- Archaeological monitoring of earthmoving works.

The archaeological works will be carried out under the Ministerial Consent. The consent application will be supported by detailed method statements compiled by the integrated Dublin Central conservation team (comprising a conservation architects, structural conservation engineers, architects and archaeologists). This will include an archaeological strategy for the works for all phases the development i.e., site preparation, demolition and construction. The Minister may attach further conditions in the granting of consent, including conditions requiring archaeological excavation.

Where the Minister has granted a consent under Section 14 of the Act, no other consent or licence under any provision of the National Monuments Act, including an excavation licence, is required for any archaeological work or activity, (the other works in Site 4 not bounding the National Monument will require an archaeological licence).

General Mitigation

The following archaeological mitigation measures will be carried out within Site 4: -

- **Monitoring**

  Archaeological monitoring will take place at the preconstruction, site preparation and enabling works / early stages of construction and where any preparatory ground reduction works are required. This will be carried out in order to establish the presence or absence, as well as the nature and extent, of any archaeological deposits, features or sites that may be present, where ground investigation and earth-moving works are taking place. This will include the survey and recording of any surviving 18th century structures that may be revealed.

  It is anticipated that the following works will be monitored as required: -

  - *Pre-Demolition Investigation Works*

    Including but not limited to the monitoring of: -

    - Site investigation works.
    - Opening up works at basement or ground levels.
    - Site survey of existing basements in association with the conservation contractor (as required) to record any early 18th century fabric that might be identified.
    - Recording of basement prior to infilling.

  - *Demolition & Enabling Works*

    Including but not limited to the monitoring of: -

    - Temporary enabling works where they will require opening up works at ground level.
    - Strip footings associated with retention of structures and adjacent basements.
    - Post-demolition grubbing out of foundations and substructures.
    - All earthmoving works.

- **Test Excavation**

  Given that the development is within the ZAP for Dublin (DU018-020), archaeological test excavation will be required.

  The testing will be carried out during the post demolition phase in areas where it is possible and safe to do so. It will be strategic and focused in areas where there are no existing basements. The testing will establish the nature and the level of disturbance across the site.

  Following the implementation of an approved programme of mitigation, any impact on archaeological soils, finds or features identified within Site 4 will be resolved in consultation with the relevant authorities.

- **Excavation**

  In the event that archaeological features or deposits exist, the mitigation for development impact will involve an excavation which will be integrated into the early phases of the site's development programme.

  Archaeological excavation will ensure that this removal is systematically and accurately recorded, drawn and photographed, to achieve a full descriptive paper and digital archive, thereby adding to the archaeological record and to the knowledge of a specified area.

  The results will be compiled in detailed reports which will be submitted to DCC and to DHLGH and the NMI in compliance with the awarding of a licence.

- **Licencing**

  Archaeological monitoring and excavation will be carried out under licence from the DHLGH and the NMI, and will ensure the full recognition of, and the proper excavation and recording of all archaeological soils, features, finds and deposits which may be disturbed below the ground surface.

  All mitigation measures will be carried out in accordance with an approved method statement which will be agreed in advance with the DCC City Archaeologist.

- **General**

  These proposed strategies do not prejudice any further recommendations made by the Department, who may seek additional information or consider alternative strategies.

  National Monuments Legislation (as amended) states that in the event of the discovery of archaeological finds or remains, the NMI should be notified immediately. Provision must be made to allow for, and fund any, archaeological work that may be needed if any remains should be noted during ground preparation works or during construction. As described above, if features are revealed, the area will need to be investigated, allowing no further development to take place until the site is fully identified, recorded and excavated or, alternatively, avoided.

  All archaeological issues shall be resolved to the satisfaction of the DHLGH and the NMI.

Site 5

<u>General Mitigation</u>

The following archaeological mitigation measures will be carried out within Site 5: -

- **Monitoring**

  Archaeological monitoring will take place at the preconstruction, site preparation and enabling works/ early stages of construction and where any preparatory ground reduction works are required. This will be carried out in order to establish the presence or absence, as well as the nature and extent, of any archaeological deposits, features or sites that may be present, where ground investigation and earth-moving works are taking place.

