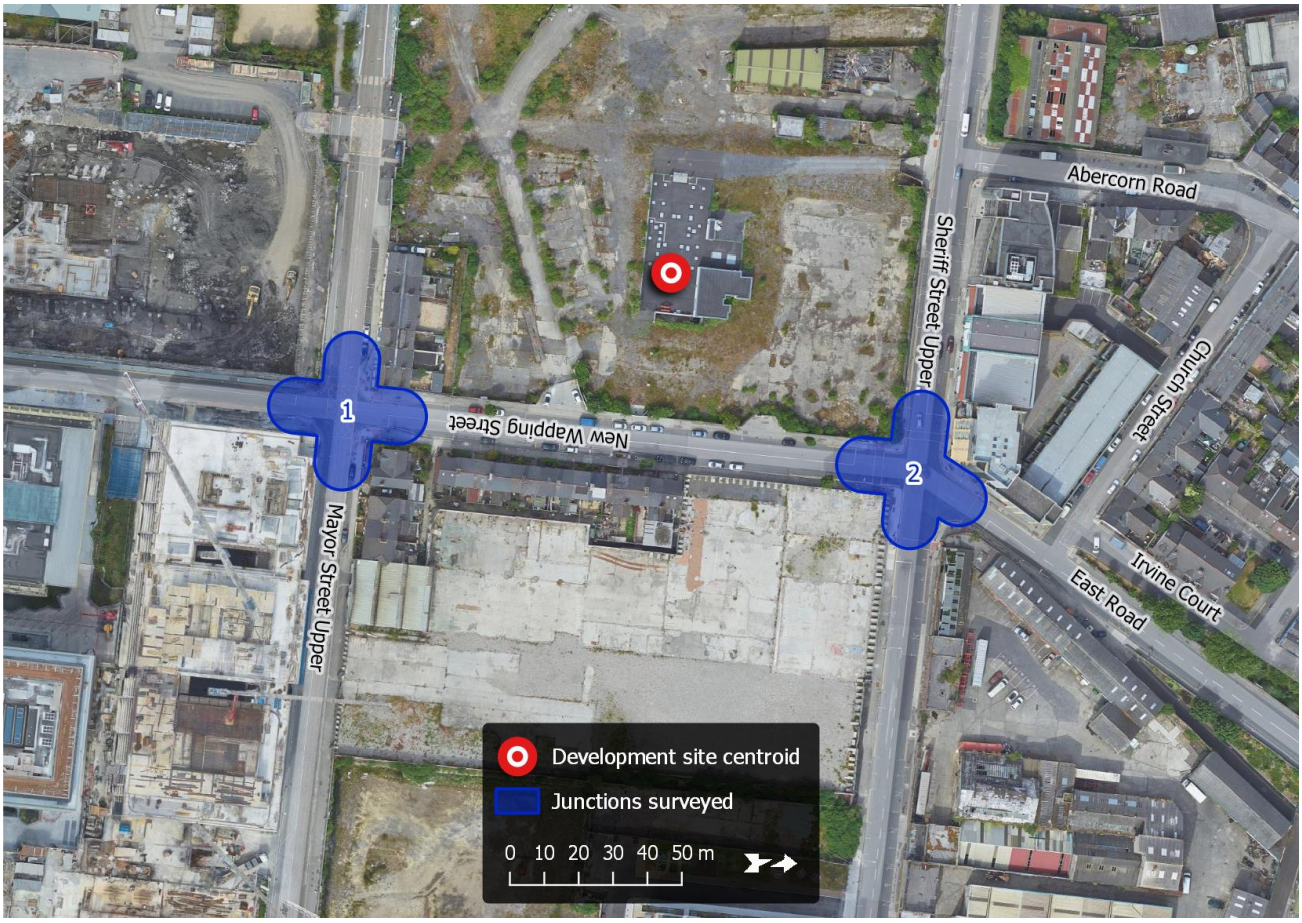


Fig. 11.2: Surveyed road junction sites: Sources: OSM Contributors, Google

11.3.2 VEHICULAR TRIP GENERATION OF SUBJECT DEVELOPMENT

Trip generation factors from the industry-standard TRICS database have been used to predict the trip generation to and from the proposed development, for both the AM and PM peak hour periods. The TRICS sub-categories '03 Residential / C – Flats Privately Owned' and '02 Residential / G – Student Accommodation' have been employed, as these represent the available sub-categories most applicable to the subject development.

The TRICS trip rates for the proposed development have been selected from the above sub-categories, restricted insofar as possible to similar locations at the edges of city centres, and further refined with reference to 2016 CSO census data on the basis of:

- the population within 1 mile of the development site (55,000 approx.);
- the population within 5 miles of the development site (685,000 approx.);
- the aggregate mean car ownership rate within 5 miles of the development site (0.94 cars per household).

Table 11.1: Selected TRICS Trip Rates

	Arrivals		Departures	
	Vehicles per hour per apartment	Vehicles per hour per shared acc. resident	Vehicles per hour per apartment	Vehicles per hour per shared acc. resident
AM Peak	0.033	0.005	0.098	0.004
PM Peak	0.134	0.003	0.092	0.001

Vehicular trip numbers were calculated as a function of the TRICS trip rates given above and the total numbers of residential units (464no. apartments) and shared accommodation residents (200no. residents) within the proposed development. The following trip generation figures were calculated for the development as a whole:

Table 11.2: Subject Development Trip Generation

	Arrivals (vehicles)	Departures (vehicles)	Total Trips (vehicles)
AM Peak	16	46	62
PM Peak	63	43	106

11.3.3 VEHICULAR TRIP GENERATION OF NEARBY COMMITTED DEVELOPMENTS

Fig. 11.3: Relevant nearby committed developments: Sources: DCC, OSM Contributors, Google

In addition to the subject development, vehicular trips predicted to be generated by committed developments in the vicinity of the subject site were included in the background traffic flows for future assessment years. Trips to be generated by committed developments under the following register references were included:

- DSDZ2661/17 (mixed use development comprising 47,057m^2 office space and a hotel with a total GFA of 9,205m^2, with vehicular access to/from New Wapping Street, between Mayor Street Upper and North Wall Quay)
- DSDZ3357/17 (residential development comprising 360no. apartments, with 283no. car parking spaces at basement level and vehicular access to/from New Wapping Street)

The predicted trip generation for the above committed developments is given in Table 11.3. Further detail on the calculation of these figures (including the relevant TRICS data employed) is given in the Traffic Impact Assessment report prepared in support of this SHD planning application.

Table 11.3: Committed Development Trip Generation

	Arrivals (vehicles)	Departures (vehicles)	Total Trips (vehicles)
Committed Development DSDZ2661/17			
AM Peak Hour	134	40	174
PM Peak Hour	35	135	170
Committed Development DSDZ3357/17			
AM Peak Hour	12	35	47
PM Peak Hour	48	33	81

11.3.4 VEHICULAR TRIP DISTRIBUTION

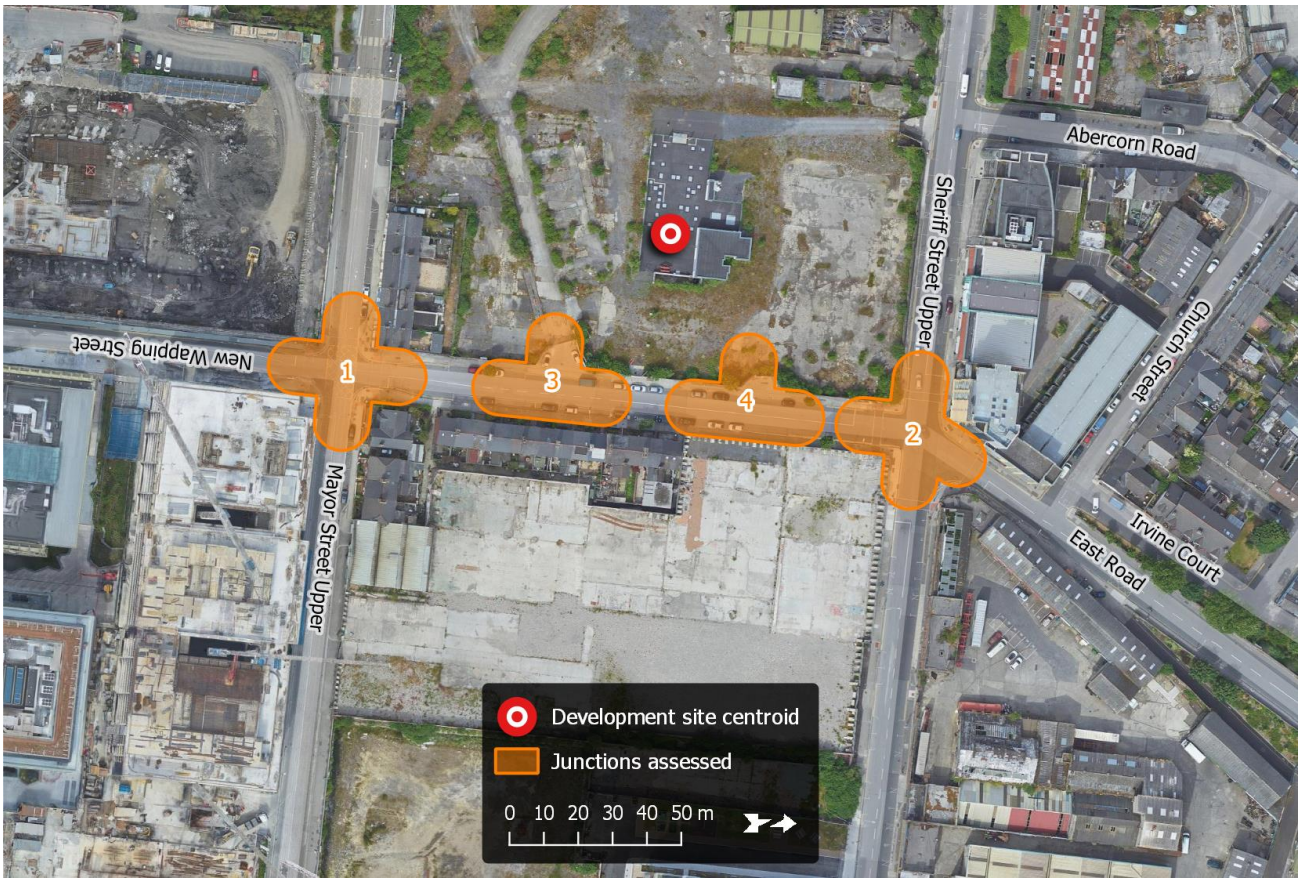


Fig. 11.4: Road junction assessed: Sources: OSM Contributors, Google

The following junctions were included in the scope of the Traffic Impact Assessment modelling:

J1. New Wapping Street / Mayor Street Upper
(surveyed existing 4-arm signal-controlled junction)

J2. East Road / Sheriff Street Upper / New Wapping Street
(surveyed existing 4-arm signal-controlled junction)

J3. New Wapping Street / Development Access (South)
(proposed new 3-arm priority-controlled junction)

J4. New Wapping Street / Development Access (North)
(proposed new 3-arm priority-controlled junction)

It has been assumed that vehicles entering and exiting the development from and to New Wapping Street (at Junctions 3 and 4) shall follow the same north/south directional splits as those currently observed for traffic entering and exiting Sheriff Street Upper (West) from and to East Road and New Wapping Street, at the surveyed Junction 2. At the 2no. surveyed junctions (Junctions 1 and 2), it is assumed that vehicular traffic to and from the subject development shall be distributed according to the directional splits currently observed at these junctions. These splits, for both the AM and PM peak periods, are given in the Traffic Impact Assessment report prepared in support of this SHD planning application.

Vehicular traffic to and from the committed residential development to the east of the subject site (planning application ref. DSDZ3357/17) has been distributed in the same manner as the subject development. Initial trip distribution for the committed hotel and office development at Spencer Place, to the south (planning application ref. DSDZ2661/17) has been adopted from the Traffic and Transportation Report prepared and submitted by CS Consulting in relation to this planning application; these traffic flows have then been distributed at the 2no. surveyed junctions according to the directional splits currently observed at these junctions.

11.3.5 OPERATIONAL ASSESSMENT

The operational performance of the 4no. existing road junctions listed above was assessed using industry-standard TRANSYT software. An integrated model was constructed that incorporated these four linked junctions; the performance of these was then assessed under the following scenarios:

- 2019 (baseline year) – existing traffic conditions;
- 2022 (planned year of opening) – with & without subject development;
- 2027 (5 years after opening) – with & without subject development;
- 2032 (5 years after opening) – with & without subject development; and
- 2037 (design year) – with & without subject development.

For future assessment years, the surveyed background traffic flows were further scaled up using standard TII growth factors. Traffic flows relating to the committed developments described in section 11.3.3 were included in the assessment of all future year scenarios.

Junction performance was assessed under the following criteria, for each junction approach arm:

- Degree of Saturation (the ratio of current traffic flow to ultimate capacity on a link or traffic stream);
- Mean Maximum Queue (the highest estimated mean number of Passenger Car Units queued in any lane of a junction approach link, averaged over the entire analysis period);
- Mean Delay per PCU (the average delay incurred by a vehicle on a junction approach); and
- Practical Reserve Capacity (the percentage by which the arriving traffic flow on a stream could increase before the stream would reach its effective capacity).

11.4 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

Table 11.1 shows the TRANSYT modelling results for the baseline year 2019. These show that the 2no. existing junctions that were surveyed and modelled currently operate within their effective capacities on all approaches during the AM and PM peak hour periods. Queues and delays on the majority of junction approaches are low. During the AM peak, however, the northern and western approaches to Junction 2 are close to exceeding effective capacity, with significant vehicle queues and delays.

Table 11.4: Assessment Results for Baseline Year 2019 (no additional development)

Junction Approach Arm	Degree of Saturation (%)		Maximum Queue at End of Red (PCU)		Mean Delay per PCU (seconds)		Practical Reserve Capacity (%)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Existing Junction 1 (New Wapping Street / Mayor Street)								
New Wapping Street (from North)	27	9	2	1	4	7	238	952
Mayor Street Upper (from East)	24	7	1	0	61	51	270	1241
New Wapping Street (from South)	11	15	1	2	6	8	734	494
Mayor Street Upper (from West)	6	8	0	0	55	52	1402	993
Existing Junction 2 (East Road / Sheriff Street Upper / New Wapping Street)								
East Road (from North)	85	54	11	4	37	42	6	65
Sheriff Street Upper (from East)	24	17	2	2	33	15	269	415
New Wapping Street (from South)	13	33	2	2	13	26	570	176
Sheriff Street Upper (from West)	82	51	10	7	57	19	10	77

11.5 IMPACT ASSESSMENT RESULTS

11.5.1 DO-NOTHING SCENARIO

Table 11.5 shows the TRANSYT modelling results for the design year 2037, based upon the projected traffic flows for this year (including other committed developments) but not including traffic related to the subject development. These show that the existing junction of New Wapping Street with Mayor Street shall continue to operate within its effective capacity on all approaches, with vehicle queues and delays similar to those currently occurring. The existing junction of New Wapping Street with Sheriff Street Upper and East Road shall exceed its effective capacity on the northern and western approaches, with significant increases in vehicle queues and delays on these approaches during peak times; all junction approaches shall however continue to operate within ultimate capacity.

Under the Do-Nothing Scenario, background traffic growth and the addition of vehicular traffic related to committed developments (excluding the subject development) are therefore likely to have a long-term significant adverse impact on the operational efficiency of the 2no. existing junctions assessed. This impact should be considered reversible to a degree, as any future measures that reduce local vehicular traffic volumes (e.g. improvements in public transport or cycling infrastructure, traffic signalling redesign, or changes in general traffic flow restrictions) have the potential to improve the operational efficiency of these junctions.

Table 11.5: Assessment Results for Design Year 2037 (without subject development)

Junction Approach Arm	Degree of Saturation (%)		Maximum Queue at End of Red (PCU)		Mean Delay per PCU (seconds)		Practical Reserve Capacity (%)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Existing Junction 1 (New Wapping Street / Mayor Street)								
New Wapping Street (from North)	37	11	3	1	5	6	144	720
Mayor Street Upper (from East)	30	9	1	0	63	52	199	932
New Wapping Street (from South)	14	26	2	3	7	9	532	241
Mayor Street Upper (from West)	6	12	0	0	55	54	1377	649
Existing Junction 2 (East Road / Sheriff Street Upper / New Wapping Street)								
East Road (from North)	97	55	18	5	67	36	-7	63
Sheriff Street Upper (from East)	28	22	2	2	35	20	222	301
New Wapping Street (from South)	20	48	3	4	13	23	358	86
Sheriff Street Upper (from West)	97	63	16	9	102	28	-7	43

11.5.2 CONSTRUCTION PHASE

Junction performance assessment has not been conducted for the construction phase of the development.

As an indicative estimate, development traffic during the construction phase is likely to reach at most 80 vehicle movements per day at its peak (a maximum of approx. 16PCU/hr in each peak hour period, including both arrivals and departures). Consequently, the impact of construction traffic on the operation of the surrounding road network shall be less significant than the impact of operational traffic related to the subject development.

During the construction phase, the subject development is therefore likely to result in a short-term slight adverse impact on the operational efficiency of the 2no. existing junctions assessed, in comparison to the Baseline Scenario. This impact should be considered fully reversible, as it shall be confined to the duration of construction activity on the subject site.

11.5.3 OPERATIONAL PHASE

Table 11.6 shows the TRANSYT modelling results for the design year 2037, based upon the projected traffic flows for this year that include both other committed development traffic and operational traffic related to the subject development. Full results for all assessment years and scenarios are presented in the Traffic Impact Assessment report prepared in support of this SHD planning application.

When compared to the Do-Nothing Scenario shown in Table 11.5, the results given in Table 11.6 show that vehicular traffic related to the development in its operational phase shall have an overall slight impact upon the operation of the 2no. existing junctions assessed. Development traffic shall result in an increase of at most 4 percentage points in the degree of saturation on any junction approach during the peak hour periods, and shall not be the cause of any junction approach exceeding either effective capacity or ultimate capacity. End-of-red vehicle queues shall be increased by at most 4 Passenger Car Units on any junction approach, and vehicle delays increased by at most 12 seconds. At the junction of New Wapping Street with Mayor Street, which is

particularly sensitive due to the presence of the Luas light rail line, development-related traffic shall result in no discernible increase in end-of-red vehicle queues on any junction approach.

During the operational phase, the subject development is therefore likely to result in a long-term slight adverse impact on the operational efficiency of the 2no. existing junctions assessed, in comparison to the Do-Nothing Scenario. This impact should be considered reversible to a degree, as any future measures that reduce local vehicular traffic volumes (e.g. improvements in public transport or cycling infrastructure, traffic signalling redesign, or changes in general traffic flow restrictions) have the potential to improve the operational efficiency of these junctions generally, as well as to reduce vehicle trips to/from the subject development.

Table 11.6: Assessment Results for Design Year 2037 (including subject development)

Junction Approach Arm	Degree of Saturation (%)		Maximum Queue at End of Red (PCU)		Mean Delay per PCU (seconds)		Practical Reserve Capacity (%)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Existing Junction 1 (New Wapping Street / Mayor Street)								
New Wapping Street (from North)	38	11	3	1	5	6	138	705
Mayor Street Upper (from East)	30	10	1	0	63	53	199	828
New Wapping Street (from South)	15	28	2	4	7	8	517	218
Mayor Street Upper (from West)	6	14	0	0	55	56	1377	534
Existing Junction 2 (East Road / Sheriff Street Upper / New Wapping Street)								
East Road (from North)	98	57	20	5	79	35	-9	58
Sheriff Street Upper (from East)	28	24	2	2	35	21	220	274
New Wapping Street (from South)	23	52	3	5	13	24	289	72
Sheriff Street Upper (from West)	98	67	17	10	111	31	-8	33

11.5.4 CUMULATIVE IMPACT

As is standard practice in the assessment of traffic impact, the vehicular traffic generation of other adjacent committed developments has been included by default in the operational assessments conducted both under the Do-Nothing Scenario and for the operational phase of the proposed development. The cumulative impact of the subject development, in conjunction with other committed developments and predicted background traffic growth, is therefore represented by the difference between the assessment results given in Table 11.4 (the Baseline Scenario) and those given in Table 11.6 (the design year assessment with the subject development in place).

