CHAPTER 03:

ALTERNATIVES

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3.0 ALTERNATIVES

3.1 INTRODUCTION

The requirement to consider alternatives within an EIAR is set out in Annex IV (2) of the EIA Directive (Directive 2011/92/EU, as amended by Directive 2014/52/EU), and in Schedule 6 of the Planning and Development Regulations, 2001, as amended ("the Regulations"), which states:

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

Schedule 6(2)(b) of the Regulations elaborates on this requirement by requiring the following information:

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

Reasonable alternatives may include project design proposals, location, size and scale, which are relevant to the proposed development and its specific characteristics. The regulations require that an indication of the main reasons for selecting the preferred option, including a comparison of the environmental effects to be presented in the EIAR.

The EPA's *Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022)* – states:

> *The presentation and consideration of the various reasonable alternatives investigated by the developer is an important requirement of the EIA process.*
>
> *The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with 'an indication of the main reasons for selecting the chosen option'. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required.*

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

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

This section assesses the evolution of development and the alternatives examined by the Applicant relating to the location, size and scale and project design, technology of

the proposed development. This section provides a full justification for the proposed development and provides a comparison of the environmental effects of each alternative option.

The reasonable alternatives examined throughout the design process are set out as follows:

- Do Nothing Alternative;
- Alternative project locations;
- Alternative layout, size and scale; and
- Alternative processes..

This chapter describes the alternatives that were considered for the proposed development, where applicable, under each of these headings and the reasons for the selection of the chosen options, including a comparison of environmental effects.

3.2 DO NOTHING ALTERNATIVE

If the Proposed Development does not proceed, the existing development would remain in place.

A do-nothing scenario would result in a neutral effect on all environmental receptors.

The demand for additional office space in Dublin City Centre would still persist, necessitating the construction of the Proposed Development or multiple smaller developments elsewhere. The designated site for the proposed development is classified as 'Zone Z5 - City Centre' in the in the Dublin City Development Plan 2022 – 2028, for which the zoning objective is to "*consolidate and facilitate the development of the central area, and to identify, reinforce, strengthen and protect its civic design character and dignity*".

Considering an alternative location for the project would essentially mean adopting a 'do-nothing' approach for the current site.

Therefore, opting for the 'do-nothing' scenario would be underutilising this strategically positioned city centre site.

3.3 ALTERNATIVE PROJECT LOCATIONS

As noted in Section 4.13 of the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment "*some projects may be site specific so the consideration of alternative sites may not be relevant."* We also refer to the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022), which state that in some instances alternative locations may not be applicable or available for a specific project which is identified for a specific location.

The current zoning designation of the site already recognizes its compatibility with the proposed development, ensuring that it is in line with the intended land use objectives set forth by the local authority. Moreover, the presence of nearby developments of a similar nature further supports the appropriateness of the proposed project within the surrounding context. Additionally, the availability of necessary services and infrastructure in the vicinity enhances the feasibility and practicality of the proposed

development. This ensures that the site is adequately equipped to accommodate the project's requirements without significant challenges or limitations.

Considering the present zoning of the site, the surrounding land uses, the close proximity to similar associated developments, and the availability of necessary services and infrastructure, it is evident that the proposed development aligns with the most suitable use for this particular location. Given these factors, it is deemed unnecessary to explore alternative site locations in accordance with the EIAR legislation and guidance.

3.4 ALTERNATIVE LAYOUT, SIZE AND SCALE, AND DESIGN

The project design team lead by HJL Architects undertook a comprehensive design process to determine an effective and efficient design and layout of the proposed development that had regard to the environmental sensitivities of the site, and the surrounding site context.

The Architectural Design Statement prepared by HJL Architects included with the planning application sets out the design process undertaken. The design evolved as part of a multi-disciplinary process with input from the EIAR Team, design team and the Applicant.

The potential for significant environmental effects which informed this consideration primarily related to cultural heritage and conservation, landscape and visual impact, sunlight and daylight assessment and potential impacts on the amenities of established properties and uses in the area.

The alternative designs and layouts for the site were considered and assessed with regard to environmental effects prior to the finalisation of the site layout plan and design of the proposed development by the design team.