  It is anticipated that the following works will be monitored as required: -

  - *Pre-Demolition Investigation Works*

    Including but not limited to the monitoring of: -

    - Site investigation works.
    - Opening up works at basement or ground levels.
    - Site survey of existing basements in association with the conservation contractor (as required) to record any early 18th century fabric that might be identified.
    - Recording of basement prior to infilling.

  - *Demolition & Enabling Works*

Including but not limited to the monitoring of: -

- Temporary enabling works where they will require opening up works at ground level.
- Strip footings associated with retention of structures and adjacent basements.
- Post-demolition grubbing out of foundations and substructures.
- All earthmoving works.

- **Test Excavation**

  Given that the development is within the ZAP for Dublin (DU018-020), archaeological test excavation will be required. The testing will be carried out during the post demolition phase in areas where it is possible and safe to do so. It will be strategic and focused in areas where there are no existing basements. The testing will establish the nature and the level of disturbance across the site.

  Following the implementation of an approved programme of mitigation, any impact on archaeological soils, finds or features identified within Site 4 will be resolved in consultation with the relevant authorities.

- **Excavation**

  In the event that archaeological features or deposits exist, the mitigation for development impact will involve an excavation which will be integrated into the early phases of the site's development programme.

  Archaeological excavation will ensure that this removal is systematically and accurately recorded, drawn and photographed, to achieve a full descriptive paper and digital archive, thereby adding to the archaeological record and to the knowledge of a specified area.

  The results will be compiled in detailed reports which will be submitted to DCC and to DHLGH and the NMI in compliance with the awarding of a licence, or in the case of the National Monument, Ministerial Consent to excavate.

- **Licencing**

  Archaeological monitoring and excavation will be carried out under licence from the DHLGH and the NMI, and will ensure the full recognition of, and the proper excavation and recording of all archaeological soils, features, finds and deposits which may be disturbed below the ground surface.

  All mitigation measures will be carried out in accordance with an approved method statement which will be agreed in advance with the DCC City Archaeologist.

- **General**

  These proposed strategies do not prejudice any further recommendations made by the Department HLGH, who may seek additional information or consider alternative strategies.

  National Monuments Legislation (as amended) states that in the event of the discovery of archaeological finds or remains, the NMI should be notified immediately. Provision must be made to allow for, and fund any, archaeological work that may be needed if any remains should be noted during ground preparation works or during construction. As described above, if features are revealed, the area will need to be investigated, allowing no further development to take place until the site is fully identified, recorded and excavated or, alternatively, avoided.

  All archaeological issues shall be resolved to the satisfaction of the DHLGH and the NMI.

Operational Stage

No further archaeological testing, excavation or monitoring works will be necessary during the operation phase of the development (i.e. Site 3, Site 4 & Site 5).

18.2.13 Risk Management (Major Accidents & Disasters) (Chapter 17)

Construction Phase

The mitigation measures relevant to each environmental factor outlined in chapters 5 – 16 of the EIAR, as well as in the Construction Management Plan, will be implemented during the construction phase and will collectively mitigate the risk of major accidents and disasters during this time.

The construction phase will be carried out in accordance with best practice site management measures relating to health and safety and emergency response. These measures are described in the Outline Construction Management Plan, prepared by Waterman Moylan Consulting Engineers.

Operational Stage

No mitigation or monitoring measures are proposed specific to reducing the risk of major accident / disaster during operation.

19 ENVIRONMENTAL INTERACTIONS & CUMULATIVE IMPACT

19.1 Introduction

This Chapter of the EIAR identifies the principal interactions between the potential impacts of the environmental factors identified in Chapter 5 to 17 inclusive.

The principal interactions are summarised below, under Table 19.1, and further discussed in Section 19.2 of this Chapter.

The predicted impacts identified in Chapters 5 – 17 have taken into account the principal interactions listed below and associated mitigation measures.

The cumulative impacts arising from the interaction of impacts identified below, is also outlined in this Chapter.

This chapter has been prepared by Stephen Little, Managing Director and Michael O'Sullivan, Senior Planner, of Stephen Little & Associates. Stephen has 29 years' professional experience of town planning in Ireland, is a Corporate Member of both the Irish Planning Institute and the Royal Town Planning Institute and holds a Diploma in EIA Management (UCD). Michael has 7 years' professional experience in the planning in both the public sector and private consultancy in Ireland, has a MPlan – Master in Planning & Sustainable Development and is a Corporate Member of the Irish Planning Institute.