The cumulative increase in vehicular traffic flows is therefore likely to result in a long-term significant adverse impact on the operational efficiency of the 2no. existing junctions assessed, in comparison to the Baseline Scenario. This impact should be considered reversible to a degree, as any future measures that reduce local vehicular traffic volumes (e.g. improvements in public transport or cycling infrastructure, traffic signalling redesign, or changes in general traffic flow restrictions) have the potential to improve the operational efficiency of these junctions generally, as well as to reduce vehicle trips to/from the subject development.

11.5.5 HUMAN HEALTH AND RISK OF ACCIDENTS

The vehicular traffic flows that shall be generated by the subject development may result in corresponding changes to air quality and noise levels in the vicinity of the surrounding road network. The natures and extents of these changes, and their potential to impact upon human health, are examined in Chapters 6 and 7 of this EIAR.

In the 10-year period from 2005 to 2014 (inclusive), 3no. road traffic collisions were recorded on New Wapping Street and on Sheriff Street Upper, within 200m of the proposed development accesses (each of which resulted in minor injury only, and none of which involved pedestrians). These included 2no. collisions on New Wapping Street and 2no. collisions on Sheriff Street Upper (one collision having occurred at the junction of these two streets). As an indicative estimate, the existing risk on either street of a road traffic collision occurring within this area in any given year is therefore approximately 20%. No collisions were recorded within this area on either Mayor Street Upper or East Road between 2005 and 2014.

The maximum increase in Average Annual Daily Traffic (AADT) flows that shall result from the subject development at any point on the surrounding road network shall be observed on New Wapping Street, in proximity to the development accesses. At this location, AADT link flows shall increase by 26% in comparison to the 2017 surveyed AADT flow. Considering solely the effect of this increase in vehicular traffic, it may be estimated that the subject development shall result in a maximum possible increase of approx. 5 percentage points in the annual risk of a road traffic collision within the area described above, from 20% risk annually to 25%.

The above represents a simplified risk calculation; other mechanisms besides traffic volumes also influence the risk of collisions, and these are highly specific to immediate road conditions. As an indicative estimate of wider influence, however, this is sufficient to demonstrate generally that the subject development shall not significantly increase the risk of road traffic collisions on the surrounding road network.

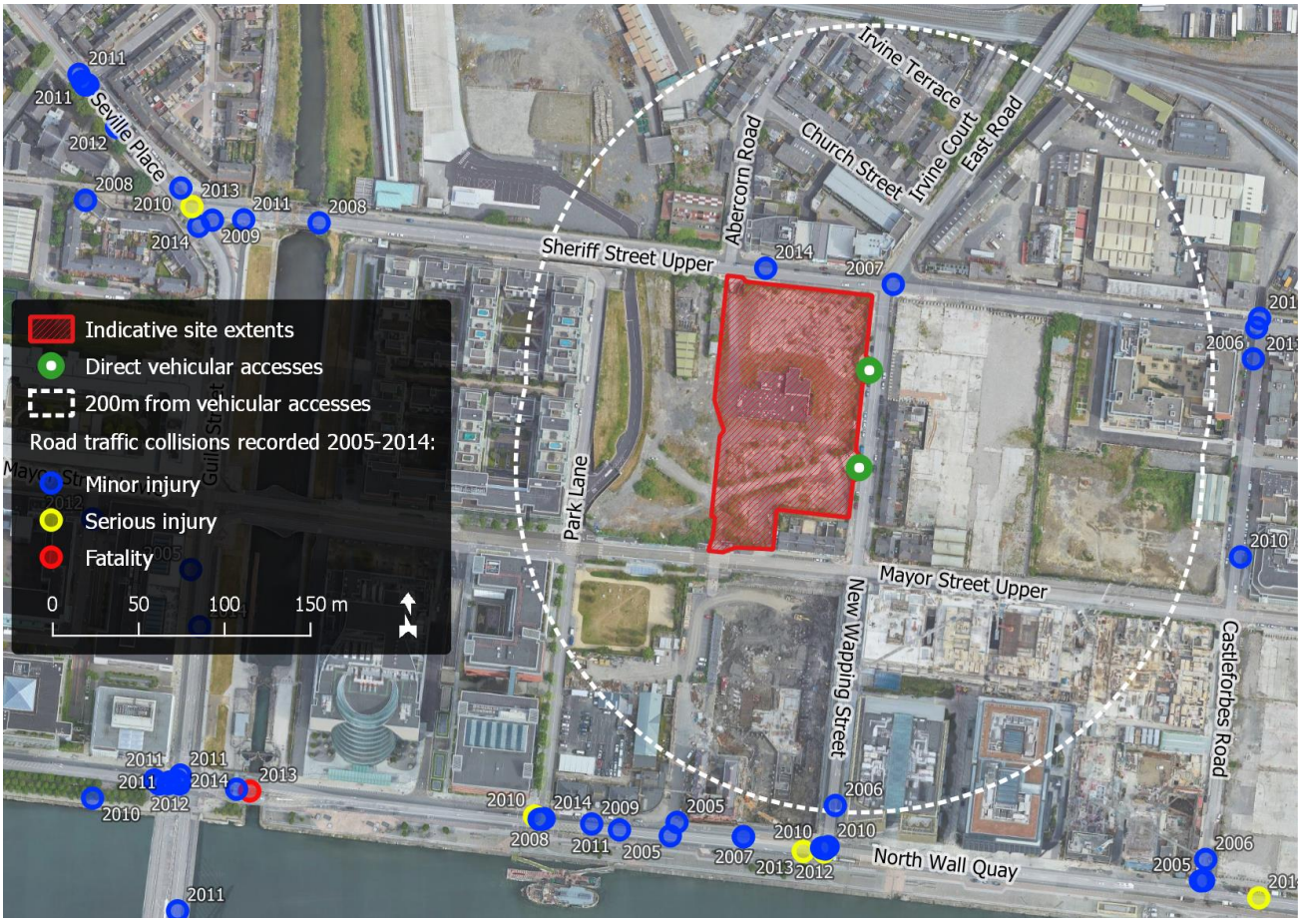


Fig. 11.5: Recorded road traffic collisions 2005-2014: Sources: RSA, OSM Contributors, Google

11.6 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

As described in the accompanying Traffic Impact Assessment report, the development shall incorporate several design elements intended to mitigate the impact of the development on the operation of the surrounding road network. These include:

- a reduced car parking provision, which shall discourage higher vehicle ownership rates and excessive vehicular trips to the development (by residents and visitors); and
- a high provision of secure bicycle parking, which shall serve to encourage bicycle journeys by both residents and visitors.

As described in the accompanying Mobility Management Plan (MMP) Framework document, the development site is situated in proximity to existing high-quality bus, rail and light rail services through Dublin City, as well as proposed future transport infrastructure. The site benefits from a location close to numerous amenities and centres of employment and is within approximately 20 minutes' walk of O'Connell Bridge, at the heart of the city centre.

As also described in the MMP Framework, a Mobility Manager shall be appointed for the proposed development, with the remit to implement and oversee an ongoing Mobility Management Plan (MMP). This shall assist residents and their visitors in making the most of sustainable transport opportunities and in avoiding single-occupant car journeys.

11.7 RESIDUAL IMPACT

In terms of traffic and transport considerations, the residual impact of the subject development is equivalent to the operational impact described in paragraph 11.5.3.

11.8 WORST CASE SCENARIO

11.8.1 CONSTRUCTION PHASE

During the development's construction phase, the worst-case scenario from a traffic and transport perspective would be an accumulation of inbound construction traffic (e.g. large deliveries or concrete mixer trucks) unable to enter the construction site and consequently obstructing traffic along New Wapping Street. The impact of such a scenario would be particularly severe if a queue of incoming construction vehicles were to extend south as far as the junction with Mayor Street Upper, potentially disrupting Luas traffic on the Red Line.

The lead contractor appointed for the construction of the development shall be required to prepare a Construction Management Plan, including a plan for the scheduling and management of construction traffic, that details the measures to be taken to mitigate the risk of such events. Approved routes for construction vehicle traffic shall be agreed with Dublin City Council.

11.8.2 OPERATIONAL PHASE

During the development's operational phase, the worst-case scenario from a traffic and transport perspective generally corresponds to the cumulative impact already assessed in section 11.5.4.

11.9 MONITORING

As described in the accompanying MMP Framework document, a Mobility Manager shall be appointed for the proposed development, with the remit to implement and oversee an ongoing Mobility Management Plan (MMP). In conjunction with this, the Mobility Manager shall be responsible for monitoring the travel habits of residents of and visitors to the development.

An MMP is a dynamic process whereby a package of measures and campaigns is identified, piloted, and then monitored on an ongoing basis. The MMP will identify specific targets against which the effectiveness of the plan can be assessed at each review; these will typically take the form of target modal splits for journeys to and from a site. The Mobility Manager shall gather data on travel patterns, for instance by conducting periodic travel surveys of residents.

11.9 REFERENCES AND SOURCES

- Trip Rate Information Computer System (TRICS)
- Transport Infrastructure Ireland (2011): *Project Appraisal Guidelines*
- Transport Infrastructure Ireland (2014): *Traffic and Transport Assessment Guidelines*
- The Chartered Institution of Highways and Transportation (1994): *Guidelines for Traffic Impact Assessments*
- Road Safety Authority (2017): *Ireland Road Collisions*
- Environmental Protection Agency (2017): *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*

11.10 DIFFICULTIES ENCOUNTERED IN COMPILING

No significant difficulties were experienced in compiling this Chapter of this EIAR document.

Chapter 12

Material Assets – Waste Management

12.0 MATERIAL ASSETS – WASTE MANAGEMENT

12.0 INTRODUCTION

This chapter comprises of an assessment of the likely impact of the proposed development on the waste generated from the development as well as identifying proposed mitigation measures to minimise any impacts.

A site-specific *Waste Management Statement for Demolition & Construction, (WMS D&C)* has been prepared by CS Consulting Engineers to deal with waste generation during the construction and demolition phases of the project. The *WMS D&C* was prepared in accordance with the *'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects'* document produced by the National Construction and Demolition Waste Council (NCDWC) in conjunction with the Department of the Environment, Heritage and Local Government in July 2006.

A separate Operational Waste Management Plan (OWMP) has also been prepared for the operational phase of the development by AWN and is included in this planning submission.

12.1 STUDY METHODOLOGY

The assessment of the impacts of the proposed development arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

This Chapter is based on the proposed development & a review of the following aspects:

- Legislative context;
- Demolition phase;
- Construction phase (including site preparation, excavation and levelling);
- Operational phase.

A desk study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the demolition, construction and operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

The waste types and estimated quantities are based on published data by the EPA in the *National Waste Reports* and *National Waste Statistics*, data recorded from similar previous developments, Irish and US EPA waste generation research, other available research sources and waste collection data from the existing neighbouring development.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal.

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 7 Land and Soil. Chapter 7 of the EIAR also discusses the environmental quality of any soils which will have to be excavated to facilitate construction of the proposed development.

12.2.1 Legislation and Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended).

In addition, the Irish government issues policy documents which outline measures aimed to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document *A Resource Opportunity – Waste Management Policy in Ireland* was published in 2012 and stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention.

The strategy for the management of waste from the construction phase is in line with the requirements of the *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* published in 2006. The guidance document *Construction and Demolition Waste Management: A handbook for Contractors and Site Managers* was also consulted in the preparation of this assessment.

There are currently no Irish guidelines on the assessment of operational waste generation and guidance is taken from industry guidelines, plans and reports including the EMR Waste Management Plan 2015 – 2021, BS 5906:2005 Waste Management in Buildings – Code of Practice, Dublin City Council (DCC) *Bye- Laws for the Storage, Presentation and Collection of Household and Commercial Waste 2013*, DCC *Dublin City Council (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws 2018,* the EPA National Waste Database Reports 1998 – 2016 and the EPA National Waste Statistics Web Resource

12.2 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SITUATION)

In terms of waste management, the receiving environment is largely defined by Dublin City Council (DCC) as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021.

The waste management plan sets the following targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The Regional Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of *"70% preparing for reuse, recycling and other recovery of construction and demolition*

waste" (excluding natural soils and stones and hazardous wastes) to be achieved by 2020. The National Waste Statistics update published by the EPA in October 2018 identifies that Ireland's current progress against this C&D waste target is at 68% and our progress against 'Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass (includes metal and plastic estimates from household WEEE)' is at 45%. Both of these targets are required to be met by December 2020 in accordance with the requirements of the Waste Framework Directive.

The Dublin City Development Plan 2016 – 2022 also sets policies and objectives for the DCC area which reflect those set out in the regional waste management plan.

In terms of physical waste infrastructure, DCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the Eastern-Midlands Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and two waste-to-energy facilities.

12.3.1 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A Full description of the development can be found in Chapter 2 of the EIAR, as an outline it is proposed to construct two number blocks comprising of 464No. Apartments & 84No. studios.

12.3.2 Demolition Phase

The current site has already commenced the development of a basement from an earlier planning permission as such there is no additional material to be removed based on this submission.

12.3.3 Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The construction contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised. If the surplus material that requires removal from site is deemed to be a waste, removal and reuse/recycling/recovery/disposal of the material will be carried out in accordance with the *Waste Management Act 1996* (as amended), the *Waste Management (Collection Permit) Regulations 2007* (as amended) and the *Waste Management (Facility Permit & Registration) Regulations 2007* (as amended). The volume of waste requiring recovery/disposal will dictate whether a Certificate of Registration (COR), permit or license is required by the receiving facility.

In order to establish the appropriate reuse, recovery and/or disposal route for the material to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous*. Environmental soil analysis will be carried out prior to removal of the material on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste including potential pollutant concentrations and leachability. It is anticipated that the surplus material will be suitable for acceptance at either inert or non-

hazardous soil recovery facilities/landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment/recovery or exported abroad for disposal in suitable facilities.

Waste will also be generated from construction workers e.g. organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided onsite during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

It should be noted that until final materials and detailed construction methodologies have been confirmed it is difficult to predict with a high level of accuracy the construction waste that will be generated from the construction of the proposed development as the exact materials and quantities may be subject to some degree of change and variation during the construction process. However, the above estimates are considered to be the worst-case scenario

12.3.4 Operational Phase

As noted in, an OWMP has been prepared for the development by AWN. The OWMP provides a strategy for segregation (at source), storage and collection of all wastes generated within the building during the operational phase including dry mixed recyclables, organic waste and mixed non-recyclable waste as well as providing a strategy for management of waste glass, batteries, WEEE, printer/toner cartridges, chemicals, textiles, waste cooking oil and furniture.

The BS5906:2005 Waste Management in Buildings – Code of Practice was considered in the estimations of the waste arising. It has been assumed that the proposed development will generate similar waste volumes over a seven-day period. It is anticipated that the conservative estimation of waste quantities from the residents will be sufficient to cover the small quantities likely to be generated in the community facilities on a weekly basis.

AWN's modelling methodology is based on data from recent published data and data from numerous other similar developments in Ireland and based on AWN's experience it is a more representative estimate of the likely waste arisings from the development.

Residential waste will be conveyed by occupants to one of two dedicated communal Waste Storage Areas (WSAs) on basement level. The bins of segregated waste/recyclables will be conveyed by the facilities management or the waste contractor via the internal roads and ramps to the temporary waste collection area, located to the south of the carpark entrance for collection/emptying by the nominated waste contractor(s). Once emptied, bins should be promptly returned to the WSAs.

Commercial tenants waste will be conveyed by the tenants to one of the three designated WSAs on ground floor level. Bins will be conveyed from the WSAs by facilities management or the waste contractor via the internal roads and ramps to the temporary waste collection area, located to the south of the carpark entrance for collection/emptying by the nominated waste contractor(s). Once emptied, bins should be promptly returned to the WSAs.

The OWMP seeks to ensure the development contributes to the targets outlined in the EMR Waste Management Plan 2015 – 2021, the DCC Bye-Laws for the Storage, Presentation and Collection of Household and Commercial Waste and the DCC Dublin City Council (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws.

Mitigation measures proposed to manage impacts arising from wastes generated during the operation of the proposed development are summarised below:

12.3 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

This section details the potential waste effects associated with the proposed development.

12.4.1 Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during demolition, excavation and construction. General housekeeping and packaging will also generate waste materials as well as typical municipal wastes generated by construction employees including food waste.

Waste materials will be required to be temporarily stored on site pending collection by a waste contractor. Dedicated areas for waste skips and bins will be identified across the site. These areas will need to be easily accessible to waste collection vehicles.

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development and on adjacent developments. The knock-on effect of litter issues is the presence of vermin within the development and the surrounding areas.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices.

Wastes arising will need to be taken to suitably registered/permitted/licenced waste facilities for processing and segregation, reuse, recycling, recovery and/or disposal as appropriate. There are numerous licensed waste facilities in the Eastern Midlands region which can accept hazardous and non- hazardous waste materials and acceptance of waste from the proposed development would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. Where possible, waste will be segregated into reusable, recyclable and recoverable materials. The majority of demolition and construction materials are either recyclable or recoverable.

Recovery and recycling of C&D waste has a positive impact on sustainable resource consumption, for example where waste timber is mulched into a landscaping product or waste asphalt is recycled for use in new pavements. The use of recycled materials, where suitable, reduces the consumption of natural resources.

There is a quantity of soil and stone which will need to be excavated to facilitate the proposed development. It is anticipated that there will be limited or no opportunities for reuse of the excavated material on site and so it will require removal from site for offsite reuse, recovery and/or disposal. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

The potential effect of construction waste generated from the proposed development is considered to be

short-term, not significant *and* ***neutral.***

12.4.2 Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill.

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for DCC to detail specific measures to minimise waste generation and resource consumption and provide details of the proposed waste contractors and destinations of each waste stream.

The following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that the following waste types, at a minimum, will be segregated:
  - Concrete rubble (including ceramics, tiles and bricks);
  - Plasterboard;
  - Metals;
  - Glass; and
  - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997, the EMR Waste Management Plan (2015 - 2021) and the and the DCC Bye-Laws for the Storage, Presentation and Collection of Household and

Commercial Waste and the DCC waste and draft waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources

12.4.3 Operational Phase

As previously stated, a project specific OWMP has been prepared and is included as part of this submission. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the EMR Waste Management Plan 2015 – 2021 and the DCC waste and draft waste bye-laws.

In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
  - Organic waste;
  - Dry Mixed Recyclables;
  - Mixed Non-Recyclable waste
  - Waste electrical and electronic equipment (WEEE);
  - Batteries (non-hazardous and hazardous);
  - Cooking oil;
  - Light bulbs;
  - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
  - Furniture (and from time to time other bulky waste); and

- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997*, the *EMR Waste Management Plan (2015 - 2021)* and the DCC waste and draft waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved

12.4 CUMULATIVE EFFECTS

While every effort will be made to reduce the volume of waste generated on site during the construction and operational phases, there will be a percentage of waste material which cannot be re-used or recycled.

Notwithstanding that some of this material could be used as fuel for the regional waste incinerator, which in turn powers the local district heating system.

The cumulative effect of this will mean that landfilling of some waste material will be required from the construction phase of the development. Waste material will be required to be categorised under waste classification legislation and transported and disposed of as per the requirements of the receiving landfill buy authorised agents. This will reduce the percentage of available space within the current landfills in the region.

The waste produced from the operational phrase of the development will not be required to be disposed of in regional landfills and will be disposed of at municipal waste facilities, which may include the regional incinerator. The percentage of waste from both the construction phase and the operational phase will be reduced as far as is practical.

12.5 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

The implementation of the mitigation measures will ensure that a high rate of reuse, recovery and recycling is achieved at the development during the demolition, excavation and construction phases as well as during the operational phase. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved

12.6 MONITORING

The management of waste during the construction phase should be monitored to ensure compliance with relevant local authority requirements, and effective implementation of the WMS D&C including maintenance of waste documentation.

The management of waste during the operational phase should be monitored to ensure effective implementation of the OWMP by the building management company and the nominated waste.

12.6.1 Construction Phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the demolition, excavation and construction phases where there is a potential for waste management to become secondary to progress and meeting construction schedule targets. The WMS D&C specifies the need for a waste manager to be appointed who will have responsibility to monitor the actual waste volumes being generated and to ensure that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the waste manager should identify the reasons for targets not being achieved and work to resolve any issues. Recording of waste generation during the project will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future projects.

12.6.2 Operational Phase

During the operational phase, waste generation volumes should be monitored against the predicted waste volumes outlined in the OWMP. There may be opportunities to reduce the number of bins and equipment required in the WSAs where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contractor costs.