The arrangements considered the environmental sensitivities associated with surrounding land use and integration with the consented and proposed developments in the area.

The reasonable site alternative layouts considered are as follows:

- Option 1 – Retain and Extend Option
- Option 2 – New Build – 17-Storey Over Basement Option (Chosen Design Submission)

3.4.1 Option 1 – 17 Storey Extend Option

Option 1 considers retaining and refurbishing the current 6-storey over basement structure, while extending the current building an additional nine floors. The result of Option 1 is an 17-storey over 1 storey basement structure.

Option 1 would result in the establishment of 87,244 m^2 GIA (including basement).

The 17 Storey Extend option assumes the majority of the existing structure (foundations, floor slabs, beams, columns) are retained, building is extended so that the floor area is the same as Option 2 (see below), only includes a single storey basement as per the existing building and the basement floor area is assumed to increase slightly to approximately match the area of Option 2, but the rest of the additional floor area is created in the superstructure.

3.4.2 Option 2 – New Build – 17-Storey Over Basement

Option 2 considers the demolition of the existing development at 1 North Wall Quay and the construction of 17-storey office building over 2 no. basement levels.

Option 2 would result in the establishment of 87,244 m^2 GIA (including basement) and of 49,397 m^2 net area of office space.

Option 2 provides for the demolition of the existing building and construction of a new building ranging in height from 9 no. to 17 no. storeys over lower ground floor and double basement comprising of office accommodation, arts/community/cultural uses and a retail/café/restaurant unit. Office accommodation is provided from lower ground floor to 15th floor level, arts/community/cultural uses are provided at lower ground, ground, 1st and 16th floor level with a retail/café/restaurant unit at ground floor level. Landscaped terraces are located at 8th, 9th, 10th, 11th, 15th, 16th floor level with winter terraces located at 4th, 6th 9th floor level. Provision of a new landscaped street to the east of the building to include external arts/community/cultural uses. The double basement comprises 30 no. car parking spaces, 923 no. bicycle parking spaces and 6 no. motorbike spaces as well as shower/changing facilities and plantroom.