	Population & Human Health	Biodiversity	Land, Soils & Geology	Water	Climate (Air Quality & Climate Change)	Climate (Sunlight & Daylight)	Air (Noise & Vibration)	Landscape & Visual Impact	Material Assets (Transport)	Material Assets (Waste)	Cultural Heritage (Archaeological)	Cultural Heritage (Architectural)
Population & Human Health		X	✓	✓	✓	✓	✓	✓	✓	X	X	X
Biodiversity	X		X	✓	X	X	✓	✓	X	X	X	X
Land, Soils & Geology	✓	✓		✓	✓	X	✓	X	✓	✓	X	X
Water	✓	✓	✓		X	X	✓	X	X	✓	X	X
Climate (Air Quality & Climate Change)	✓	X	✓	X		X	X	X	✓	X	X	X
Climate (Sunlight & Daylight)	X	X	X	X	X		X	X	X	X	X	X
Air (Noise & Vibration)	✓	X	X	X	X	X		X	X	X	X	X
Landscape & Visual Impact	✓	✓	X	X	X	X	X		✓	X	✓	✓
Material Assets (Transport)	✓	✓	X	X	✓	X	✓	X		✓	X	X
Material Assets (Waste)	✓	X	✓	X	X	X	X	X	✓		X	X
Cultural Heritage (Archaeological)	X	X	X	X	X	✓	✓	✓	X	X		✓
Cultural Heritage (Architectural)	X	X	X	X	X	X	X	X	X	X	X	

Where there is an interaction = ✓ No Interaction = **X**

Table 19.1: Matrix of Interactions between Environmental Factors (During Construction and Operational Phases)

19.2 Interactions

19.2.1 Population and Human Health (Chapter 5)

Land, Soils & Geology

The interaction between Human Health on Soils resulted in baseline soils testing to ensure that there was no potential for spread of contaminant substances due to excavation works, or ground failure.

Water

The interaction between Human Health on Water resulted in baseline water investigations to ensure that there was no potential for contamination of water sources, no flooding risks, or risks of diminished potable water supply.

Climate (Air Quality & Climate Change)

The interaction between Human Health on Air Quality has resulted in controlled construction measures and traffic management plans to curtail air and dust emissions.

Climate (Sunlight & Daylight)

The interaction between Human Health on Sunlight has affected the design of the buildings to reduce sunlight depravation for both residents living in the area and residents living within the proposed development.

Air (Noise & Vibration)

The interaction between Human Health on Noise has resulted in controlled construction measures, traffic management plans and social noise management plans to curtail noise emissions.

Material Assets (Transportation)

The interaction of Human Health on Traffic has resulted in baseline traffic assessments and traffic management plans to ensure that stresses associated with longer waiting times and un-safe junctions do not pose a significant threat.

19.2.2 Biodiversity (Chapter 6)

Biodiversity receptors interact with other environmental items as outlined in Chapter 6 of this EIAR, these are summarised as follows: -

Water

Interactions between water and biodiversity including habitats, flora and fauna could potentially occur through impacts on water quality in the River Liffey either arising from an accidental pollution event during construction or during operation. This interaction has the potential to result in significant effects on hydrologically connected habitats such as those designated for in Dublin Bay European sites, and the sensitive fauna that rely on these habitats. Given the reasons discussed within section 6.5 of Chapter 6 and information based on the Hydrological and Hydrogeological qualitative risk assessment (AWN, 2021), negative effects on biodiversity as a result of the proposed development are not predicted to be significant at any geographic scale.

Air (Noise & Vibration)

Interactions between noise and vibration and sensitive fauna, i.e. breeding birds, could potentially occur owing to increased noise and vibration levels during construction works. This interaction has the potential to result in significant effects on sensitive fauna. Following the implementation of mitigation measures outlines in Section 6.7.3 of Chapter 6, effects on fauna arising from noise and vibration are not predicted to be significant at any geographic scale.

Landscape & Visual Impact Assessment

There are pockets of low value vegetation due for removal within the proposed development site. As a result, there are no effects predicted on biodiversity due to the lack of habitats within the Proposed Development site. Interactions between landscaping and biodiversity could occur due to the enhancement measures proposed within the landscaping design, providing benefits to biodiversity and residents in a predominantly urbanised environment.