Waste legislation should also be consulted on a regular basis in case of any changes which may impact on waste management procedures

12.7 INTERACTIONS

Adherence to the mitigation measures outlined will ensure that there are no significant impacts on resource or waste management from the proposed development. The management of waste during the construction phase in accordance with the WMS D&C and during the operational phase in accordance with the OWMP will meet the requirements of regional and national waste legislation and promote the management of waste in line with the priorities of the waste hierarchy.

12.7.1 Land and Soils

As noted previously the sites basement excavation is been completed under an earlier approved planning application.

12.7.2 Traffic and Transportation

Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the development. The increase in vehicle movements as a result of waste generated during the construction phase will be

temporary in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be imperceptible in the context of the overall traffic and transportation increase and has been addressed in Chapter 12 Material Assets – Traffic. Provided the mitigation measures detailed in Chapter 12 and the requirements of the OWMP are adhered to, the effects should be **short** to ***long-term, imperceptible*** and **neutral.**

12.7.3 Population and Human Health

The potential impacts on human beings in relation to the generation of waste during the construction and operational phases are that incorrect management of waste could result in littering which could cause a nuisance to the public and attract vermin. A carefully planned approach to waste management and adherence to the project specific C&DWMP and OWMP, will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects will be ***long-term, imperceptible*** and **neutral.**

12.8 DIFFICULTIES ENCOUNTERED IN COMPILING

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

12.9 REFERENCES

- Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate and associated legislation include:
  - European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended.
  - Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended.
  - Waste Management (Facility Permit and Registration) Regulations 2007 (S.I No. 821 of 2007) as amended.
  - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended.
  - European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014) as amended.
  - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997) as amended.
  - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
  - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
  - European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended.
  - Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended.
  - European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 191 of 2015)
  - Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended.
  - Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended.
  - The European Communities (Transfrontier Shipment of Hazardous Waste) Regulations 1988 (S.I. No. 248 of 1988)
  - European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 (S.I. No. 324 of 2011)
  - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015)
- Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
- Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
- Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015).
- Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998).
- Forum for the Construction Industry – *Recycling of Construction and Demolition Waste.*
- Department of Environment, Communities and Local Government (DoECLG), *A Resource*

Opportunity - Waste Management Policy in Ireland (2012).

- Department of Environment, Heritage and Local Government, *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* (2006).
- FÁS and the Construction Industry Federation (CIF), *Construction and Demolition Waste Management – a handbook for Contractors and Site Managers* (2002).
- Dublin City Council (DCC)*, Dublin City Develoment plan 2016-2022 (2015)*
- Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended
- EPA, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non- Hazardous* (2015)
- Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
- Environmental Protection Agency (EPA), *National Waste Database Reports 1998 – 2012*.
- EPA and Galway-Mayo Institute of Technology (GMIT), *EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned* (2015).
- BS 5906:2005 Waste Management in Buildings – Code of Practice.
- DoEHLG, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2018).
- Dublin City Council (DCC) *Bye-Laws for the Storage, Presentation and Collection of Household and Commercial Waste (2013)*
  DCC Draft *Dublin City Council (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws (2018*).

Chapter 13:

MATERIAL ASSETS – UTILITIES

13.0 MATERIAL ASSETS – UTILITIES (PART A DRAINAGE & WATER SUPPLY)

13.1 INTRODUCTION

This chapter of the Environmental Impact Assessment Report has been prepared by Robert Fitzmaurice of CS Consulting[1] for Spencer Place Development Company Limited. This chapter provides an assessment of assets (drainage & water supply elements only) for a residential development at a brownfield site located at the junction of Sherriff Street Upper and New Wapping Street, Spencer Dock, Dublin 1.

The Block 2 proposed development occupies the corner of Sheriff Street Upper (to the north) and New Wapping Street (to the east), on the north side of the River Liffey. The plot measures approximately 1.26 hectares, with the DART Underground Reservation Strip running along its west side.

The objective of the chapter is to assess the impact of the proposed development on the receiving utilities environment and to propose mitigation measures if required.

13.2 STUDY METHODOLOGY

13.2.1 Desk Study

This report was based on an examination of published sources and dialogue with third party stake holders. The following sources were consulted in the course of the study.

- *Dublin City Development Plan 2016-2022*: The current Dublin City Development Plan was consulted for a list of protected structures, the Record of Protected Structure (RPS sites), comprising schedules of buildings and items of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest that are listed for protection in the study area;

- *North Lotts and Grand Canal Dock Planning Scheme, Dublin City Council 2014*: The North Lotts and Grand Canal Dock was designated as a Strategic Development Zone (SDZ) as part of the larger Master Plan of the Dublin Docklands Development Authority. The North Lotts and Grand Canal Dock Planning Scheme was created to facilitate and guide development in this area. The conservation of the Docklands' architectural heritage is a key component of the SDZ Planning Scheme.

[1] This report has been prepared by Robert Fitzmaurice of CS Consulting Group. Robert holds an undergraduate degree in Civil & Environmental Engineering and Postgraduate qualifications in Industrial & Environmental Engineering and is a Chartered Engineer with Engineers Ireland.

13.2.2 Standards and Guidelines

The following legislation, standards and guidelines were consulted to inform the assessment:

- Guidelines on the information to be contained in Environmental Impact Statements, 2002, EPA;
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements), 2003, EPA;
- EPA: Draft Revised Guidelines on The Information to be Contained in Environmental Impact Assessment Reports, August 2017;
- EPA: Advice Notes for Preparing Environmental Impact Statements, Draft, September 2015;
- Irish Waters Code of Practice for Water Infrastructure;
- Irish Waters Code of Practice for Wastewater Infrastructure;
- Greater Dublin Strategic Drainage Study, (DCC 2005);
- Regional Code of Practice for Drainage Works, (DCC 2005);
- The Planning System & Flood Risk Management – Guidelines for Planning Authorities, Dept. of Environment, Heritage & Local Government. (Government of Ireland 2009).

13.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SITUATION)

13.3.1 Site Location and Context

The subject lands are located within the administrative jurisdiction of Dublin City Council. The site is located to the south Sheriff Street Upper, to the west of New Wapping St. to the north of Mayor St. and to the east of undeveloped land.

13.3.2 Existing Storm Water Infrastructure

Public storm water infrastructure in Dublin is under the administrative control of Dublin City Council. A review of the publicly available records does not indicate any dedicated storm water sewers in the region. Storm water drainage forming part of the combined drainage network for the area.

13.3.3 Existing Foul Water Infrastructure

All public foul & combined sewerage infrastructure are under the administrative control of Irish Water. A review of their records indicates a number of combined sewers in the vicinity of the subject lands. There is a 1000mm brick combined sewer draining from east to west along Sheriff Street Upper to the north of the subject lands, which turns north along East Wall Road and discharges into the Foul Pumping Station at East Wall Road. In addition there is also a 1000mm combined sewers located in New Wapping Street, which drains to the north and connects with the 1000mm combined sewer at the junction of Sheriff St & East Wall Road. Recent works by Dublin City Council & Irish Water to improve the local and regional waste water infrastructure led to the construction of a new regional waste water pumping station, which is located on the subject lands. A new interceptor sewer, 1200mm in diameter discharges into this

pumping station, the North Lotts Pumping Station (also known as the Spencer dock WWPS), from Sheriff Street Upper. The 1200mm diameter sewer is located to the west of the subject lands and enters the South Lott Pumping station on the subject lands. In addition there is a 525mm foul sewer draining from Mayor Street to the South also into the North Lotts Pumping station to the west of the subject lands. There are two number foul rising mains & a gravity overflow sewer from the North Lotts Pumping Station leaving the pumping station and turning south on New Wapping Street. Both the rising mains pass under the River Liffey in a utility tunnel before outfalling into the Ringsend Regional Waste Water Treatment Plant before final disposal. Refer to CS Consulting Drawing **R043/003** for details of same.

13.3.4 Existing Potable Water Infrastructure

As with the Foul/combined infrastructure potable water services are under the administrative control of Irish Water. A review of the available records indicates a 200mm Ductile Iron (2007) main to the north of the subject lands running along Sheriff Street Upper & a 300mm Ductile Iron (2006) main running along New Wapping Street to the east of the subject lands.

13.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The Block 2 proposed development occupies the corner of Sheriff Street Upper (to the north) and New Wapping Street (to the east), on the north side of the River Liffey. The plot measures approximately 1.26 hectares, with the DART Underground Reservation Strip running along its west side.

The proposed development site lies within the North Lotts and Grand Canal Strategic Development Zone (SDZ). The SDZ was designated in 2012 and a planning scheme for the zone was published by Dublin City Council in 2014. The 66-hectare SDZ extends north and south of the River Liffey, with the proposed development site falling within the northern sector, in a strategic location adjoining the National Convention Centre and the Red Luas Line.

The development comprises of an amendment to permitted development Reg. Ref. DSDZ2896/18 and as amended by Reg. Ref. DSDZ4279/18 at Spencer Place North, City Block 2, Spencer Dock, Dublin 1. The proposed development seeks revisions to the permitted Block 1 and 2 to provide for an increase in the number of residential units from 349 no. to 464 no. apartment units and the change of use of the permitted aparthotel development to Co-Living to provide for 84 no. co-living units. The proposed development will increase the height of the permitted development, increasing the maximum height of Block 1 from 7 no. storeys (27.5 m) to a maximum height of 13 no. storeys (46.8m) and increasing the maximum height of Block 2 (27.5m) to 11 no. storeys (40.5m). The proposed development will also include the provision of a link bridge between Block 1 and Block 2 at 6th floor level.

13.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

13.5.1 Stormwater Infrastructure

In accordance with the Greater Dublin Regional Code of Practice for Drainage Works, all sites are required to develop a drainage systems which separates storm & foul water on site. Should no separate storm water sewer be available to outfall into, then the foul & storm flows are combined at the site boundary with a ‘spur’ left should a future dedicated storm sewer become available.

In addition to improving overall storm water quality following Dublin City Council sustainable urban drainage systems, SuDs, protocols there is also a requirement to reduce storm water runoff rates to pre-development levels. To achieve this the scheme will provide internal stormwater attenuation tanks to provide the storm water

required for the predicated 1-in-100 year, increased by 20% for the predicated effects of climate change. A further requirement from Dublin City Council is to include for a 'tidal locking' storage. This is a requirement to ensure that should the outfall, into the River Liffey, is submerged that sufficient storage has been provided to ensure no onsite flooding occurs. The requirement is for an additional 570m^3/Ha to be provided. The proposed attenuation to be provided for the development has been cleated at 1940m^3. The proposed development will have two locations where it connects into the public combined system. As part of the development a new access road is to be constructed to the west of the site, to draining this road a new storm water sewer is to be installed.

The proposed restriction of storm water flows from the site during extreme weather events will increase the capacity of the existing infrastructure to convey storm flows.

13.5.2 Foul Infrastructure

All foul water infrastructure is under the control of Irish Water. The proposed development will be serviced by a new separate internal foul network for the proposed development. The proposed development will have two connection locations from the development to the existing 1000mm combined sewer located in New Wapping St.

As required by the SHD process Irish Water are required to review the schemes foul drainage proposal & to issue a letter of Design Acceptance, this has been received by the design team and is included as an appendix in the CS Consulting Engineering Service Report accompanying this submission.

The impact of the proposed development is that the capacity in the existing combined 1000mm sewer will be reduced.

13.5.3 Potable Water Infrastructure

All potable water infrastructure is under the control of Irish Water. The proposed development will be serviced by a new separate internal water network for the proposed development. The proposed development will have two connection locations from the development to the existing 300mm Ductile Iron watermain located in New Wapping St.

As required by the SHD process Irish Water are required to review the schemes potable water proposal & to issue a letter of Design Acceptance, this has been received by the design team and is included as an appendix in the CS Consulting Engineering Service Report accompanying this submission.

The impact of the proposed development is that the capacity in the existing watermain network will be reduced.

13.6 POTENTIAL CUMULATIVE IMPACTS

13.6.1 Stormwater Infrastructure

The cumulative impacts of the proposed development are that the local hydraulic pressure on the combined sewer will be reduced. The requirement to attenuate the subject site to pre-development run-off rates will ensure that during extreme storm events the surface from the development is limited, this will 'free up' capacity in the existing 1000mm combined sewer. The use of sustainable urban drainage features such as the proposed green roof, will aid in improving overall storm water quality prior to ultimate discharge.

13.6.2 Foul Infrastructure

The potential impacts on the local and regional foul drainage system are that the proposed development would reduce capacity in the adjoining 1000mm combined sewer and the capacity in the Regional Waste Water Treatment Plant at Ringsend. However, as the storm water outfalls into a combined sewer the provision of attenuating the storm water flow to 2l/sec/Ha will greatly reduce the volume of storm water entering the combined sewer during extreme storm events.

13.6.3 Potable Water Infrastructure

The potential impacts for the local public potable water are that the proposed development will reduce the capacity in the public main.

13.7 'DO NOTHING' IMPACT

In the "do-nothing" scenario the proposed site would not be redeveloped and therefore there would be no adverse impacts to the foul, stormwater & potable water system.

13.8 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

The proposed development is located within an area designated for the type of development proposed. As such the services pertaining to the development are required to facilitate the proposed scheme. It is not possible to not provide the services required. Notwithstanding this, the potable water, foul & stormwater services have all been designed in accordance with the requirements of the various stake holders, notable Irish Water for the foul & potable water utilities and Dublin City Council for the surface water services.

13.9 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

13.9.1 Stormwater Infrastructure

The predicated impacts are that the use of an attenuation system to restrict storm water flow from extreme storm events will aid in the freeing up of hydraulic capacity in the 1000mm combined sewer located in New Wapping Street during extreme storm water events. This is significant as combined sewers are designed to overflow into the River Liffey during extreme storm events, risking water quality issues within the Liffey. By reducing the storm water run-off during extreme storm events the enhanced increase in capacity in the 1000mm combined sewer will aid in preventing overflow discharges to the River Liffey. The use of green roof technology will also have the effect in removing polluting matter from the first flush of rainfall event, which will improve the overall storm water quality leaving the site.

13.9.2 Foul Infrastructure

The proposed development will reduce the overall capacity of the Regional Waste Water Treatment Plant at Ringsend. Notwithstanding, the Ringsend Plant is due for an up-grade to increase its overall hydraulic & qualitive capacity. It is the understanding of CS Consulting that these works will be completed prior to full occupation of the proposed development. The proposed effluent treatment requirement has been assessed by Irish Water and sufficient capacity in the local network is in place to facilitate the proposed development.

13.9.3 Potable Water

The proposed development will reduce the spare capacity in the local network, but as with the waste water requirement, Irish Water has assessed the requirement and have determined that sufficient capacity is in place and the proposed development can be accommodated.

13.10 MONITORING

All internal potable water & drainage services within the proposed building will be monitored by the management firm & their maintenance personnel will routinely inspect and carry out maintenance as required. The external potable water and foul effluent (and the combined outfall including restricted storm water flows) connections to the public system will be maintained by Irish Water.

13.11 REINSTATEMENT

As the proposed development will be a 'new build' there will be no reinstatement within the site boundary required. The external connections into the potable water and combined sewer will be carried out by Irish Waters regional contactor and reinstated to Dublin City Councils requirements.

13.12 INTERACTIONS

CS Consulting lodged *pre-connection enquiry* information to Irish Water, (copies of their response and design acceptance are appended to the Engineering Services Report). In addition consultations were held as part of the SHD system with Dublin City Council.

13.13 DIFFICULTIES ENCOUNTERED IN COMPILING

No difficulties were encountered while compiling this chapter.

Online Resources

www.water.ie
www.dublincity.ie
www.osimaps.ie

13.0 MATERIAL ASSETS – UTILITIES (PART B ELECTRICAL AND GAS SUPPLY)

13.1 DIFFICULTIES ENCOUNTERED IN COMPILING

This chapter of the Environmental Impact Assessment Report has been prepared by Aaron O Doherty, B.Eng(hons), MIRI, MCIBSE of Axis Engineering for Spencer Place Development Company Limited. This chapter provides an assessment of assets (electrical and gas) for a residential development at a brownfield site located at the junction of Sherriff Street Upper and New Wapping Street, Spencer Dock, Dublin 1.

The Block 2 proposed development occupies the corner of Sheriff Street Upper (to the north) and New Wapping Street (to the east), on the north side of the River Liffey. The plot measures approximately 1.26 hectares, with the DART Underground Reservation Strip running along its west side.

The objective of the chapter is to assess the impact of the proposed development on the receiving utilities environment and to propose mitigation measures if required.

13.2 STUDY METHODOLOGY

13.2.1 Desk Study

As part of our due diligence study of the site, we consulted with existing Utility providers including accessing their existing asset registers and site maps.

These included:

- ESB
- Gas Networks Ireland
- Telecoms providers

In addition, we've been familiar with the wider design team's studies, including:

- *Dublin City Development Plan 2016-2022*: The current Dublin City Development Plan was consulted for a list of protected structures, the Record of Protected Structure (RPS sites), comprising schedules of buildings and items of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest that are listed for protection in the study area;

- *North Lotts and Grand Canal Dock Planning Scheme, Dublin City Council 2014*: The North Lotts and Grand Canal Dock was designated as a Strategic Development Zone (SDZ) as part of the larger Master Plan of the Dublin Docklands Development Authority. The North Lotts and Grand Canal Dock Planning Scheme was created to facilitate and guide development in this area. The conservation of the Docklands' architectural heritage is a key component of the SDZ Planning Scheme.

13.2.2 Standards and Guidelines

The following legislation, standards and guidelines were consulted to inform the assessment:

All works described herein shall comply with:

- The Safety, Health and Welfare Act, 2005
- The Tender Drawings
- The Building Regulations 1998 & 2002
- The Main Contract Preliminaries
- The Materials and Workmanship Specifications
- All relevant Irish, British and European Standards and Codes of Practice
- The ECTI National Rules for Electrical Installations
- Building Control Regulations 2014

13.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SITUATION)

13.3.1 Site Location and Context

The subject lands are located within the administrative jurisdiction of Dublin City Council. The site is located to the south Sheriff Street Upper, to the west of New Wapping St. to the north of Mayor St. and to the east of undeveloped land.

13.3.2 Communication & IT Infrastructure

There are no existing electrical IT services on site that require diversionary works. IT infrastructure is available to the north of the site to service the proposed development.

13.3.3 Existing ESB Infrastructure

There are no existing electrical services on site that require diversionary works. Electrical infrastructure is available to the north, east and south of the site to service the proposed development.

13.3.4 Existing Natural Gas Infrastructure

There are no existing gas services on site that require diversionary works. Gas infrastructure is available to the south of the site to service the proposed development

13.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The Block 2 proposed development occupies the corner of Sheriff Street Upper (to the north) and New Wapping Street (to the east), on the north side of the River Liffey. The plot measures approximately 1.26 hectares, with the DART Underground Reservation Strip running along its west side.

The proposed development site lies within the North Lotts and Grand Canal Strategic Development Zone (SDZ). The SDZ was designated in 2012 and a planning scheme for the zone was published by Dublin City Council in 2014. The 66-hectare SDZ extends north and south of the River Liffey, with the proposed

development site falling within the northern sector, in a strategic location adjoining the National Convention Centre and the Red Luas Line.

The development comprises of an amendment to permitted development Reg. Ref. DSDZ2896/18 and as amended by Reg. Ref. DSDZ4279/18 at Spencer Place North, City Block 2, Spencer Dock, Dublin 1. The proposed development seeks revisions to the permitted Block 1 and 2 to provide for an increase in the number of residential units from 349 no. to 464 no. apartment units and the change of use of the permitted aparthotel development to Co-Living to provide for 84 no. co-living units. The proposed development will increase the height of the permitted development, increasing the maximum height of Block 1 from 7 no. storeys (27.5 m) to a maximum height of 13 no. storeys (46.8m) and increasing the maximum height of Block 2 (27.5m) to 13 no. storeys (40.5m). The proposed development will also include the provision of a link bridge between Block 1 and Block 2 at 6th floor level.

13.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

13.5.1 COMMUNICATION AND IT SERVICES

4 no. new incoming fibre connection cables and 4 no. incoming multi-core copper cables shall be brought in from the perimeter via in-ground ducting and terminated on a frame by the utility provider.

Incoming services shall be terminated in centralised comms rooms and distributed throughout the blocks accordingly.

For further details, refer to Axiseng layout drawing SPN3-AXE-ZZ-ZZ-DR-E-60101 Site Services Layout.

13.5.2 ESB

New ESB sub-stations will be constructed located at ground floor level as per and in accordance with ESB requirements.

For further details, refer to Axiseng layout drawing SPN3-AXE-ZZ-ZZ-DR-E-60101 Site Services Layout.