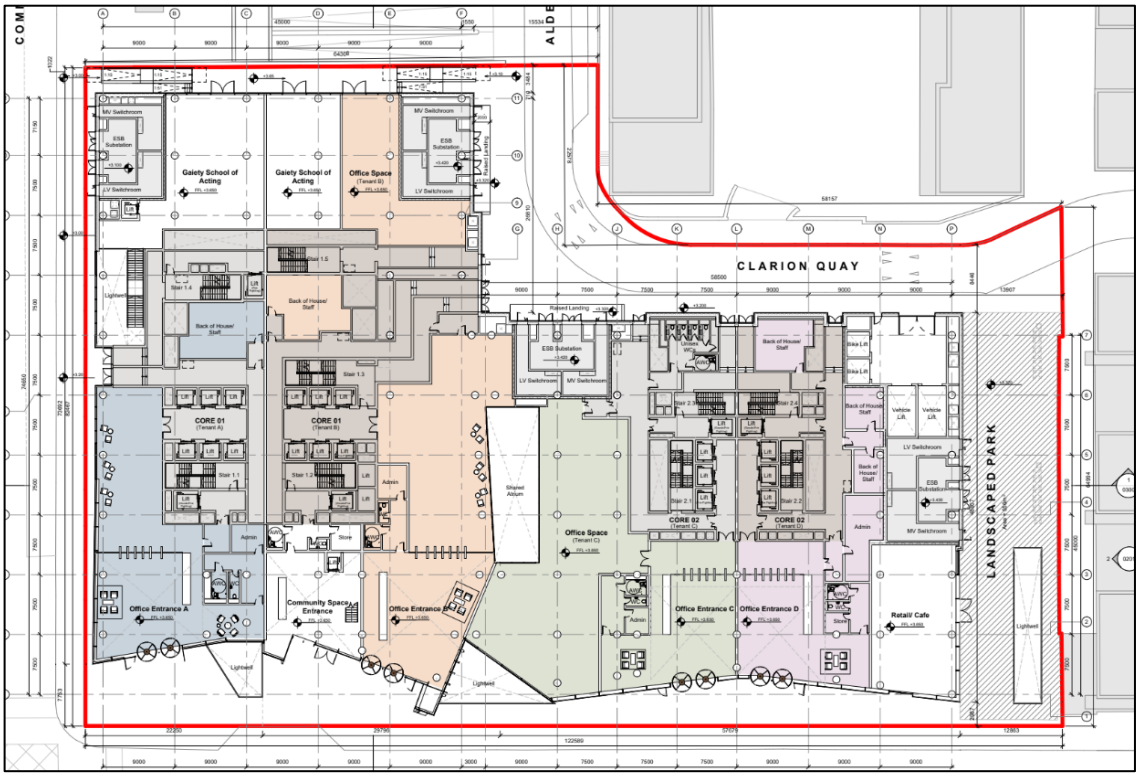

Figure 3.1 *Ground floor plan for Option 2 (Source: HJL Architects, Drawing Ref. 1NWQ-HJL-AX-00-DR-A-0100)*

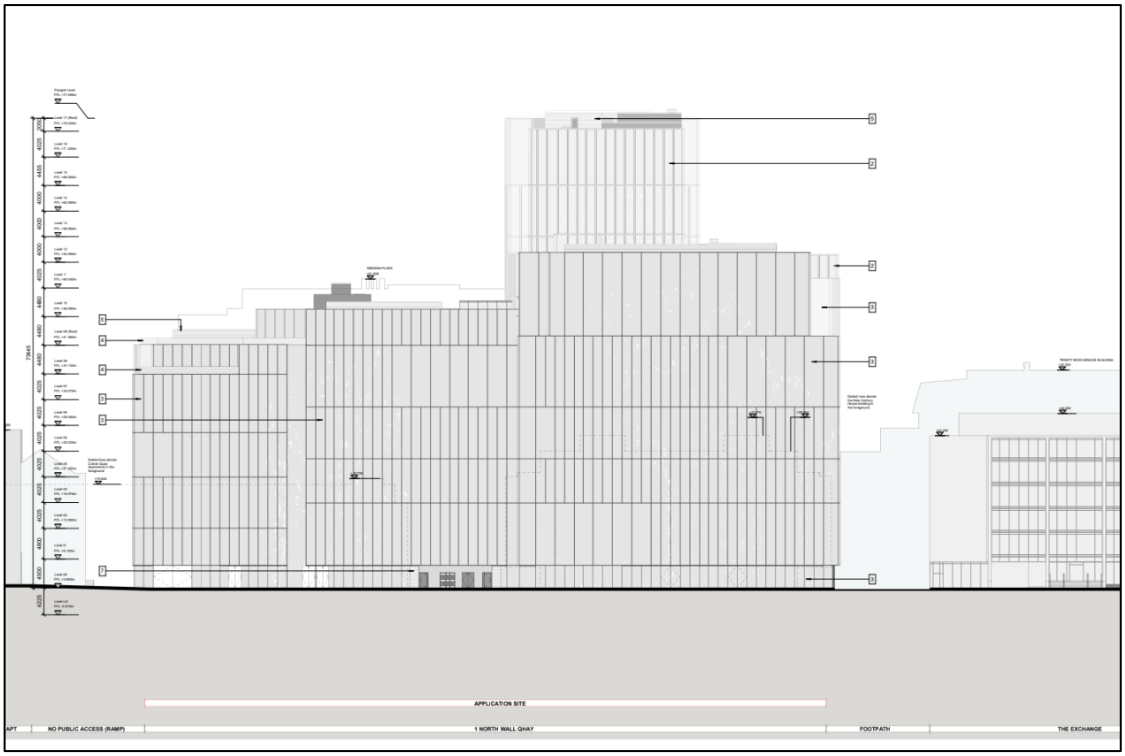

Figure 3.2 *Northern Elevation of Option 2 (Source: HJL Architects, Drawing Ref. 1NWQ-HJL-AX-ZZ-DR-A-0200)*

3.4.3 Chosen Option

The project team evaluated the feasibility and advantages of moving forward with the options detailed in Sections 3.4.1 and 3.4.2. This included reviewing the architectural plans, financial implications, producing a Whole Lifecycle Carbon Assessment (WLCA) and the overall suitability of the options.