19.2.3 Land, Soils and Geology (Chapter 7)

The interactions between Chapter 7 (Lands, Soils and Geology) and the other chapters of the EIAR are set out below: -

Population & Human Health

Dust from the site and from soil spillages on the existing road network around the site may impact human health, especially during dry conditions. Dampening down measures with water sprays will be implemented during periods of dry weather to reduce dust levels arising from the development works.

Biodiversity

Accidental oil or diesel spillages from construction plant and equipment may impact local flora and fauna. Such spills will be mitigated in accordance with Chapter 7 of this EIAR.

Water

Accidental oil or diesel spillages from construction plant and equipment, in particular at refuelling areas, may result in oil contamination of the soils and underlying geological structures, including surface water and groundwater. Measures will be implemented throughout the construction stage to prevent contamination of the soil and adjacent watercourses from oil and petrol leakages.

Climate (Air Quality & Climate Change)

Dust from the site and from soil spillages on the existing road network around the site may impact air quality, especially during dry conditions. Dampening down measures with water sprays will be implemented during periods of dry weather to reduce dust levels arising from the development works. Air Quality will be controlled and monitored as set out in Chapter 9 of this EIAR.

Air (Noise & Vibration)

Heavy machinery used for excavations may impact on noise and vibration. Both will be controlled and monitored as set out in Chapter 12 of this EIAR.

Waste Management

Excess soil excavated during construction works, including any potential contaminated soils, will be managed and disposed of in approved locations as provided for in this EIAR.

Material Assets (Transport)

Excess soil excavated during construction works for Dublin Central will be transported by road for disposal in approved locations as provided for in this EIAR. Movements of construction traffic will be managed in accordance with the Construction Traffic Management Plan.

19.2.4 Water (Chapter 8)

The interactions between Chapter 8 (Water) and the other chapters of the EIAR are set out below: -

Population & Human Health

There is a risk of pollution of groundwater and water courses by accidental spillage of foul effluent during connections being made to live sewers, which could impact human health. This risk will be mitigated in accordance with Chapter 8 of this EIAR.

Biodiversity

There is a risk of pollution of groundwater and water courses by accidental spillage of foul effluent during connections being made to live sewers, which could affect local flora and fauna. Such spills will be mitigated in accordance with Chapter 8 of this EIAR.

Land, Soils & Geology

There is a risk of pollution of groundwater by accidental spillage of foul effluent during connections being made to live sewers. This risk will be mitigated in accordance with Chapter 8 of this EIAR.

Air (Noise & Vibration)

Heavy machinery used for excavations to facilitate watermains, drainage and attenuation may impact on noise and vibration. Both will be controlled and monitored as set out in Chapter 12 of this EIAR.

Waste Management

Excess soil excavated during construction works to facilitate watermains, drainage and attenuation, including any potential contaminated soils, will be managed and disposed of in approved locations as provided for in this EIAR.

19.2.5 Climate (Air Quality and Climate Change) (Chapter 9)

Air quality does not have a significant number of interactions with other topics.

Population & Human Health

The most significant interactions are between population and human health and air quality. An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is short to long term, negative and imperceptible with respect to human health.

Land, Soils and Geology

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and land and soils in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils.

Material Assets (Transportation)

Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on the surrounding road network. In this assessment, the impact of the interactions between traffic and air quality are considered to be imperceptible.

No other significant interactions with air quality and climate have been identified.

19.2.6 Climate (Sunlight & Daylight) (Chapter 10)

No potential impacts from other chapters of this EIAR were considered to have the potential to have associated sunlight and daylight impacts.

19.2.7 Air, Noise and Vibration (Chapter 11)

General

In compiling this impact assessment, reference has been made to the project description provided by the project co-ordinators, project drawings provided by the project architects and information relating to mechanical plant provided by the mechanical engineers. Noise emission sources from the proposed development during the construction and operational phases will be from traffic. The noise impact assessment has been prepared in consultation with the design team and traffic engineers. Refer to the relevant chapters for additional information.