13.5.3 GAS

New incoming natural gas services provided to the shared accommodation block.
Incoming services shall be terminated at a new gas meter skid within the basement.

For further details, refer to Axiseng layout drawing SPN3-AXE-ZZ-ZZ-DR-E-60101 Site Services Layout and Sustainability / Energy & Carbon Reports.

13.7 'DO NOTHING' IMPACT

In the "do-nothing" scenario the proposed site would not be redeveloped and therefore there would be no adverse impacts to the existing utilities.

13.8 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

The proposed development is located within an area designated for the type of development proposed. As such the services pertaining to the development are required to facilitate the proposed scheme. It is not possible to not provide the services required. Notwithstanding this, the gas, electricity and telecomms services have all been designed in accordance with the requirements of the various stake holders.

13.9 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

Utility providers are to complete 'tie-in' to their existing assets, whilst maintaining business continuity to the surrounding area.

13.10 MONITORING

Monitoring will be provided for by each Utility company with an over-seeing responsibly by the Main Contractor during construction phase.

13.11 REINSTATEMENT

As the proposed development will be a 'new build' there will be no reinstatement within the site boundary required.

13.12 INTERACTIONS

Axiseng have consulted with ESB, Gas Network Ireland and telecoms providers to ensure that connections are feasible an no diversionary works are required.

13.13 DIFFICULTIES ENCOUNTERED IN COMPILING

No difficulties were encountered while compiling this chapter.

Chapter 14:

Interactions Between Environmental Factors

14.0 INTERACTIONS BETWEEN ENVIRONMENTAL FACTORS

14.1 INTRODUCTION

All environmental factors are interlinked to a degree such that interrelationships exist on numerous levels. Interactions within the study area can be one-way interactions, two-way interactions and multiple-phase interactions which can be influenced by the proposed development. As this EIAR document has been prepared by a number of specialist consultants an important aspect of the EIA process is to ensure that interactions between the various disciplines have been taken into consideration. This chapter of the EIAR was prepared by Mary MacMahon , BA, MRUP, MIPI, Associate Director with John Spain Associates.

The purpose of this requirement of an EIAR is to draw attention to significant interaction and interrelationships in the existing environment. ***John Spain Associates, Planning & Development Consultants*****,** in preparing and co-ordinating this EIAR ensured that each of the specialist consultants liaised with each other on an ongoing and regular basis and dealt with the likely interactions between effects predicted as a result of the proposed development during the preparation of the proposals for the proposed development and ensuring that appropriate mitigation measures are incorporated into the design process.

Having regard to the above, JSA required from the outset that a specific section on Interactions is included in each of the environmental topic chapters of the EIAR. This approach is considered to meet with the requirements of Part X of the Planning and Development Act 2000, as amended, and Part 10, and Schedules 5, 6 and 7 of the Planning and Development Regulations 2001-2018.

Having regard to the approach taken, the aspects of the environment likely to be significantly affected by the proposed development, during both the construction and operational phases, have been considered in detail in the relevant Chapters of this EIAR document. In addition, the interactions between one topic and another have been discussed under each topic Chapter by the relevant specialist consultant.

The primary interactions can be summarised as follows:

- Architectural design, landscape design, and road and services design with visual impact and material assets;
- Landscape design and engineering services with biodiversity and archaeology;
- Stormwater attenuation design with biodiversity and land and soils ;
- Visual impact with biodiversity and architectural heritage and archaeology;
- Biodiversity with water and soils;
- Architectural and landscape design with noise;
- Noise and vibration and population and human health;
- Air quality and climate and Population and Human Health;
- Material Assets with Population and Human Health, Water, Noise and Vibration, Air Quality and Climate

The relevant consultants liaised with each other and the project architects, engineers and landscape architects where necessary to review the proposed scheme and incorporate suitable mitigation measures where necessary. As demonstrated throughout this EIAR, most inter-relationships are neutral in impact when the mitigation measures proposed are incorporated into the design, construction or operation of the proposed development.

In addition to the above a series of standalone reports have been prepared to accompany the application and which have helped inform the final scheme design and the relevant chapters of the EIAR. Cronin Sutton Consulting Engineers have prepared a Traffic and Transport Assessment Report. Cronin Sutton Consulting Engineers have prepared a Site Specific Flood Risk Assessment for the site. Cronin Sutton Consulting Engineers have undertaken

site investigations and soil testing, which have informed the stormwater drainage proposals and design. AWN Consulting and Hegarty's Construction have produced a Construction and Operational Waste Management Plan. In addition, Altemar has prepared an Appropriate Assessment Screening Report which concludes that the scheme will not have any likely significant impact either alone or in combination with other plans of projects on any European Site.

Table 14.1 – Summary of Interactions

Interaction	Population & Human Health		Biodiversity		Land & Soils		Air & Climate		Noise & Vibration		Water		Archaeology, Architecture & Cultural Heritage		Landscape and Visual Impact		Material Assets: Traffic, Waste, & Utilities	
	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Population & Human Health					✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓
Biodiversity					✓						✓	✓						
Land & Soils											✓						✓	
Air & Climate																	✓	✓
Noise & Vibration																	✓	✓
Water																		
Archaeology, Architecture & Cultural Heritage																		
Landscape																		
Material Assets: Traffic, Waste, & Utilities																		

✓ Interaction
✗ No Interaction

Chapter 15:

Summary of EIA Mitigation and Monitoring Measures

15.0 Summary of EIA Mitigation & Monitoring Measures

15.1 Introduction

The central purpose of EIA is to identify potentially significant adverse impacts at the pre-consent stage and to propose measures to mitigate or ameliorate such impacts. This chapter of the EIAR document has been prepared by John Spain Associates and sets out a summary of the range of methods described within the individual chapters of this EIAR document which are proposed as mitigation and for monitoring during the construction and operational phases of the proposed development. It is intended that this chapter of the EIAR document will provide a useful and convenient summary to the competent/consent authority of the range of mitigation and monitoring measures proposed.

EIA related conditions are normally imposed by the competent/consent authority as part of conditions of planning consent and form a key part of the Impact Anticipation and Avoidance strategy. Conditions are principally used to ensure that undertakings to mitigate are secured by explicitly stating the location, quality, character, duration and timing of the measures to be implemented. A secondary role of EIA related conditions is to ensure that resources e.g. bonds / insurances will be available and properly directed for mitigation, monitoring or remedial action, in the event that the impacts exceed the predicted levels.

Monitoring of the effectiveness of mitigation measures put forward in the EIAR document, both by the competent authorities and the developer, is also an integral part of the process. Monitoring of environmental media and indicators arise either from undertakings or from conditions.

In the case of mitigation and monitoring measures it is important for all parties to be aware of the administrative, technical, legal and financial burdens that can accompany the measures proposed. It is also important to ensure that, where monitoring is provided for, it is clearly related to thresholds, which if exceeded cause a clearly defined set of actions to be implemented.

The 2018 EIA Guidelines published by the Department of Housing, Planning and Local Government state:

“While not a mandatory requirement an EIAR can very usefully include a summary table of features and/or measures envisaged to avoid, prevent or reduce and, if possible, offset likely significant adverse effects of the proposed development, and a timescale for the implementation of proposed mitigation measures.”

Given the complexity of the scheme in question, and the detail provided within this EIAR, this chapter seeks to provide a complete overview of mitigation and monitoring measures proposed, in the spirit of the above statement within the EIA Guidelines albeit not formatted as a table.

15.2 Mitigation Strategies

15.2.1 Introduction

There are three established strategies for impact mitigation - avoidance, reduction and remedy. The efficacy of each is directly dependent on the stage in the design process at which environmental considerations are taken into account (i.e. impact avoidance can only be considered at the earliest stage, while remedy may be the only option available to fully designed projects).

15.2.2 Mitigation by Avoidance

Avoidance is generally the fastest, cheapest and most effective form of impact mitigation. Environmental effects and consideration of alternatives have been taken into account at the earliest stage in the project design processes. The consideration of alternatives with respect to the development of the subject lands has been described in Chapter 2.

15.2.3 Mitigation by Reduction

This is a common strategy for dealing with effects which cannot be avoided. It concentrates on the emissions and effects and seeks to limit the exposure of the receptor. It is generally regarded as the "end of pipe" approach because it does not seek to affect the source of the problems (as do avoidance strategies above). As such this is regarded as a less sustainable, though still effective, approach.

15.2.4 Reducing the Effect

This strategy seeks to intercept emissions, effects and wastes before they enter the environment. It monitors and controls them so that acceptable standards are not exceeded. Examples include wastewater treatment, filtration of air emissions and noise attenuation measures.

15.2.5 Reducing Exposure to the Impact

This strategy is used for impacts which occur over an extensive and undefined area. Such impacts may include noise, visual impacts or exposure to hazard. The mitigation is effected by installing barriers between the location(s) of likely receptors and source of the impact (e.g. sound barriers, tree screens or security fences).

15.2.6 Mitigation by Remedy

This is a strategy used for dealing with residual impacts which cannot be prevented from entering the environment and causing adverse effects. Remedy serves to improve adverse conditions which exist by carrying out further works which seek to restore the environment to an approximation of its previous condition or a new equilibrium.

15.3.0 Mitigation and Monitoring Measures

The following provides a list, for ease of reference, of the mitigation and monitoring measures recommended in each chapter of the EIAR.

15.3.1 Project Description & Alternatives Examined

Construction Phase

PD&AE CONST 1: It will be necessary for the appointed contractor to prepare and implement a construction management plan (including traffic management) to reduce the impacts of the construction phase on local residents and ensure the local road network is not adversely affected during the course of the construction project.

PD&AE CONST 2: The appointed contractor should prepare a Construction and Operational Waste Management Plan for the proposed development as part of their contractual responsibilities. The Waste Management Plan should meet the requirements of the Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects.

Operational Phase

Not applicable.

Monitoring

Not applicable.

15.3.2 Population and Human Health

Construction Phase

POP & HH CONST 1: In order to protect the amenities enjoyed by nearby residents, premises and employees a Construction Management Plan (including traffic management) should be prepared by the contractor and implemented during the construction phase.

Operational Phase

Not applicable.

Monitoring

In relation to the impact of the development on population and human health it is considered that the monitoring measures outlined in regards to the other environmental topics such as water, air quality and climate and noise etc. sufficiently address monitoring requirements.

15.3.3 Archaeological, Architectural and Cultural Heritage

The groundworks phase of works (bulk excavations) is currently being carried out as part of the permitted development (Reg. Ref. DSDZ4279/18). The works commenced in December 2018 and are expected to be finished by the end of July 2019. All of the groundworks have been monitored by an archaeologist (Rubicon Heritage Ltd) under licence number 18E0761, issued by the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht (a copy of the method statement was also forwarded to the Dublin City Archaeologist). To date, no features of archaeological significance have been encountered (Jean O'Dowd & James Hession, Rubicon Heritage Ltd, pers. comm.). Archaeological monitoring is ongoing and will continue until the completion of the groundworks.

No additional mitigation is required.

Monitoring

Post development monitoring is not applicable in terms of the archaeological, architectural or cultural heritage

15.3.5 Biodiversity (Flora & Fauna)

Construction Phase

FF CONST 1: Mitigation to protect nesting birds.

No vegetation should be cleared during the bird nesting season, which can be assumed to last from March to July inclusive. Where this is not possible, vegetation must first be inspected by a suitably qualified ecologist. Where no nesting is observed, vegetation can be removed within 48 hours. Where there is nesting, this can only be disturbed under licence from the NPWS.

Operational Phase

There are no mitigation measures for the operational phase of the development.

Monitoring

Monitoring is required where the success of mitigation measures is uncertain or where residual impacts may in themselves be significant.

No further monitoring is required.

15.3.6 Landscape and Visual Impact

Construction and Operational Phase

The proposed development takes account of the physical context and the policy for development of the area. The potential impacts on the townscape and visual amenity are all positive. Therefore no measures to avoid, reduce or mitigate negative impacts have been identified.

Monitoring

There is no monitoring required as part of the landscape and visual impact assessment of the development.

15.3.7 Land and Soils

Construction Phase

L&S CONST 1:

- Top-soiling and landscaping of the works should take place as soon as finished levels are achieved, in order to reduce weathering and erosion and to retain soil properties.
- The provision of wheel wash facilities close to the site entrance to reduce the deposition of mud, soils and other substances on the surrounding road network.
- The construction phase should be monitored, in particular in relation to the following;
  - Adequate protection from contamination of soils for removal;
  - Cleanliness of adjoining road network;
  - Prevention of oil and petrol spillages;
  - Dust control.
- Where feasible, the extent of excavation works and depths for buildings and roads should be limited through design to minimize disturbance of the original soil and subsoil formations and to retain soil structure. This will also help to reduce the volumes of backfill and material to be removed off-site.
- Reusable excavated gravels, sands or rock should be retained on-site for backfilling or drainage purposes to reduce the total volume of imported material. Rock should be retained on site where feasible.
- Should material appear to be contaminated, soil samples should be analysed by an appropriate testing laboratory. Contaminated material should be treated in accordance with the Waste Management Regulations, 1998.
- Excess fill, unsuitable material and suitable material will be removed off-site. Removal should be in accordance with the relevant Waste Management Regulations

- Oil and fuel stored on site should be stored in designated areas. These areas shall be bunded and should be located away from surface water drainage.
- Refueling of construction machinery shall be undertaken in designated areas located away from surface water drainage. Spill kits shall be kept in these areas in the event of spillages.
- Hazardous waste shall be dealt with in accordance with the Waste Management (Hazardous
- Waste) Regulations, 1998.
- All potentially hazardous materials shall be securely stored on site.

Operational

L&S OPERAT 1: The surface water run-off from the development should be collected by an appropriately designed system. This system should ensure that contaminants are removed prior to discharge e.g. via a light liquids separator or by an appropriate treatment train of Sustainable Urban Drainage Systems as outlined in the Greater Dublin Strategic Drainage Study (GDSDS). Any separators and drainage systems should be maintained and operated by the facilities management company (prior to taking in charge by the Local Authority) in accordance with the manufacturers
recommendations.

L&S OPERAT 2: All waste generated by the everyday operation of the development should be securely stored within designated collection areas. These should have positive drainage collection systems to collect potential run off. Operational waste should be removed from site using licensed waste management contractors.

Monitoring

A monitoring system will be in place during the excavation works to track the transportation and disposal pathway of waste material generated during the excavation of the basement

15.3.8 Water

15.3.8.1 Surface Water

Construction Phase

Surface Water Construction Stage Measures to be Implemented:

- A method statement for all works to be carried out will be prepared by the contractor and agreed with Dublin City County Council prior to commencement of works to outline what measures are to be taken to ensure there is no loss of service during the works;
- Dewatering measures should only be employed where necessary;
- If concrete mixing is carried out on site, the mixing plant should be sited in a designated area with an impervious surface;
- Existing surface drainage channels within the lands that serve adjacent lands should be retained where possible to prevent causing increased flooding impacts;
- Construction methods used should be tailored to reduce, as much as possible, dust and noise pollution;
- Comprehensive traffic management procedures, including the provision of access to all roads, and access/egress points should be prepared and agreed with the Local Authority. These traffic management measures should be implemented at times when traffic disruption may be experienced;
- Road sweeping and/or wheel wash facilities should be provided, as required;
- All oils/diesel stored on site for construction equipment are to be located in appropriately bunded areas;
- Filters and silt traps will be used to prevent rain washing silts and other materials into the surface water network and creating blockages.
- Watercourses/groundwater need to be protected from sedimentation and erosion due to direct surface water runoff generated onsite during the construction phase. To prevent this from occurring surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete.

Operational

Surface Water Operational Stage Measures to be Implemented:

- Water Quality: SuDs measures outlined in Section 8.4.3 will reduce quantities and improve the quality of surface water run-off from the site.

Foul Water Drainage

Construction Phase

Foul Water Drainage Construction Stage Measures to be Implemented:

- Road sweeping and/or wheel wash facilities should be provided, as required;
- All onsite sewers should be tested and surveyed prior to connection to the public sewer to prevent any possibility of ingress of ground water;
- All sewers will be inspected and where necessary sealed to ensure that uncontrolled ground water inflow does not occur;
- Any leakage from the foul sewer will be cordoned off and the contaminated effluent and soil collected and disposed by licensed contractors.

Operational

Foul Water Drainage Operational Stage Measures to be Implemented:

- Dual & low flush toilets will be used to reduce flows from the development.
- In order to reduce the risk of defective or leaking sewers, all new sewers should be laid in accordance with the relevant standards, pressure tested and CCTV surveyed to ascertain any possible defects.

15.3.9 Water Supply

Construction Phase

Water Supply Construction Stage Measures to be Implemented:

- Contact the local authority to adhere to the measures required for introducing a new watermain connection.
- Testing of the system meter & telemetry system is required.

Operational

Water Supply Operational Stage Measures to be Implemented:

- The site water main system will be metered as directed by the Council to facilitate detection of leakage and the prevention of water loss.
- Dual & low flush toilets and water economy outlets will all be considered to reduce the water demand.

Monitoring

All surface water drainage works will be approved by Dublin City County Council, Drainage Division, and will be carried out in accordance with the GDRCOP (Greater Dublin Regional Code of Practice for Drainage Works). Foul and water works will be carried out in accordance with Irish Water Codes of Practice.

15.3.10 Air Quality & Climate

Construction Phase

AQ CONST 1: Air Quality Mitigation Measures
The dust minimisation measures specified in Appendix 9.2 of this chapter will be implemented during the construction phase of the project and thus fugitive emissions of dust from the site will be insignificant and pose no nuisance at nearby receptors.

Climate

CO2 and N2O emissions during construction will have a negligible impact on climate therefore no mitigation measures are required.

Operational

The impact of the proposed development on air quality and climate will be imperceptible. Thus, no site-specific mitigation measures are required.

Monitoring

In order to ensure that any dust nuisance is minimised, a series of mitigation measures have been listed in Appendix 9.2. If the construction contractor adheres to good working practices and implements dust mitigation measures the levels of dust generated are assessed to be minimal and are unlikely to cause an environmental nuisance.

15.3.11 Noise & Vibration

Construction Phase

With regard to construction activities, best practice operational and control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) Parts 1 and 2.

BS 5228 includes guidance on several aspects of construction site practices, including, but not limited to:

liaison with the Public;
noise monitoring;
selection of quiet plant;
control of noise sources, and;
screening (boundary, and or localised plant screening).

Detailed comment is offered on these items in the following paragraphs. Noise control measures that will be considered include liaison with the public, noise monitoring, the selection of quiet plant, enclosures and screens around noise sources and limiting the hours of work.

Liaison with the Public

The Contractor will provide proactive community relations and will notify the public and sensitive premises before the commencement of any works forecast to generate appreciable levels of noise or vibration, explaining the nature and duration of the works. The Contractor will distribute information circulars informing people of the progress of works and any likely periods of significant noise and vibration.

A designated noise liaison should be appointed to site during construction works. Any complaints should be logged and followed up in a prompt fashion. In addition, prior to particularly noisy construction activity, e.g. rock breaking, piling, etc., the site contact should inform the nearest noise sensitive locations of the time and expected duration of the works. It is understood that such operations are implemented to date in relation to the site in terms of recent construction works and in relation to day to day activities associated with existing site operations. These measures will be continued during the construction phase of the proposals considered in this assessment.

Noise Monitoring

During the construction phase consideration should be given to noise monitoring at the nearest sensitive locations. Again, as part of current site management a number of permanent noise monitors are managed and maintained in order to monitor noise emissions from the site. This practice will be continued as part of the proposed construction works associated with the development works under consideration here.

Noise monitoring is and will be conducted in general accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.

Selection of Quiet Plant

This practice is recommended in relation to sites with static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures where possible. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.
Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration should be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

BS5228 states that "as far as reasonably practicable sources of significant noise should be enclosed". In applying this guidance, constraints such as mobility, ventilation, access and safety must be taken into account. Items suitable for enclosure include pumps and generators. Demountable enclosures will also be used to screen operatives using hand tools and will be moved around site as necessary.

BS5228 makes a number of recommendations in relation to "use and siting of equipment". These recommendations will be adopted on site.

"Plant should always be used in accordance with manufacturers' instructions. Care should be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading should also be carried out away from such areas. Special care will be necessary when work has to be carried out at night.

Circumstances can arise when night-time working is unavoidable. Bearing in mind the special constraints under which such work has to be carried out, steps should be taken to minimise disturbance to occupants of nearby premises.

Machines such as cranes that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. Machines should not be left running unnecessarily, as this can be noisy and waste energy.