In respect of environmental effects, Table 3.1 below outlines where an option is more preferred over another and where the preference in neutral.

Table 3.1 *Summary of route preference for each environmental factor*

Environmental Factor	Phase	Option 1	Option 2
Human Health and Populations	Demolition and Construction		
	Operational		
Land, Soils, Geology and Hydrogeology	Demolition and Construction		
	Operational		
Hydrology	Demolition and Construction		
	Operational		
Biodiversity	Demolition and Construction		
	Operational		
Air Quality	Demolition and Construction		
	Operational		
Climate	Demolition and Construction		
	Operational		

Noise and Vibration	Demolition and Construction		
	Operational		
Archaeology and Cultural Heritage	Demolition and Construction		
	Operational		
Traffic and Transportation	Demolition and Construction		
	Operational		
Material Assets - Waste	Demolition and Construction		
	Operational		
Material Assets - Utilities	Demolition and Construction		
	Operational		
Landscape	Demolition and Construction		
	Operational		

Less Preferred (relatively greater potential environmental impact)	**Neutral** (relatively neutral potential environmental impact)	**More Preferred** (relatively lessor potential environmental impact)

The Whole Lifecycle Carbon Assessment (WLCA) produced by BPC estimates the embodied carbon emissions and operational carbon emissions associated with the construction and operation of the new building and the 17 storey extend option. The results show the difference in whole life-cycle carbon emissions between a new build and 17 storey extend option to be very small at approximately 3% - 8% less for the refurbished option depending on the operational energy scenario.

As noted in the WLCA, carbon is only one of many considerations that need to be taken into account when assessing the merits of a new build versus an extend option. Factors such as energy efficiency standards, sustainable design, density, space utilisation and adaptability are other key benefits of the New Build option (Option 2).

Given the nature of the 17 storey extend option, an off-site site compound would be required to facilitate it. It is likely that with the new build option a site compound can be contained within the site.

Ultimately, after careful analysis and comparison between Option 1 and Option 2, it was determined that Option 1, although having certain construction phase environmental advantages was not the optimal choice. Factors such as additional office space achieved with Option 2, evolving design preferences and financial implications influenced this decision. The selected option, Option 2 Chosen Design, was deemed to better align with the project's current goals and objectives.

3.5 ALTERNATIVE PROCESSES (TECHNOLOGIES)

The EPA's Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022) 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 overall scale of development proposed and

the resulting impact on neighbouring and residential amenities. Where relevant, alternative processes are considered in each Chapter of the EIAR.

The following passive strategies will be implemented to reduce the energy consumption for the proposed development:

- Low air permeability
- High performance u-values
- Limiting thermal bridging
- Optimisation of solar gain
- Maximising daylight

Various renewable energy sources have been explored as part of the design process. The proposed renewable energy sources are:

Air Source Heat Pumps (ASHP) (Multifunctional [4-pipe] heat pumps.)

ASHP's take heat from the air outside and release it inside. The technology works based on a vapor-compression refrigeration cycle. ASHPs supply more energy than they consume, by using this vapour compression cycle to extract heat from their surroundings and release it elsewhere (inside). Heat pump systems can have SCOPs greater than 4 meaning that they will supply 4 times more heat energy than the electricity they consume over the course of a year. Under the NEAP assessment methodology the difference between the primary energy consumed and the primary energy delivered by a heat pump can be considered renewable.

An air source heat pump system is one of the most efficient solutions to supply heating hot water for this development. The proposed design uses multifunctional (4-pipe) heat pumps for generating LTHW. (Water-to-water heat pumps linked to the LTHW circuit will generate DHW.)

Photovoltaics (PV)

PV Cell technology has been incorporated into the proposed development design at roof level. PV Cells technology involves the conversion of the sun's energy into electricity. This electricity can be used to offset electricity consumption from the grid or it could be used to heat hot water through an electric immersion if electricity demand were low.