Acoustic covers to engines should be kept closed when the engines are in use and idling. The use of compressors that have effective acoustic enclosures and are designed to operate when their access panels are closed is recommended.

Materials should be lowered whenever practicable and should not be dropped. The surfaces on to which the materials are being moved could be covered by resilient material."

All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

Screening

Screening is typically an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen and its position relative to both the source and receiver.

The length of the screen should in practice be at least five times the height; however, if shorter sections are necessary then the ends of the screen should be bent around the source. The height of any screen should be such that there is no direct line of sight between the source and the receiver. For critical areas in close proximity to the works where other forms of noise control measures do not sufficiently reduce noise levels below the significant criteria, a standard 2.4m high hoarding is recommended around the site perimeter.

BS 5228 states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the barrier should be such that there are no gaps or openings at joints in the screen

material. In most practical situations the effectiveness of the screen is limited by the sound transmission over the top of the barrier rather than the transmission through the barrier itself. In practice screens constructed of materials with a mass per unit of surface area greater than 7 kg/m2 will give adequate sound insulation performance.

In addition, careful planning of the site layout should also be considered. The placement of site buildings such as offices and stores and in some instances materials such as topsoil or aggregate can provide a degree of noise screening if placed between the source and the receiver.

The use of mobile localised screens should also be considered for use around items of high noise levels. Mobile screens also have the benefit of placing the screen close to the source in addition to screening the plant item of concern from the closest noise sensitive locations, depending on its location on site.

Operational Phase

Outward Impact

Car Parking on the Site

The noise impact assessment outlined above has demonstrated that mitigation measures are not required.

Additional Vehicular Traffic on Public Roads

The noise impact assessment outlined in this chapter has demonstrated that mitigation measures are not required.

Mechanical and Electrical Plant

A design goal has been set for building services plant at the nearest noise sensitive locations in order to avoid any significant increase to the existing noise environment. In order to achieve the design goal, best practice control measures will be adopted during the detailed design stage. This will typically involve the following forms of noise control techniques:-

selection of plant with low noise and vibration emissions;
provision of solid barriers or acoustic louvered panels screening external plant;
installation of duct mounted attenuators on the atmosphere side of air moving plant;
installation of splitter attenuators or acoustic louvres providing free ventilation to internal plant areas, and;
anti-vibration mounts on reciprocating plant.

Inward Impact

Inward Noise Impact from Existing Road and Luas Movements

The assessment detailed in Appendix 10.1 has identified two façade specifications for the development. The two façade areas are marked up in Figure 10.2. The area marked-up as Type 1 Façade requires a slightly increased sound insulation performance achieved in this instance by incorporating enhanced glazing.

Noise Emissions for the Spencer Dock Pumping Station

The noise impact assessment outlined in this chapter has demonstrated that mitigation measures are not required.

Noise Transfer Internally between Amenity Spaces and Residential Spaces

The noise impact assessment outlined in this chapter has demonstrated that mitigation measures are not required.

Noise Impact from New Mechanical and Electrical Plant

The noise impact assessment outlined in this chapter has demonstrated that mitigation measures are not required.

Monitoring

Construction Phase

During the construction phase noise monitoring will be conducted in accordance with the International Standard ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise and survey locations should be located a distance of greater than 3.5m away from any reflective surfaces, e.g. walls, in order to ensure a free-field measurement without any influence from reflected noise sources

Operational Phase

Noise or vibration monitoring is not required once the development is operational.

15.3.12 Material Assets Traffic and Transport & Utilities

Traffic

Construction Phase

As described in the accompanying Traffic Impact Assessment report, the development shall incorporate several design elements intended to mitigate the impact of the development on the operation of the surrounding road network. These include:
a reduced car parking provision, which shall discourage higher vehicle ownership rates and excessive vehicular trips to the development (by residents and visitors); and
a high provision of secure bicycle parking, which shall serve to encourage bicycle journeys by both residents and visitors.

As described in the accompanying Mobility Management Plan (MMP) Framework document, the development site is situated in proximity to existing high-quality bus, rail and light rail services through Dublin City, as well as proposed future transport infrastructure. The site benefits from a location close to numerous amenities and centres of employment and is within approximately 20 minutes' walk of O'Connell Bridge, at the heart of the city centre.

As also described in the MMP Framework, a Mobility Manager shall be appointed for the proposed development, with the remit to implement and oversee an ongoing Mobility Management Plan (MMP). This shall assist residents and their visitors in making the most of sustainable transport opportunities and in avoiding single-occupant car journeys.

Monitoring

As described in the accompanying MMP Framework document, a Mobility Manager shall be appointed for the proposed development, with the remit to implement and oversee an ongoing Mobility Management Plan (MMP). In conjunction with this, the Mobility Manager shall be responsible for monitoring the travel habits of residents of and visitors to the development.

Waste

Construction Phase

The following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that the following waste types, at a minimum, will be segregated:
- Concrete rubble (including ceramics, tiles and bricks);
- Plasterboard;

- Metals;
- Glass; and
- Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Operational Phase

In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
- Organic waste;
- Dry Mixed Recyclables;
- Mixed Non-Recyclable waste
- Waste electrical and electronic equipment (WEEE);
- Batteries (non-hazardous and hazardous);
- Cooking oil;
- Light bulbs;
- Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
- Furniture (and from time to time other bulky waste); and

All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;

All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available; and

All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

Monitoring

The management of waste during the construction phase should be monitored to ensure compliance with relevant local authority requirements, and effective implementation of the WMS D&C including maintenance of waste documentation.

The management of waste during the operational phase should be monitored to ensure effective implementation of the OWMP by the building management company and the nominated waste.

Drainage and Water Supply

Mitigation Measures

The proposed development is located within an area designated for the type of development proposed. As such the services pertaining to the development are required to facilitate the proposed scheme. It is not possible to not provide the services required. Notwithstanding this, the potable water, foul & stormwater services have all been

designed in accordance with the requirements of the various stake holders, notable Irish Water for the foul & potable water utilities and Dublin City Council for the surface water services.

Monitoring

All internal potable water & drainage services within the proposed building will be monitored by the management firm & their maintenance personnel will routinely inspect and carry out maintenance as required. The external potable water and foul effluent (and the combined outfall including restricted storm water flows) connections to the public system will be maintained by Irish Water.

Eclectic and Gas

Mitigation Measures

The proposed development is located within an area designated for the type of development proposed. As such the services pertaining to the development are required to facilitate the proposed scheme. It is not possible to not provide the services required. Notwithstanding this, the gas, electricity and telecomms services have all been designed in accordance with the requirements of the various stake holders.

Monitoring

Monitoring will be provided for by each Utility company with an over-seeing responsibly by the Main Contractor during construction phase.

Chapter 16:

Risk Management

16.0 RISK MANAGEMENT

16.1 INTRODUCTION

The 2014 EIA Directive (2014/52/EU) has updated the list of topics to be addressed in an EIAR and has included 'Risk Management' as a new chapter to be addressed. Article 3 of the new EIA Directive requires that the EIA shall identify, describe and assess in the appropriate manner, the direct and indirect significant effects on population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage, and landscape deriving from (amongst other things) the "vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned".

The chapter identifies and assesses the likelihood and potential significant adverse impacts on the environment arising from the vulnerability of the proposed development to risks of major accidents and / or natural disasters. It considers whether the proposed development is likely to cause accidents and / or disasters and its vulnerability to them. This chapter of the EIAR was prepared by Mary Mac Mahon, Executive Director at John Spain Associates, Planning & Development Consultants. This chapter was also reviewed by the contractors on site, PJ Hegarty's, who prepared the Construction Management Plan and CS Consulting Engineers.

The purpose of the chapter is to ensure that the safety and precautionary measures necessary to protect the proposed development in the event of a major accident and / or natural disaster are identified and that appropriate mitigation measures are provided that would protect the environment in the event of such occurrences.

This chapter will identify the types of major accidents / natural disasters that the project is vulnerable to; whether major accidents or natural disasters and the responses to these give rise to significant adverse environmental impacts; the nature of these impacts and the measures needed to prevent or mitigate the likely adverse impact of such events on the environment.

16.2 STUDY METHODOLOGY

The starting point for the scope and methodology of this assessment is that the proposed development has been designed and will be constructed in line with best practice and, as such, major accidents and / or natural disasters will be very unlikely. The identification, control, and management of risk is an integral part of the design and assessment process throughout all stages of a project lifecycle. For example, a Flood Risk Assessment was carried out. Measures to control risks associated with Construction Phase activities are incorporated into the Construction Environmental Management Plan.

The following sections set out the requirements as stated in the new EIA Directive and in the EPA draft Guidelines on the information to be contained in an Environmental Impact Assessment Report (EIAR). The scope and methodology presented is based on the new EIA Directive, the draft EPA guidelines, on other published risk assessment and on professional judgement of the consultants with this responsibility in the construction and operation of the proposed development. A risk analysis-based approach methodology which covers the identification, likelihood and consequence of major accidents and / or natural disasters has been used for the assessment. This type of risk assessment approach is an accepted methodology.

Recital (15) of the EIA Directive states that:

> *In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment. For such projects, it is important to consider their vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment. In order to avoid duplications, it should be possible to use any relevant information available and obtained through risk assessments carried out pursuant to Union legislation, such as Directive 2012/18/EU of the European Parliament and the Council1 and Council Directive 2009/71/Euratom2, or through relevant assessments carried out pursuant to national legislation provided that the requirements of this Directive are met.*

The intent of the directive is that a major accident and/or natural disaster assessment should be mainly applied to COMAH (Control of Major Accident Hazards involving Dangerous Substances) sites or nuclear installations. The proposed development in this instance is an urban regeneration project which when completed, will not give rise to ongoing significant risks in its operating environment.

The *2017 EPA Draft Guidelines* on the information to be contained in an EIAR refer to major accidents and/or disasters in a number of sections:

Characteristics of the Project – the draft guidelines state that the project characteristics should "a description of the Risk of Accidents – having regard to substances or technologies used."

Impact assessment - the draft guidelines state that the impact assessment should include "the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)".

Likelihood of Impacts - the draft guidelines state the following:

> "*To address unforeseen or unplanned effects the Directive further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other regulations e.g. a COMAH assessment*."

There are also a number of mechanisms which currently manage accidents outside of the EIA process. These would include through the Construction Management Plan, which would deal with pollution risks during construction (See Chapters 7 and 9 on Land, Soils, Air and Water) and risk of accidents during construction, including traffic accidents. The risk of flooding is dealt with in Chapter 8; Water. There is no risk of flooding. Separately, the risk of fire is managed through the Fire Safety Certification process, which is an integral part of the design of the proposed development.

16.3 SITE SPECIFIC RISK ASSESSMENT METHODOLOGY

This section identifies the potential of unplanned but potential events that could occur during construction and operation of the proposed development.

Risks are set out according to the classification of risk, taken from the Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage & Local Government, 2010).

Figure 16.1 Classification of Likelihood Extract (Department of the Environment, Heritage & Local Government, 2010).

Table 2 - Classification of Likelihood

Ranking	Classification	Likelihood
1	Extremely Unlikely	May occur only in exceptional circumstances; Once every 500 or more years
2	Very Unlikely	Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities or communicates; and / or little opportunity, reason or means to occur; May occur once every 100-500 years.
3	Unlikely	May occur at some time; and /or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisations worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years.
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years
5	Very Likely	Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year.

Hazard identification

The site is not in an area prone to natural disasters. Risks were reviewed through the identification of plausible risks in consultation with relevant specialists. Therefore the risks set out below are considered the most relevant potential risks.

Table 16.1 : Identification of Risks

Category	Risk Factor Type	Likelihood
Weather	Storms, snow	5
Hydrological	Risk from flooding	1
Geological	Made ground	3
Road	Traffic accident	3
Industrial accident	Seveso site	3
Explosion	Natural gas	1
Fire	Construction and operation	3
Building Collapse	Structural failure	2
Hazardous substance escape	Construction	3
Pollution	Construction	3

Disruption to 3rd party output	Electrical (Irish Water / Luas)	2
Archaeology	Demolition	1

The risks are then tested in terms of consequences. It should be noted that when categorising the Consequence Rating, the rating assigned assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster. In addition, Dublin City Council have in place a 'Major Emergency Plan' which, if implemented as intended, will work to reduce the effect of any major accident or disaster.

The impact ratings are taken from the Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage & Local Government, 2010).

A risk matrix can be prepared against which the proposed development can be tested.

Figure 16.2 Risk Matrix Extract (Department of the Environment, Heritage & Local Government, 2010).

Likelihood Rating							
	Very likely	5					
	Likely	4					
	Unlikely	3					
	Very unlikely	2					
	Extremely Unlikely	1					
			Minor	Limited	Serious	Very Serious	Catastrophic
			1	2	3	4	5
			Consequence Rating				

16.4 THE PROPOSED DEVELOPMENT

16.4.1 LIKELY SIGNIFICANT EFFECTS

16.4.1.1 Do Nothing Scenario

In the do-nothing scenario, the potential risk of the proposed development would be similar due to the ongoing works under Reg. Ref. DSDZ2896/18 and DSDZ4279/18.

16.4.1.2 CONSTRUCTION PHASE

The proposed development will involve the excavation of a basement, traffic management, scaffolding.

Hazardous materials used during construction will be appropriately stored so as not to give rise to a risk of pollution.

In the event of storms or snow, construction activity can be halted and the site secured. The construction activity will involve a number of potential risks as set out in the construction management plan. The risks identified include traffic management, working at height, and fire strategy.

16.4.2 OPERATION PHASE

The proposed development is a mixed use development. The residential component will comprise of 464 no. residential units with associated resident support facilities and resident services and amenities and 84 no. shared accommodation units, (200 no. bedspaces).

The main risk identified during operation is the risk of fire, the potential impact of the site accidents and impact on the Luas line and Irish Water pumping station.

With regard to fire the proposed uses are considered normal hazard fire risks as would be encountered in most developments and do not include any hazards which would be regarded as presenting an exceptional environmental fire hazard.

The fire risk mitigation for the project will comprise all fire safety measures necessary to comply with the requirements of Part B (Fire) of the Second Schedule to the Building Regulations 1997-2017. It is noted that these measures will be validated under the Building Control Act 1990-2007 through the obtaining, in due course, of statutory Fire Safety Certificates under Part III of the Building Control Regulations 1997-2018 from Dublin City Council/Dublin Fire Brigade.

The cleaning of windows in the buildings will be undertaken by specialist contractor. Window cleaning infrastructure has been designed into the scheme.

A risk arises from the provision of communal roof gardens. There is the potential for falls. The parapet height has been designed to ensure that all users of this space are safely secured. Signage will be provided to warn residents and their visitors.

16.5 PREDICTED IMPACTS - RISK OF MAJOR ACCIDENTS AND/OR DISASTERS

A Risk Register has been developed which contains the main risks identified with the construction and operation of the Proposed Project. These have been identified as follows:

Table 16.2 Risk Impacts

Risk No.	Risk Event	Possible Cause
1	Accidents during construction	- Traffic accident - Working at height - Risk of fire - Groundwater pollution
2	Fire following occupation	- Inappropriate use of electrical devices / cooking etc.
3	Falls	- Falling from communal gardens - Window cleaning

16.6 RISK ANALYSIS

Following identification of risks, the next stage is to analyse how likely this is to occur and the consequences, should the risk arise. This will provide a risk score, i.e. the consequences versus the likelihood of the event taking place.

Table 16.3: Risk Analysis

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score
1a	Accidents during construction	Movement of vehicles	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1b		Manual handling	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1c		Slips or falls	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1d		Ground water pollution	Impact on aquatic life, illness	1	Lack of direct pathways, controls of run-off during construction	3	Could result in environmental pollution	3
2	Fire following occupation	Electrical equipment / cooking	Injury or loss of life	1	Causes of fire statistics	3	Could result in loss of life	3
3	Falls	Loss of balance	Injury or loss of life	1	CSO statistics	3	Could result in loss of life	3

16.7 Risk Evaluation

Taking the above table, and applying it below, the red zone represents 'high risk' scenarios', the amber zone represents 'medium risk scenarios' and the green zone represents 'low risk scenarios.'

Table 16.4 : Risk Evaluation

Likelihood Rating							
	Very Likely	5					
	Likely	4					
	Unlikely	3			1a – 9, 1b – 9 1c – 9, 1d - 3		
	Very Unlikely	2				3 - 3	
	Extremely Unlikely	1		4-2		2 - 3	
			Minor	Limited	Serious	Very Serious	Catastrophic
			1	2	3	4	5
			Consequence Rating				

16.8 Main Risks

The main risks arise during the construction period. Consequences may be limited but severe for the individuals concerned. Geographical widespread environmental consequences are not anticipated.

16.9 Mitigation Measures

The Construction Management Plan as well as good housekeeping practices will limit the risk of accidents during construction. Environmental monitoring with real time data and regular inspections by the relevant authorities.

16.10 Interactions

There are interactions with Population and Human Health, Land, Soils, Geology and Hydrogeology, Surface Water, Noise, Climate and Air, Material Assets, Traffic and Transport, Landscape and Visual, and Cultural Heritage.

16.11 Conclusion

Through the implementation of mitigation measures, there are no identified incidents or examples of major accidents and or natural disasters that present a sufficient combination of risk and consequence that would lead to significant residual impacts or environmental effects.

References:

ARUP: *Luas Cross City EIAR Risk of Major Accident And Or Disaster*, 2017

DD *A National Risk Assessment for Ireland* 2017

DHPLG: Causes of Fire Attended by Brigades 2015

DHPLG: *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* 2018

DOELG: *A Framework For Major Emergency Management Guidance Document 1: A Guide To Risk Assessment In Major Emergency Management* 2010

Department of the Taoiseach *National Risk Assessment Overview of Strategic Risks* 2017

EPA: *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* 2017

EPA: *Guidance on Assessing and Costing Environmental Liabilities* 2014

Irish Water Safety: Analysis of Drowning 2014

Jacobs Tobin *Greater Dublin Drainage Project for Irish Water* 2018

https://www.hsa.ie/eng/Topics/Statistics/Infographics/2013_Injury_Fatality_Statistics_Infographic.gif

Appendix 4:

Archaeology

Appendix 4.1 Figures

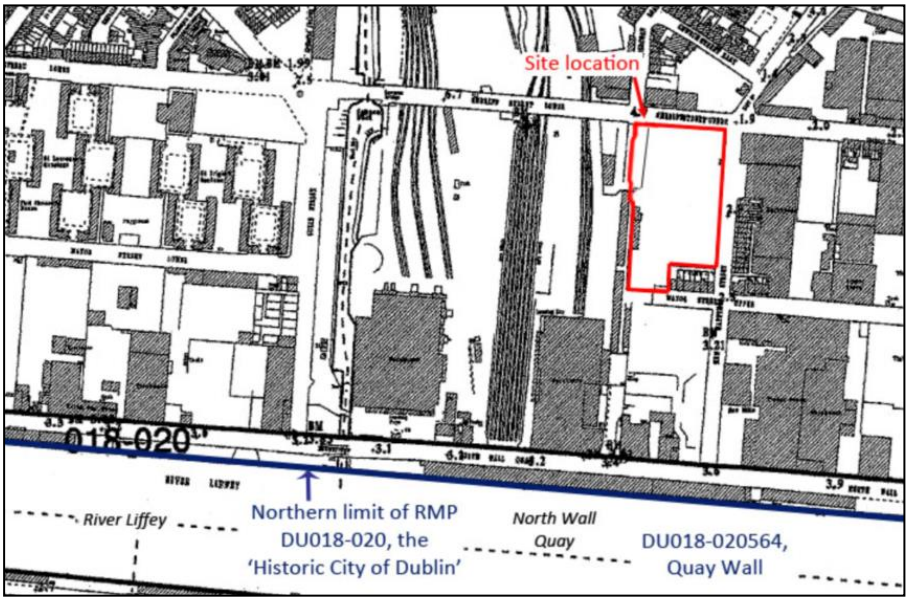


Figure 4.1 RMP map showing location of proposed development

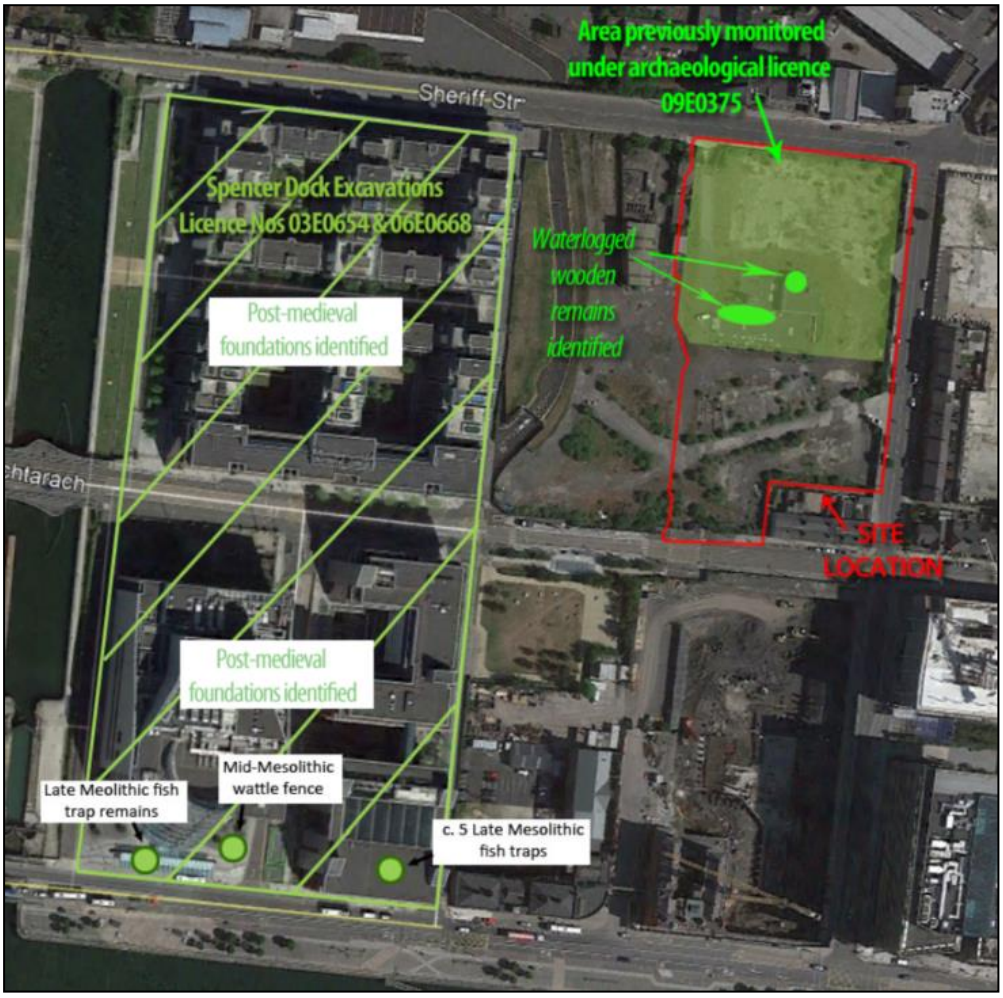


Figure 4.2 Aerial photograph showing site location and relevant previous archaeological investigations in the immediate vicinity

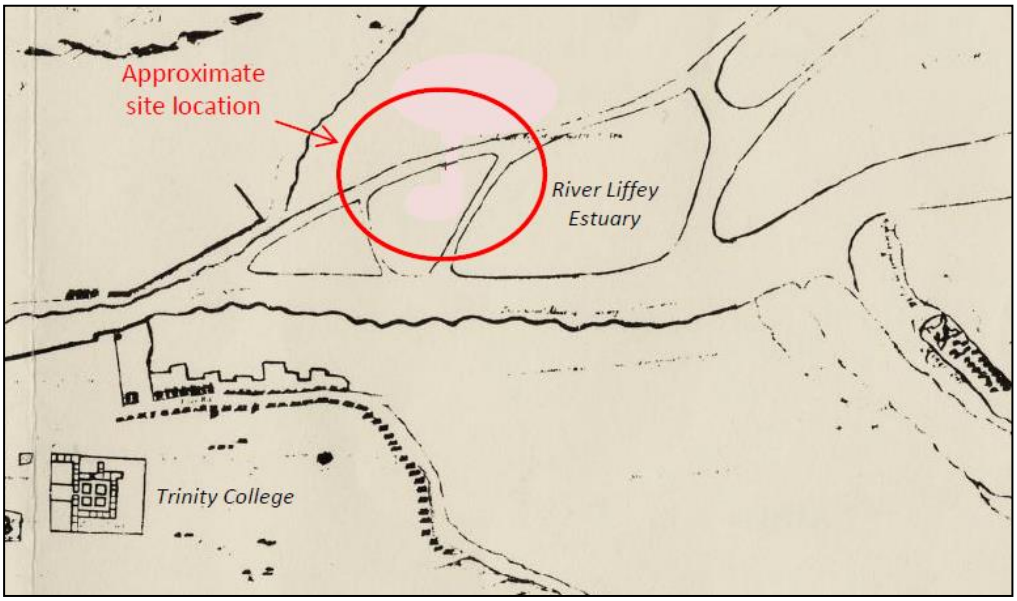


Figure 4.3 Detail from de Gomme's map of Dublin (1673)

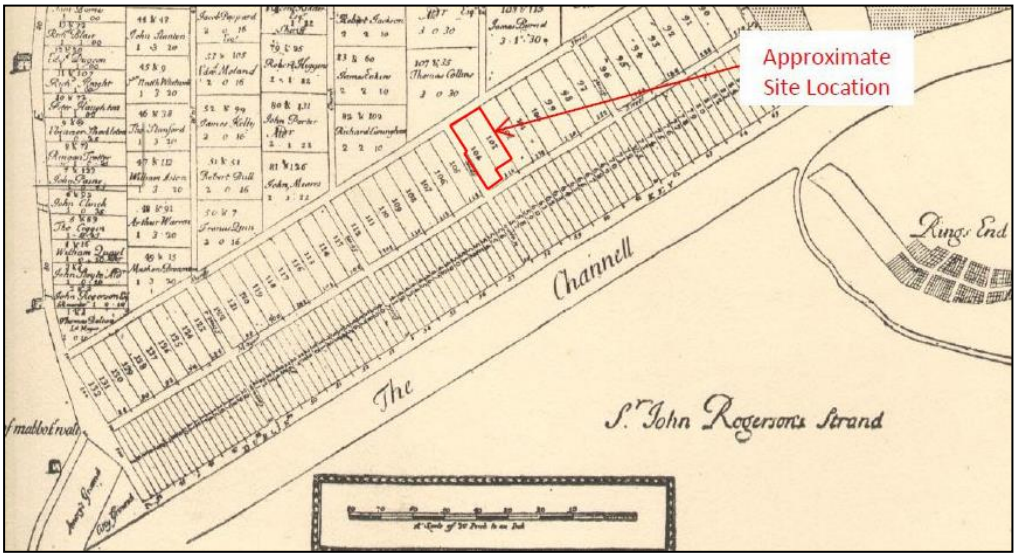


Figure 4.4 Detail from Bolton's Map (1717)

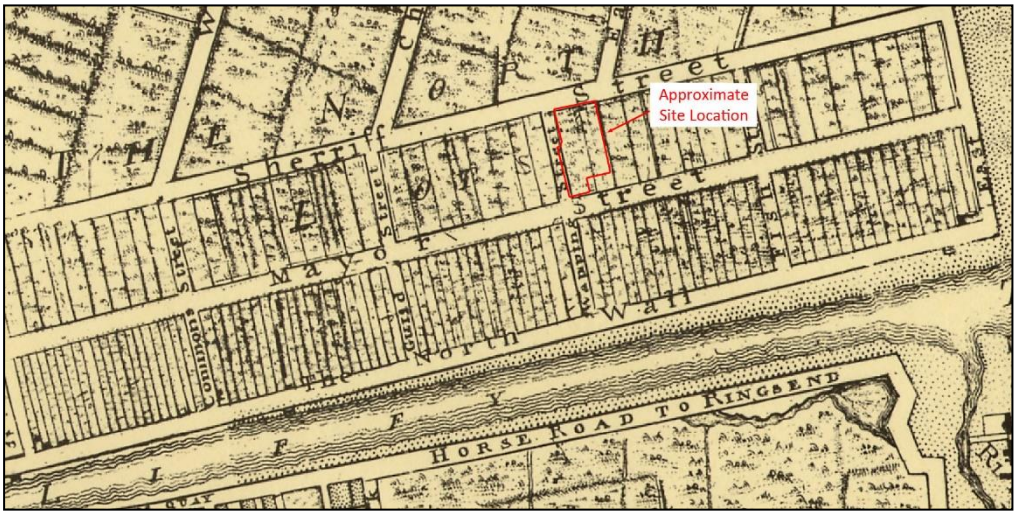


Figure 4.5 Detail from Rocque's map of Dublin

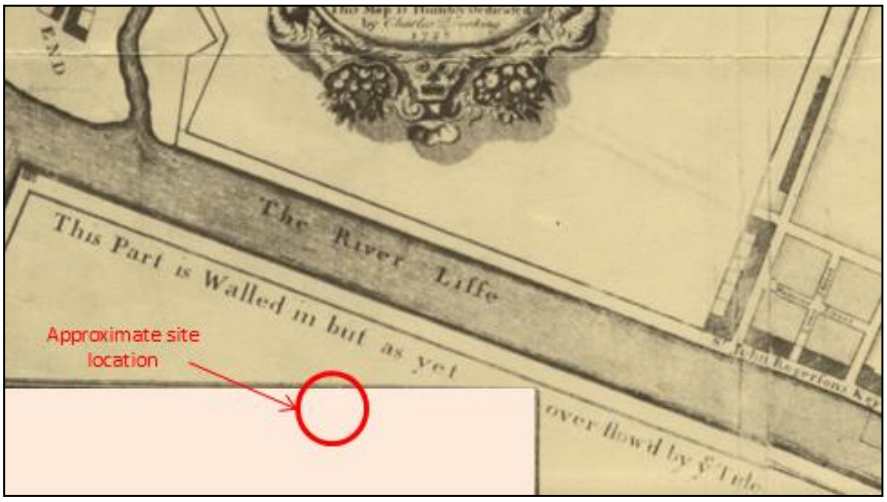


Figure 4.6 Detail from Brooking's map of Dublin (1728)

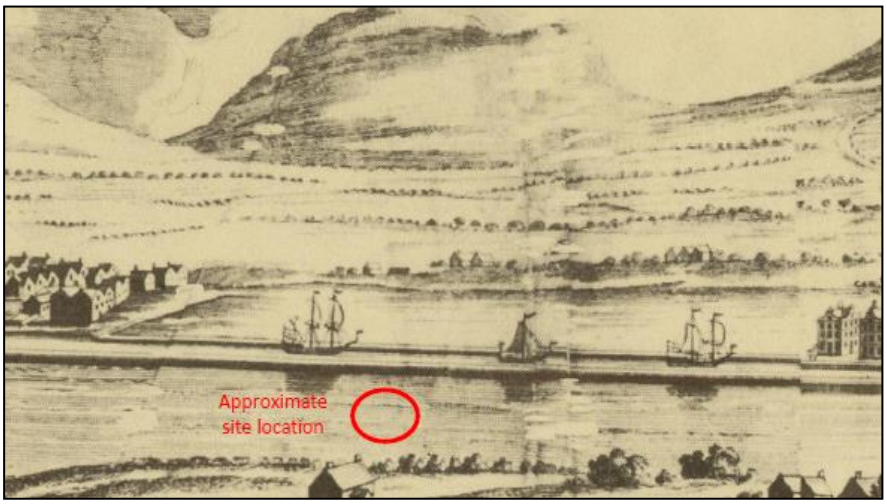


Figure 4.7 Detail from Brooking's map of Dublin, showing the prospect from the north (1728)

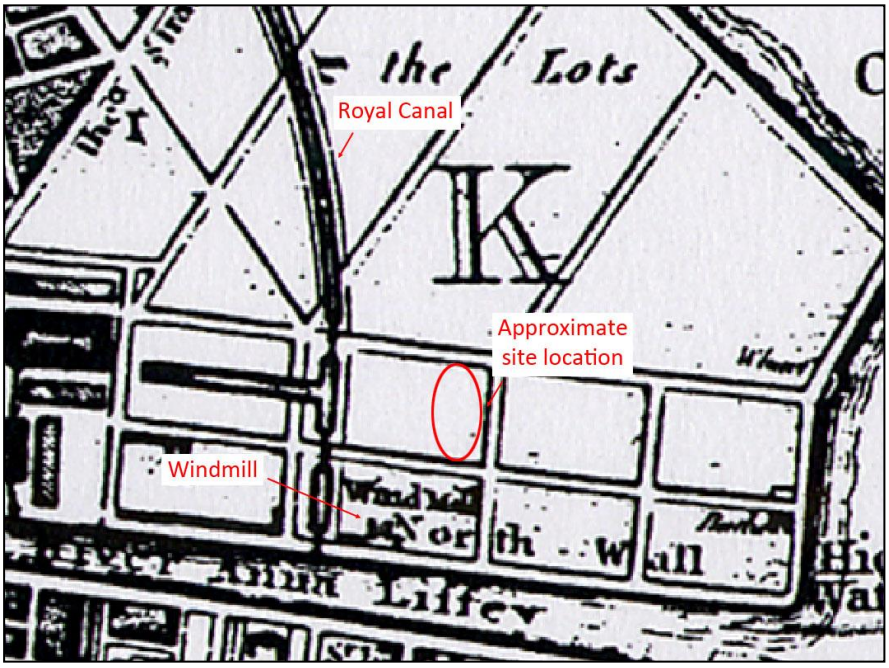


Figure 4.8 Detail from Taylor's map of Dublin (1816)

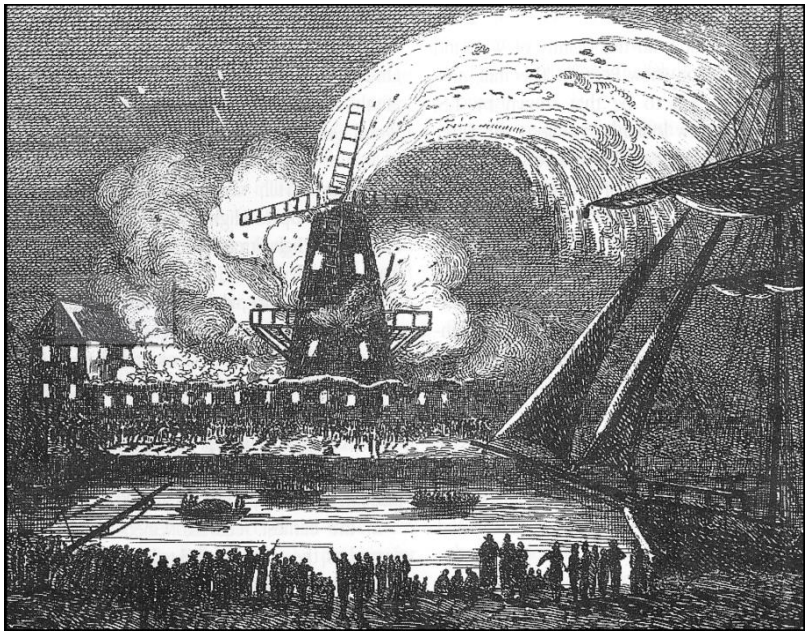


Figure 4.9 A View of the Late Fire on the North Wall, Brocal (1810)

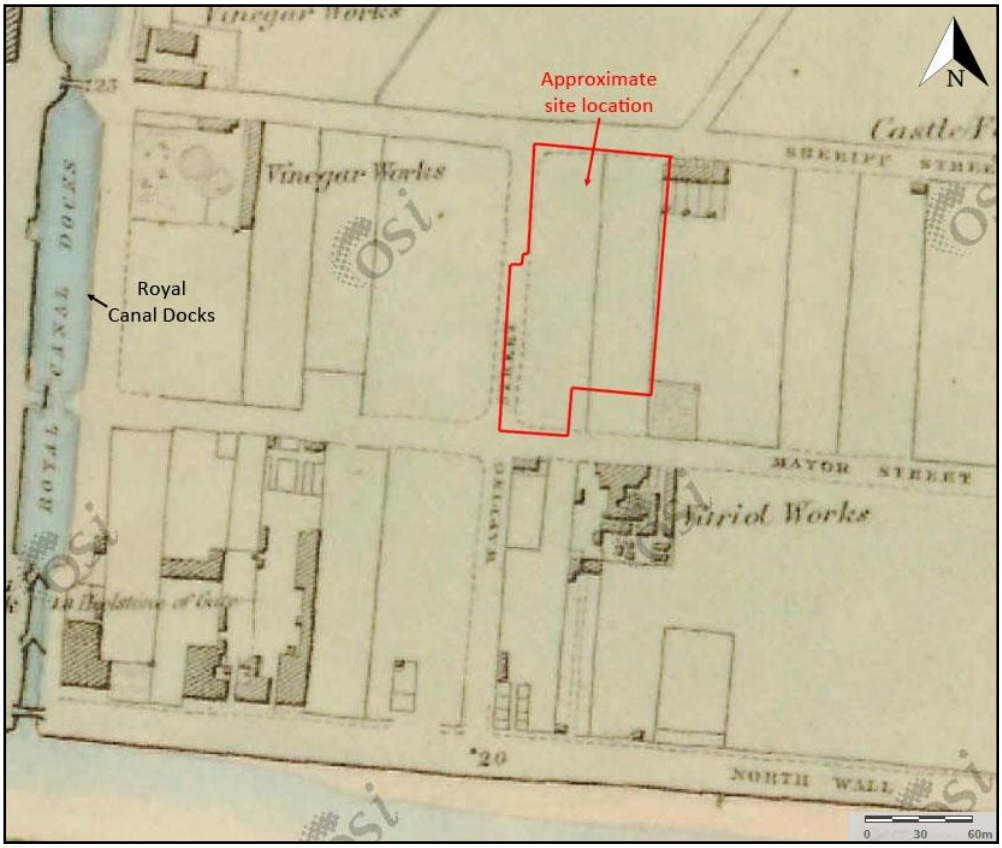


Figure 4.10 Extract from the First Edition Ordnance Survey Six-inch map (1837)

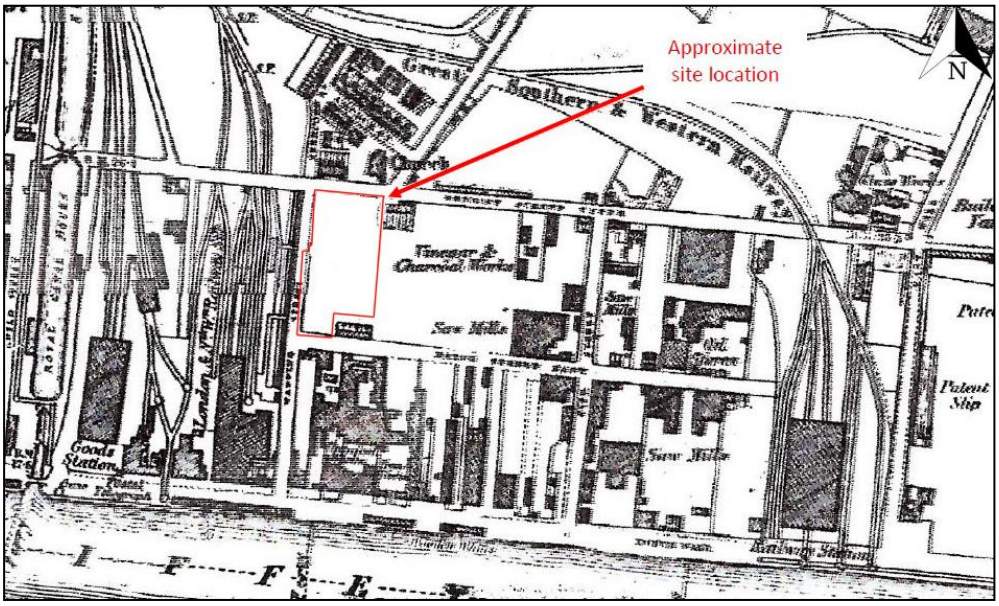


Figure 4.11 Extract from the revised edition Ordnance Survey Six-inch map (1876)