Alternative renewable energy technologies that were considered but are not proposed are:

Ground Source Heat Pump

Ground source heat pumps (GSHPs) use the same principle as air source heat pumps but instead of taking heat form the air they take heat from the ground. The is known as ground heat exchange (GHE) or "geo-exchange". The primary advantage of ground heat exchange over air heat exchange is that higher annual efficiencies can typically be achieved due to fairly constant moderate temperatures in the ground. The major issue with a ground-exchange system for this development is that they require a balanced heating and cooling load in order to operate efficiently over a sustained period of time. Balanced heating and cooling conditions do not exist for this development. It is heating dominated. GSHPs are considerably more expensive to install. Due to the unbalanced load affecting the long-term operating efficiency there is unlikely to be an attractive return on investment (ROI).

Biomass Heating

Biomass heating works on the principle that the combustion of wood chip or pellets can create heat for space heating and hot water loads. The combustion of biomass could be done in a dedicated biomass boiler or a CHP (combined heat and power) plant. This technology requires substantial space allowance, access for delivery trucks, a buffer vessel and considerable space for fuel storage. The system also requires regular maintenance to remove ash, etc. Additionally, the use of biomass calls for a continuous local supply of suitable fuel to be truly sustainable. Concerns exist over the level of NOx, SOx and other particulate emissions from burning biomass, particularly in urban areas.

Solar Hot Water Collectors

Solar hot water collectors (SHWC) utilise solar radiation to heat water for use in buildings. Solar collectors are typically designed to meet a development's base domestic hot water load. For office developments, the hot water demand is usually a relatively low proportion of the overall heating demand, unless there are large changing facilities with showers. Even so, a SHWC system would require substantial roof space to generate enough hot water for a development of this scale. This would also compete with Photovoltaics (PV) which will be more efficient at heating water if coupled with an electric water heater.

Small Scale Wind (Micro Turbines)

Micro wind turbines can be fitted to the roof of a building but in urban environments, it is difficult to achieve consistent high wind speeds with laminar flow that would make the operation of turbines viable. Vertical axis wind turbines (VAWT) are generally the most suitable for urban applications. For the proposed development VAWTs would have to be placed close to the edges of the roof. This would interfere with the window cleaning systems. There are also obvious aesthetic and noise issues to contend with.

3.6 ALTERNATIVE MITIGATION

The EIA process for the proposed development involved a team of specialists, each with expertise in a specific aspect of the environment. For each aspect of the environment, each specialist has considered the existing environment, likely impacts of the proposed development and reviewed feasible mitigation measures to identify the most suitable measures appropriate to the environmental setting of the proposed development. In making a decision on the most suitable mitigation measure the specialist has considered relevant guidance and legislation. In each case, a comparison of environmental effects was made, and the specialist has reviewed the possible mitigation measures available and considered the use of the mitigation in terms of the likely residual impact on the environment. The four established strategies for mitigation of effects have been considered: avoidance, prevention, reduction and offsetting (not required in this development). Mitigation measures have also been considered based on the effect on quality, duration of impact, probability and significance of effects.

The selected mitigation measures for the proposed development are outlined in each of the EIA Report Chapters 4-14. These measures have been specifically chosen to address the potential environmental impacts of the proposed development and to minimize any adverse effects on the environment. By considering a range of mitigation measures and strategies, the specialist team has sought to ensure that the proposed development is as environmentally sustainable and responsible as possible.

3.7 CONCLUSIONS

Based on the assessment of reasonable alternatives (in relation to scale, design, technology, mitigation) relevant to the proposed development and its specific characteristics as set out in this chapter, the selected site is considered to be a suitable location for the proposed development from both an environmental perspective and a planning perspective. In terms of processes/technologies, the applicant has selected processes/technologies based on many factors including technical feasibility, environmental impact, efficiency, security, reliability, and cost.

The site is currently zoned for *City Centre* use and the proposed development is line with keeping with the policies and objectives of the Dublin City Development Plan 2022-2028.

The siting of the proposed facility has been carefully selected based on a suitably comprehensive assessment of reasonable alternative site locations, designs and processes. The proposed development will enhance the utilisation of the site. The proposal will allow the development potential of the site to be maximised while improving natural screening through landscaping treatments within the development site and along the site perimeter.

In conclusion it is considered that the proposed site has significant capacity for development and is highly suitable for the proposed development.

3.8 REFERENCES

Environment Protection Agency, *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (2022)

Department of Housing, Planning and Local Government, *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* (2018)

European Commission (EC), *Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report* (2017).