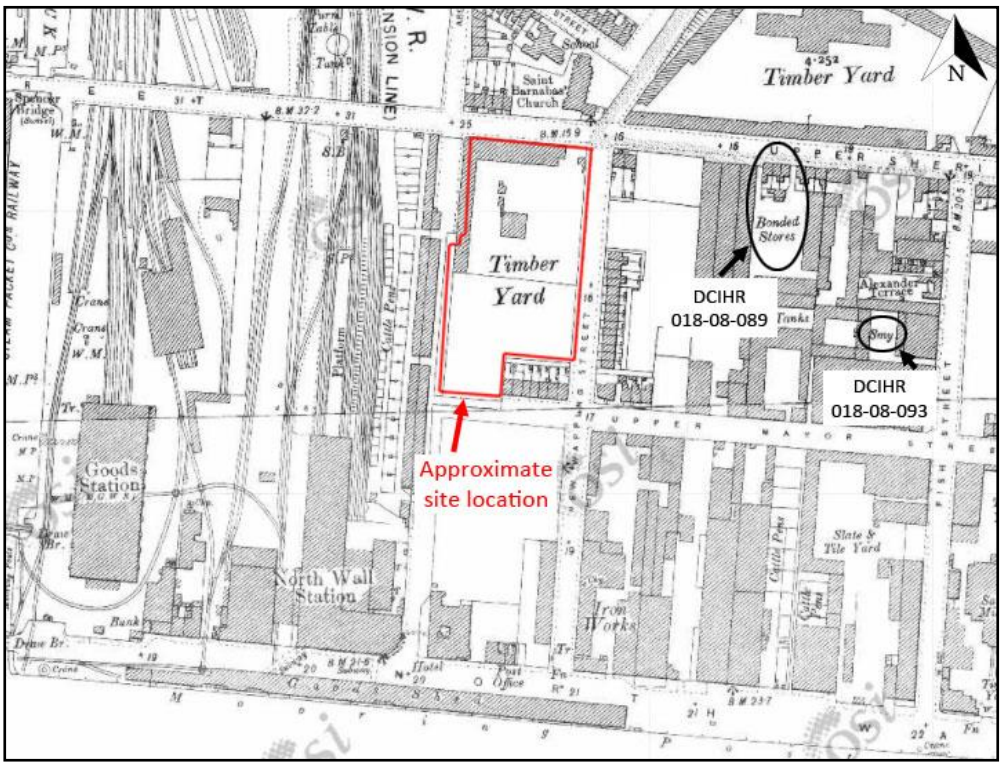


Figure 4.12 Extract from the revised edition Ordnance Survey 25-inch map (1907-8)

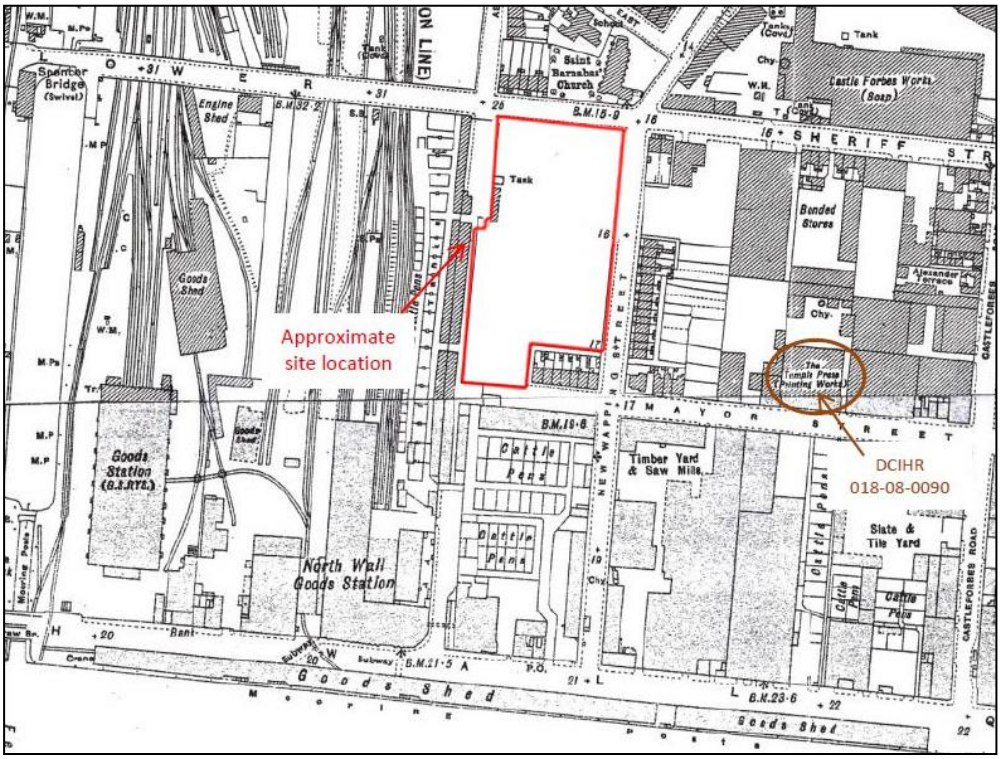


Figure 4.13 Extract from the revised edition Ordnance Survey 25-inch map (1935-6)

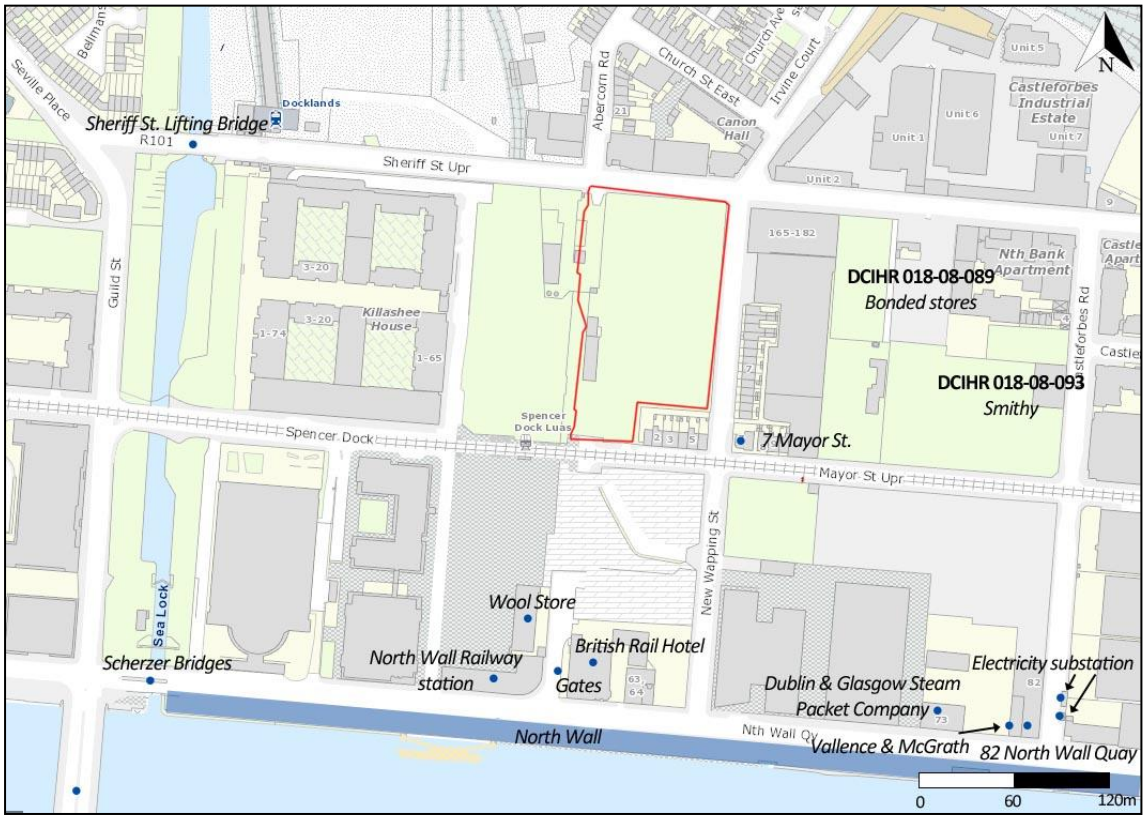


Figure 4.14 Built Heritage at North Wall & Spencer Dock

Appendix 4.2 Summary of Relevant Legislation

National Monuments (Amendment) Act (1930-2014)

All archaeological sites have the full protection of the national monuments legislation (Principal Act 1930; Amendments 1954, 1987, 1994, 2004 and 2014). In the 1987 Amendment of Section 2 of the Principal Act (1930), the definition of a national monument is specified as:

> *any artificial or partly artificial building, structure or erection or group of such buildings, structures or erections;*
>
> *any artificial cave, stone or natural product, whether forming part of the ground, that has been artificially carved, sculptured or worked upon or which (where it does not form part of the place where it is) appears to have been purposely put or arranged in position;*
>
> *any, or any part of any, prehistoric or ancient tomb, grave or burial deposit, or*
>
> *(ii) ritual, industrial or habitation site*

and

> *any place comprising the remains or traces of any such building, structure or erection, any cave, stone or natural product or any such tomb, grave, burial deposit or ritual, industrial or habitation site...*

Under Section 14 of the Principal Act (1930):

It shall be unlawful...

> *to demolish or remove wholly or in part or to disfigure, deface, alter, or in any manner injure or interfere with any such national monument without or otherwise than in accordance with the consent hereinafter mentioned (a licence issued by the Office of Public Works National Monuments Branch),*

or

> *to excavate, dig, plough or otherwise disturb the ground within, around, or in the proximity to any such national monument without or otherwise than in accordance...*

Under Amendment to Section 23 of the Principal Act (1930),

> *A person who finds an archaeological object shall, within four days after the finding, make a report of it to a member of the Garda Síochána...or the Director of the National Museum...*

The latter is of relevance to any finds made during a watching brief.

In the 1994 Amendment of Section 12 of the Principal Act (1930), all the sites and 'places' recorded by the Sites and Monuments Record of the Office of Public Works are provided with a new status in law. This new status provides a level of protection to the listed sites that is equivalent to that accorded to 'registered' sites [Section 8(1), National Monuments Amendment Act 1954] as follows.

The Commissioners shall establish and maintain a record of monuments and places where they believe there are monuments and the record shall be comprised of a list of monuments and such places and a map or maps showing each monument and such place in respect of each county in the State.

The Commissioners shall cause to be exhibited in a prescribed manner in each county the list and map or maps of the county drawn up and publish in a prescribed manner information about when and where the lists and maps may be consulted.

In addition, when the owner or occupier (not being the Commissioners) of a monument or place which has been recorded, or any person proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such monument or place, he shall give notice in writing of his proposal to carry out the work to the Commissioners and shall not, except in the case of urgent necessity and with the consent of the Commissioners, commence the work for a period of two months after having given the notice.

Under the National Monuments Amendment Act (2004), the Minister of Environment, Heritage and Local Government will issue directions relating to archaeological works and will be advised by the National Monuments Section and the National Museum of Ireland. The Act sets out the circumstances whereby the Minister of Environment, Heritage and Local Government may grant consent (i.e. In respect of a national monument of which the Minister or a local authority are the owners or the guardians or in respect of which a preservation order is in force) or issue directions (i.e. in relation to approved road developments—being road development approved under either or both sections 49 and 51 of the Roads Act 1993).

14A. (1) The consent of the Minister under section 14 of this Act and any further consent or licence under any other provision of the National Monuments Acts 1930 to 2004 shall not be required where the works involved are connected with an approved road development.

14A. (2) Any works of an archaeological nature that are carried out in respect of an approved road development shall be carried out in accordance with the directions of the Minister, which directions shall be issued following consultation by the minister with the Director of the National Museum of Ireland.

14A (4) Where a national monument has been discovered to which subsection (3) of this section relates, then the road authority carrying out the road development shall report the discovery to the Minister subject to subsection (7) of this section, and pending any directions by the minister under paragraph (d) of this subsection, no works which would interfere with the monument shall be carried out, except works urgently required to secure its preservation carried out in accordance with such measures as may be specified by the Minister

The Minister will consult with the Director of the National Museum of Ireland for a period not longer than 14 days before issuing further directions in relation to the national monument.

The Minister will not be restricted to archaeological considerations alone, but will also consider the wider public interest.

Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999

This Act provides for the establishment of a national inventory of architectural heritage and historic monuments.

Section 1 of the act defines “architectural heritage” as:-

(a) all structures and buildings together with their settings and attendant grounds, fixtures and fittings,

(b) groups of such structures and buildings, and,

(c) sites

which are of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

Section 2 of the Act states that the Minister (for Arts, Heritage, Gaeltacht and the Islands) shall establish the NIAH, determining its form and content, defining the categories of architectural heritage, and specifying to which category each entry belongs. The information contained within the inventory will be made available to planning authorities, having regard to the security and privacy of both property and persons involved.

Section 3 of the Act states that the minister may appoint officers, who may in turn request access to premises listed in the inventory from the occupiers of these buildings. The officer is required to inform the occupier of the building why entry is necessary, and in the event of a refusal, can apply for a warrant to enter the premises.

Section 4 of the Act states that obstruction of an officer or a refusal to comply with requirements of entry will result in the owner or occupier being guilty of an offence.

Section 5 of the Act states that sanitary authorities who carry out works on a monument covered by this Act will as far as possible preserve the monument with the proviso that its condition is not a danger to any person or property, and that the sanitation authority will inform the Minister that the works have been carried out.

The provisions in the Act are in addition to and not a substitution for provisions of the National Monument Act (1930–94), and the protection of monuments in the National Monuments Act is extended to the monuments covered by the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act (1999).

Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000

The Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act provides for the establishment of a national inventory of architectural heritage and historic monuments.

Section 1 of the act defines “architectural heritage” as:

(a) all structures and buildings together with their settings and attendant grounds, fixtures and fittings,

(b) groups of such structures and buildings, and,

(c) sites, which are of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

The Local Government (Planning and Development) Act, 1999, which came into force on 1st January 2000, provides for the inclusion of protected structures into the planning authorities’ development plans and sets out statutory regulations regarding works affecting such structures, thereby giving greater statutory protection to buildings. All structures listed in the development plan are now referred to as Protected Structures and enjoy equal statutory protection. Under the 1999 Act the entire structure is protected, including a structures interior, exterior, the land lying within the curtilage of the protected structure and other structures within that curtilage. This Act was subsequently repealed and replaced by the Planning and Development Act, 2000, where the conditions relating to the protection of architectural heritage are set out in Part IV of the Act.

The main features of the 2000 Act are:

a) planning authorities have a clear obligation to create a record of protected structures (RPS) which includes all structures or parts of structures in their functional areas which, in their opinion, are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. This record forms part of a planning authority's development plan.

b) planning authorities are also obliged to preserve the character of places and townscapes which are of special architectural, historic, archaeological, artistic, cultural, scientific, social or technical interest or that contribute to the appreciation of protected structures, by designating them architectural conservation areas (ACAs) in their development plan.

c) development plans must include objectives for the protection of such structures and the preservation of the character of such areas to ensure proper and sustainable planning and development.

d) new responsibilities are given to the owners and occupiers of protected structures to maintain them and planning authorities have additional powers to ensure that buildings are not endangered either directly or through neglect.5 Financial assistance, in the form of conservation grants, is available from planning authorities to assist in this process.

e) the owner or occupier of a protected structure may seek a declaration from the relevant planning authority to determine the works to the structure that would materially affect its character and therefore require planning permission, and those works which may be carried out as exempted development.

f) where a structure is protected, the protection includes the structure, its interior and the land within its curtilage and other structures within that curtilage (including their interiors) and all fixtures and features which form part of the interior or exterior of all these structures. All works which would materially affect the character of a protected structure, or a proposed protected structure, will require planning permission.

Appendix 4.3 Glossary of Impact Assessment

Significance Criteria (NRA Guidelines 2006)

The significance criteria can be used to evaluate the significance of an archaeological site, monument or complex. It should not, however, be regarded as definitive, rather it is an indicator which contributes to a wider judgment based on the individual circumstances of a feature. Different archaeological heritage asset types lend themselves more easily to assessment and it should be borne in mind that this can create a bias in the record, for example an upstanding stone monument such as a fortified house is easier to examine with a view to significance than a degraded enclosure site.

Table 2: Significance Criteria, NRA Guidelines 2006 (Archaeological Heritage)

Criteria	Explanation
Existing Status	The level of protection associated with an archaeological site / monument is an important consideration.
Condition /Preservation	The survival of a monument's archaeological potential both above and below ground is an important consideration and should be assessed in relation to its present condition and surviving features. Well-preserved sites should be highighted, this assessment can only be based on a field inspection.
Documentation /Historical Significance	The significance of a monument may be enhanced by the existence of records of previous investigations or contemporary documentation supported by written evidence or historic maps. Sites with a definite historical association or an example of a notable event or person should be highlighted.
Group Value	The value of a single monument may be greatly enhanced by its association with related contemporary monuments or with monuments from different periods indicating an extended time presence in any specific area. In some cases it may be preferable to protect the complete group, including associated and adjacent land, rather than to protect isolated monuments within that group.
Rarity	The rarity of some monument types can be a central factor affecting response strategies for development, whatever the condition of the individual feature. It is important to recognise sites that have a limited distribution.
Visibility in the Landscape	Monuments that are highly visible in the landscape have a heightened physical presence. The inter-visibility between monuments may also be explored in this category.
Fragility/ Vulnerability	It is important to assess the level of threat to archaeological monuments from erosion, natural degradation, agricultural activity, land clearance, neglect, careless treatment or development. The nature of the archaeological evidence cannot always be specified precisely but it may still be possible to document reasons to justify the significance of the feature. This category relates to the probability of monuments producing material of archaeological significance as a result of future investigative work.
Amenity Value	Regard should be taken of the existing and potential amenity value of a monument.

Determining Significance of Architectural Heritage Assets

The significance of perceived impact on structures and sites of architectural merit is determined by a combination of the architectural heritage importance of the structure and the degree of impact. In each case the structure is given a rating as to its importance and, if higher than "Record only", the nature of its special interest is given. The rating definitions are in accordance with those given by the National Inventory of Architectural Heritage (NIAH):

- *International:* Structures or sites of sufficient architectural heritage importance to be considered in an international context. Examples include St Fin Barre's Cathedral, Cork. These are exceptional structures that can be compared to and contrasted with the finest architectural heritage in other countries.

- *National:* Structures or sites that make a significant contribution to the architectural heritage of Ireland. These are structures and sites that are considered to be of great architectural heritage significance in an Irish context. Examples include Ardnacrusha Power Station, Co. Clare; the Ford Factory, Cork; Carroll's Factory, Dundalk; Lismore Castle, Co. Waterford; Sligo Courthouse, Sligo; and Emo Court, Co. Laois.

- *Regional:* Structures or sites that make a significant contribution to the architectural heritage within their region or area. They also stand in comparison with similar structures or sites in other regions or areas within Ireland. Examples would include many Georgian terraces; Nenagh Courthouse, Co. Tipperary; or the Bailey Lighthouse, Howth. Increasingly, structures that need to be protected include structures or sites that make a significant contribution to the architectural heritage within their own locality. Examples of these would include modest terraces and timber shop fronts.

- *Local:* These are structures or sites of some vintage that make a contribution to the architectural heritage but may not merit being placed in the RPS separately. Such structures may have lost much of their original fabric.

- *Record only:* These are structures or sites that are not deemed to have sufficient presence or inherent architectural or other importance at the time of recording to warrant a higher rating. It is acknowledged, however, that they might be considered further at a future time.

Where the rating is deemed to be higher than "Record only" the category of special interest is noted. It should be noted that the term "special architectural interest" applies only in the context of this assessment of architectural heritage and does not imply that those buildings and other structures that are not considered to be of special architectural interest are in any way inferior or are of lower value.

The special interest is based on the categories set down in the Planning and Development Act, 2000. While that Act gives no criteria for assigning a special interest to a structure, the National Inventory of Architectural Heritage (NIAH) offers guidelines to its field-workers. This offers guidance by example rather than by definition, and is the system adopted for the present assessment. There are eight categories set down in the Act, viz. archaeological, architectural, historical, technical, cultural, scientific, social and artistic, and the NIAH guidance for each is as follows:

Archaeological

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

Architectural

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

- An aspiration of aesthetic appeal to its design.
- Good quality or well executed architectural design
- The work of a known and distinguished architect, engineer, designer, craftsman
- Modest or vernacular structures may be considered to be of architectural interest, as they are part of the history of the built heritage of Ireland.
- Well-designed decorative features, externally and/or internally.

Historical

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

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

Technical

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

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

Cultural

A structure may be considered of special cultural interest where there is an association with a known fictitious character or event, e.g., Sandycove Martello Tower which featured in Ulysses.

Scientific

A structure may be considered of special scientific interest where it is considered to be an extraordinary or pioneering scientific or technical achievement in the Irish context, e.g., Mizen Head Bridge, Birr Telescope.

Social

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

- A focal point of spiritual, political, national or other cultural sentiment to a group of people, e.g. a place of worship, a meeting point, assembly rooms.
- Developed or constructed by a community or organisation, e.g. the construction of the railways or the building of a church through the patronage of the local community
- Illustrates a particular lifestyle, philosophy, or social condition of the past, e.g. the hierarchical accommodation in a country house, philanthropic housing, vernacular structures.

Artistic

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

- Work of a skilled craftsman or artist, e.g. plasterwork, wrought-iron work, carved elements or details, stained glass, stations of the cross.
- Well-designed mass produced structures or elements may also be considered of artistic interest.
- In the evaluation of the special interest of a structure it is possible for the structure to have a special interest under more than one of the above categories.

Assessment of Material Assets, as Defined by the EPA (2002)

Context Describe the location and extent of the asset. Does it extend beyond the site boundary?

Character Describe the nature and use of the asset. It is exploited, used or accessible? Is it renewable or non-renewable and if so, over what period?

Significance Describe the significance of the asset. Is the material asset unique, scarce or common in the region? Is its use controlled by known plans, priorities or policies? What trends are evident or may reasonably be inferred?

Sensitivity Describe the changes in the existing environment which could limit the access to, or the use of, the material asset.

Glossary of Impacts as defined by the NRA Guidelines 2006, with reference to the EPA (2002 & 2017)

Impacts are generally categorised as either being a direct impact, an indirect impact or as having no predicted impact. A glossary of impacts as defined by the EPA are as follows: -

- A **direct impact** occurs when a cultural heritage asset is located within the proposed development area and entails the removal of part, or the entire asset.
- **Indirect impacts** may be caused due to the close proximity of a development to a cultural heritage asset. Mitigation strategies and knowledge of detail design can often ameliorate any adverse indirect impact. Indirect impacts may include severance of linked features, degradation of setting and amenity or provide a visual intrusion.

- **No predicted impact** occurs when the proposed development does not adversely or positively affect a cultural heritage asset.

The impacts of the proposed scheme on the cultural heritage environment are first assessed in terms of their quality i.e. positive, negative, neutral (or direct and indirect):

Negative Impact A change that will detract from or permanently remove a cultural heritage asset from the landscape.

Neutral Impact A change that does not affect the cultural heritage asset.

Positive Impact A change that improves or enhances the setting of a cultural heritage asset.

Duration of Impacts:

Temporary Impact Impact lasting for one year or less.

Short-term Impacts Impact lasting one to seven years.

Medium-term Impact Impact lasting seven to fifteen years.

Long-term Impact Impact lasting fifteen to sixty years.

Permanent Impact Impact lasting over sixty years.

Types of Impacts:

Cumulative Impact The addition of many small impacts to create one larger, more significant, impact.

Do Nothing Impact The environment as it would be in the future should no development of any kind be carried out.

Indeterminable Impact When the full consequences of a change in the environment cannot be described.

Irreversible Impact When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.

Residual Impact The degree of environmental change that will occur after the proposed mitigation measures have taken effect.

'*Worst case' Impact* The impacts arising from a development in the case where mitigation measures substantially fail.

Magnitude of Impact

Extent – size, scale and spatial distributions of the effect

Duration – period of time over which the effect will occur

Frequency – how often the effect will occur

Context – how will the extent, duration and frequency contrast with the accepted baseline conditions.

Table 3: Magnitude Criteria

Magnitude of Impact	Criteria
Very High	Applies where mitigation would be unlikely to remove adverse effects. Reserved for adverse, negative effects only. These effects arise where a cultural heritage asset is completely and irreversibly destroyed by a proposed development.
High	An impact which, by its magnitude, duration or intensity alters an important aspect of the environment. An impact like this would be where part of a cultural heritage asset would be permanently impacted upon leading to a loss of character, integrity and data about the archaeological / cultural heritage feature/site.
Medium	A moderate direct impact arises where a change to the site is proposed which though noticeable is not such that the archaeological / cultural heritage integrity of the site is compromised and which is reversible. This arises where an archaeological / cultural heritage feature can be incorporated into a modern day development without damage and that all procedures used to facilitate this are reversible.
Low	An impact which causes changes in the character of the environment which are not significant or profound and do not directly impact or affect an archaeological / cultural heritage feature, site or monument.
Negligible	An impact capable of measurement but without noticeable consequences.
No change	No change to the asset or setting

Sensitivity Criteria

An evaluation of the sensitivity / value of sites and features is based on the extent to which assets contribute to the archaeological or built heritage character, though their individual or group qualities, either directly or potentially and guided by legislation, national policies, acknowledged standards, designations and criteria. The table below presents the scale of sensitivity / value together with criteria.

Table 4: Sensitivity Criteria

Sensitivity / Value	Criteria
Very High	Sites of international significance: World Heritage Sites National Monuments Protected Structures of international and national importance Designed landscapes and gardens of national importance Assets of acknowledged international importance or that can contribute significantly to international and national research objectives

Sensitivity / Value	Criteria
High	RMP / SMR sites Designated assets that contribute to regional research objectives Protected Structures of regional importance Architectural Conservation Areas
Medium	Recently / newly identified archaeological sites (not yet included on the SMR / RMP; the importance of the resource has yet to be fully ascertained) Undesignated assets that contribute to regional research objectives NIAH Building Survey and Garden Survey Sites
Low	Undesignated Sites of local importance (e.g. townland / field boundaries) Assets compromised by poor preservation and/or poor survival of contextual associations Assets of limited value but with the potential to contribute to local research objectives (e.g. potential buried foundations associated with features / structures shown the 1st edition OS six-inch mapping) Historic townscapes or built up areas of limited historic integrity in their building or their settings
Negligible	Assets with very little or no surviving archaeological interest. Buildings of no architectural or historic note
Unknown	The nature of the resource has yet to be fully ascertained, e.g. sites or areas of specific archaeological potential, greenfield areas or riverine / stream / coastal environs with inherent archaeological potential. Structures with potential historic significance (possibly hidden or inaccessible).

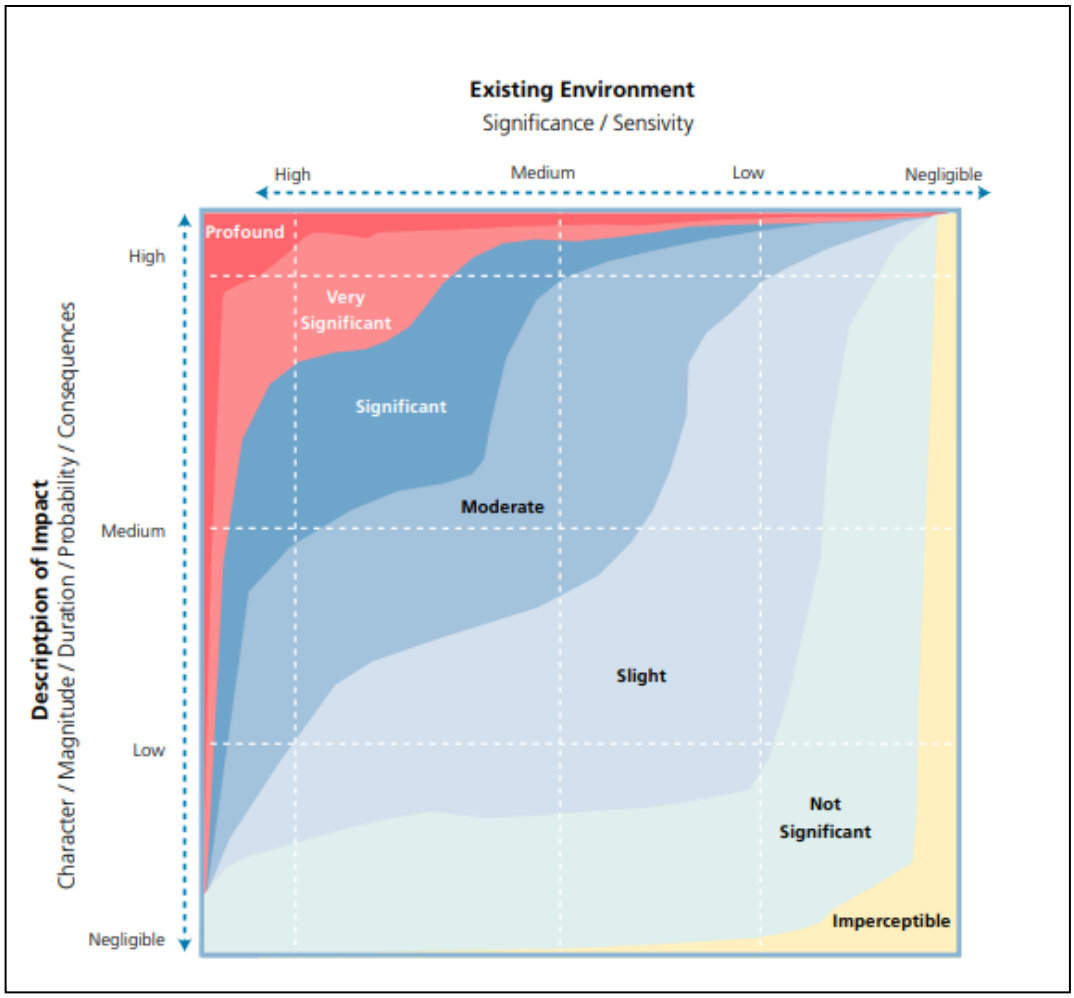
Criteria for Assessment of Impact Significance

Using both the sensitivity of the heritage asset and the magnitude of impact, the impact significance is established (Table 6).

The Draft EPA Revised Guidelines on Information to be contained within an EIS (September 2015) has also added the following levels of significance of effect (as per figure below):

Table 5 – Significance of Effects (EPA draft 2015)

Significance of Effect	Description
Very Significant	An impact which by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment, for example in this case a monument
Not Significant	An effect which causes noticeable changes in the character of the environment but without noticeable consequences.



Source: Draft EPA Revised Guidelines on Information to be contained within Environmental Impact Assessment Reports (August 2017), p.53

Appendix 4.4 North Lotts and Grand Canal Dock SDZ Planning Scheme

Excerpt on approach to built heritage, industrial heritage assets and archaeology (p. 85-86)

The conservation of Docklands' architectural heritage is a key component of the SDZ Planning Scheme. Conservation has played a major constructive role in the regeneration of the area so far, and its inherent value of lending a rich diversity of architectural fabric is central to the urban design approach for the SDZ.

On this basis, the over-arching conservation approach will be to ensure that the architectural and historical significance of the Docklands area is protected, conserved and enhanced.

The SDZ area includes a number of structures listed for protection. These buildings are to be retained as part of the design proposals for each city block. The area also includes industrial heritage artefacts which may not be listed on the Record of Protected Structures (RPS), but identified as worthy of protection in the Dublin City Industrial Heritage Record (DCIHR). The SDZ Planning Scheme promotes the retention of these artefacts where possible.

In terms of archaeology, best practice will be promoted for archaeological excavation and the dissemination of the findings of archaeological investigations through the publication of excavation reports, thereby creating public awareness and appreciation of the value of archaeological and industrial heritage resources. Underwater or inter-tidal archaeology is of particular relevance to the SDZ and the potential implications, including disturbance to the riverbed, will have to be assessed as part of any archaeological assessment. It will also be a goal to develop a long-term management plan for the conservation, enhancement, management and interpretation of archaeological sites and monuments and to identify areas for strategic research during the regeneration of the SDZ Area.

The SDZ Planning Scheme will have regard to the suite of statutory provisions and guidelines in relation to the built heritage, including the City Council's Record of Protected Structures (RPS) and Zones of Archaeological Interest. It will also ensure that any works to protected structures is in accordance with internationally established principles, national standards and best practice. For the avoidance of doubt, it will also have regard to the policies and objectives of Chapter 7.2 Built Heritage of the Dublin City Development Plan 2011-2017.

Area-Based Conservation Guidelines: Spencer Dock (p.88-89)

The Spencer Dock hub exhibits distinctive qualities of a railway building complex, which along with an historic building stock along parts of the North Wall Quay, references the area's original docking function.

The complex of buildings including the former Railway Hotel, Station Building and Woolstore lend a distinctive character to the area which sets it apart from other international dockland redevelopment and create a focal point of interest on approach to the city from Dublin Bay. Features such as the drawbridge and quay walls to the river and canal, also contribute to this unique character.

In the surrounding areas, there is still some remaining evidence of the former residential pattern of small-scale workers' cottages which would have been an integral part of the working docklands.

Proposals should respect the setting and visual qualities of the railway complex protected structures and provide for publicly accessible uses, active frontages and public spaces. The location of these buildings at

the proposed DART Underground Station and Station Square, present an opportunity to create an attractive civic space with special qualities.

Appendix 9:

Air Quality and Climate

APPENDIX 9.1

Ambient Air Quality Standards

National standards for ambient air pollutants in Ireland have generally ensued from Council Directives enacted in the EU (& previously the EC & EEC) (see Table 9.1). The initial interest in ambient air pollution legislation in the EU dates from the early 1980s and was in response to the most serious pollutant problems at that time which was the issue of acid rain. As a result of this sulphur dioxide, and later nitrogen dioxide, were both the focus of EU legislation. Linked to the acid rain problem was urban smog associated with fuel burning for space heating purposes. Also apparent at this time were the problems caused by leaded petrol and EU legislation was introduced to deal with this problem in the early 1980s.

In recent years the EU has focused on defining a basis strategy across the EU in relation to ambient air quality. In 1996, a Framework Directive, Council Directive 96/62/EC, on ambient air quality assessment and management was enacted. The aims of the Directive are fourfold. Firstly, the Directive's aim is to establish objectives for ambient air quality designed to avoid harmful effects to health. Secondly, the Directive aims to assess ambient air quality on the basis of common methods and criteria throughout the EU. Additionally, it is aimed to make information on air quality available to the public via alert thresholds and fourthly, it aims to maintain air quality where it is good and improve it in other cases.

As part of these measures to improve air quality, the European Commission has adopted proposals for daughter legislation under Directive 96/62/EC. The first of these directives to be enacted, Council Directive 1999/30/EC, has been passed into Irish Law as S.I. No 271 of 2002 (Air Quality Standards Regulations 2002), and has set limit values which came into operation on 17th June 2002. Council Directive 1999/30/EC, as relating to limit values for sulphur dioxide, nitrogen dioxide, lead and particulate matter, is detailed in Table 9.1. The Air Quality Standards Regulations 2002 detail margins of tolerance, which are trigger levels for certain types of action in the period leading to the attainment date. The margin of tolerance varies from 60% for lead, to 30% for 24-hour limit value for PM_{10}, 40% for the hourly and annual limit value for NO_2 and 26% for hourly SO_2 limit values. The margin of tolerance commenced from June 2002, and will start to reduce from 1 January 2003 and every 12 months thereafter by equal annual percentages to reach 0% by the attainment date. A second daughter directive, EU Council Directive 2000/69/EC, has published limit values for both carbon monoxide and benzene in ambient air as set out in Table 9.2. This has also been passed into Irish Law under the Air Quality Standards Regulations 2002.

The most recent EU Council Directive on ambient air quality was published on the 11/06/08 which has been transposed into Irish Law as S.I. 180 of 2011. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive and its subsequent daughter directives. Provisions were also made for the inclusion of new ambient limit values relating to $PM_{2.5}$. The margins of tolerance specific to each pollutant were also slightly adjusted from previous directives as outlined in Table 9.1. In regards to existing ambient air quality standards, it is not proposed to modify the standards but to strengthen existing provisions to ensure that non-compliances are removed. In addition, new ambient standards for $PM_{2.5}$ are included in Directive 2008/50/EC. The approach for $PM_{2.5}$ is to establish a target value of 25 µg/m^3, as an annual average (to be attained everywhere by 2010) and a limit value of 25 µg/m^3, as an annual average (to be attained everywhere by 2015), coupled with a target to reduce human exposure generally to $PM_{2.5}$ between 2010 and 2020. This exposure reduction target will range from 0% (for $PM_{2.5}$ concentrations of less than 8.5 µg/m^3 to 20% of the average exposure indicator (AEI) for concentrations of between 18 - 22 µg/m$^{3)}$. Where the AEI is currently greater than 22 µg/m^3 all appropriate measures should be employed to reduce this level to 18 µg/m^3 by 2020. The AEI is based on measurements taken in urban background locations averaged over a three year period

from 2008 - 2010 and again from 2018-2020. Additionally, an exposure concentration obligation of 20 µg/m^3 has been set to be complied with by 2015 again based on the AEI.

Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions. The Alert Threshold is defined in Council Directive 96/62/EC as "a level beyond which there is a risk to human health from brief exposure and at which immediate steps shall be taken as laid down in Directive 96/62/EC". These steps include undertaking to ensure that the necessary steps are taken to inform the public (e.g. by means of radio, television and the press).

The Margin of Tolerance is defined in Council Directive 96/62/EC as a concentration which is higher than the limit value when legislation comes into force. It decreases to meet the limit value by the attainment date. The Upper Assessment Threshold is defined in Council Directive 96/62/EC as a concentration above which high quality measurement is mandatory. Data from measurement may be supplemented by information from other sources, including air quality modelling.

An annual average limit for both NO_X (NO and NO_2) is applicable for the protection of vegetation in highly rural areas away from major sources of NO_X such as large conurbations, factories and high road vehicle activity such as a dual carriageway or motorway. Annex VI of EU Directive 1999/30/EC identifies that monitoring to demonstrate compliance with the NO_X limit for the protection of vegetation should be carried out distances greater than:

- 5 km from the nearest motorway or dual carriageway
- 5 km from the nearest major industrial installation
- 20 km from a major urban conurbation

As a guideline, a monitoring station should be indicative of approximately 1000 km^2 of surrounding area.

Under the terms of EU Framework Directive on Ambient Air Quality (96/62/EC), geographical areas within member states have been classified in terms of zones. The zones have been defined in order to meet the criteria for air quality monitoring, assessment and management as described in the Framework Directive and Daughter Directives. Zone A is defined as Dublin and its environs, Zone B is defined as Cork City, Zone C is defined as 21 urban areas with a population greater than 15,000 and Zone D is defined as the remainder of the country. The Zones were defined based on among other things, population and existing ambient air quality.

EU Council Directive 96/62/EC on ambient air quality and assessment has been adopted into Irish Legislation (S.I. No. 33 of 1999). The act has designated the Environmental Protection Agency (EPA) as the competent authority responsible for the implementation of the Directive and for assessing ambient air quality in the State. Other commonly referenced ambient air quality standards include the World Health Organisation. The WHO guidelines differ from air quality standards in that they are primarily set to protect public health from the effects of air pollution. Air quality standards, however, are air quality guidelines recommended by governments, for which additional factors, such as socio-economic factors, may be considered.

APPENDIX 9.2

Dust Minimisation Plan

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the following management plan has been formulated by drawing on best practice guidance from Ireland, the UK[10,23,24] and BRE[25]and the USA[26].

Site Management

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies.

At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 1 for the windrose for Dublin Airport). As the prevailing wind is predominantly westerly to south-westerly, locating construction compounds and storage piles downwind (to the east) of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed[24,25]. The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials[27]. Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods were care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised;
- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein;
- At all times, the procedures put in place will be strictly monitored and assessed.

The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

Measures Specific to Demolition

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
- Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

Site Roads / Haulage Routes

Movement of construction trucks along site roads (particularly unpaved roads) can be a significant source of fugitive dust if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80%[24].

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved site roads;
- Access gates to the site shall be located at least 10m from sensitive receptors where possible;
- Bowsers or suitable watering equipment will be available during periods of dry weather throughout the construction period. Research has found that watering can reduce dust emissions by 50%[26]. Watering shall be conducted during sustained dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use;
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.

Land Clearing / Earth Moving

Land clearing / earth-moving works during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust;
- During periods of very high winds (gales), activities likely to generate significant dust emissions should be postponed until the gale has subsided.

Storage Piles

The location and moisture content of storage piles are important factors which determine their potential for dust emissions.

- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles should be located downwind of sensitive receptors;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust. The regular watering of stockpiles has been found to have an 80% control efficiency[24];
- Where feasible, hoarding will be erected around site boundaries to reduce visual impact. This will also have an added benefit of preventing larger particles from impacting on nearby sensitive receptors.

Site Traffic on Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads should be reduced to a minimum by employing the following measures:

- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- At the main site traffic exits, a wheel wash facility shall be installed if feasible. All trucks leaving the site must pass through the wheel wash. In addition, public roads outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.

Monitoring

Monitoring of construction dust deposition at nearby sensitive receptors (residential dwellings) during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/(m^2*day) during the monitoring period between 28 - 32 days.

Summary of Dust Mitigation Measures

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed; and
- The specification of effective measures to deal with any complaints received.