Human Health

The potential impacts on human beings in relation to the generation of noise and vibration during the construction phases are that high levels of noise and vibration could cause nuisance to people in nearby sensitive locations. Implementation of the mitigation measures set out and adherence to good practice noise reducing measures will ensure that the residual impact on human health will be lessened and impacts will be short-term in nature

Similarly, during the operational phase, designing plant selections to achieve the relevant noise criteria will result in a residual impact that is imperceptible to people in nearby noise sensitive locations. External noise sources acting on the development have been assessed and mitigation to ensure internal noise levels achieve the relevant noise criteria.

19.2.8 Landscape and Visual Impact (Chapter 12)

Introduction

All environmental factors are inter-related to some extent, these relationships can range from the tenuous to highly complex. Landscape and visual impacts often interact with and/or interrelate to the following topics for the proposed development.

Biodiversity

An interaction between biodiversity and landscape and visual impact during the operation phase of the proposed development is identified.

There is little of ecological interest present within the application site, so during construction there is little potential for loss of features of value. Once operational, the introduction of street trees, planted swales and courtyards in addition to green roofs is likely to have a positive effect on the ecological potential of the site and its setting.

Cultural Heritage

A potential interaction between cultural heritage and landscape and visual impact during both the construction and operational phases of the proposed development is identified.

The area around the site of the proposed development is one of cultural significance, including the surrounding streets and their historical significance and buildings and other elements in these streets. Short term effects derived from hoardings located along the boundary of the application site during construction in addition to cranes and scaffolding have the potential to affect how the cultural significance of the area is perceived. During the operational phase the proposed buildings and changes to the public realm also have the potential to affect the perception of cultural heritage. The design of buildings, landscape and the selection of materials have the potential to contribute to the understanding of, engagement with and perception of the cultural heritage of the area.

Population and Human Health

An interaction between the population and human health and landscape and visual impact during both the construction and operational phase of the proposed development is identified.

Adverse, short term visual impacts will arise for visual receptors located close to or adjoining the application site during construction. These effects will derive from the presence of scaffolding, cranes, hoarding and materials. Once operational, the proposed development will contribute to the structure and functionality of this area of the City. This is principally due to the transformation of disused parts of the development site into useful development and publicly accessible civic spaces. Enhancements to landscape and visual amenity have the potential to positively impact on population and human health by increasing footfall to the area.

Transport

An interaction between transport and landscape and visual impact during both the construction and operational phases of the proposed development is identified.

Adverse, short term impacts will arise for receptors located close to or adjoining the application site during construction. These effects will derive from the increased movement of vehicles both using the public road network delivering and removing materials and within the application site. Once operational, positive effects such as pedestrian and cyclist movements and activity deriving from the proposed development will enliven and animate the streetscape.

19.2.9 Material Assets (Transportation) (Chapter 13)

The interactions between Chapter 13 Material Assets (Transport) and the other chapters of the EIAR are set out below: -

Population and Human Health

Traffic diversions during the Construction Stage could result in a temporary slight negative impact on population and human health. Diversions will be managed in accordance with the Construction Traffic Management Plan.

Lands, Soil & Geology

Material excavated during the construction of the will be transported by road for disposal in approved locations as provided for in Chapter 7 of this EIAR. Movements of construction traffic will be managed in accordance with the Construction Traffic Management Plan.

Climate –(Air Quality & Climate Change)

The generation of traffic during the Construction Stage has the potential to impact on Air Quality. Air Quality will be controlled and monitored as set out in Chapter 9 of this EIAR.

Air (Noise and Vibration)

The traffic generated during the Construction Stage has the potential to impact on noise and vibration. Both will be controlled and monitored as set out in Chapter 12 of this EIAR.

Material Assets (Waste)

Excess material excavated during construction works for Dublin Central will be transported by road for disposal in approved locations as provided for in this EIAR. Movements of construction traffic will be managed in accordance with the Construction Traffic Management Plan.

19.2.10 Material Assets (Waste) (Chapter 14)

Dublin Central Masterplan

Adherence to the mitigation measures outlined in Section 14.6 in chapter 14 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 Construction &Demolition Waste Management Plan and during the operational phase in accordance with the Operational Waste Management Plan 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.

Land, Soils & Geology

During the construction phase excavated soil, stone, clay and made ground (c. 163,490m^3) will be generated from the excavations required to facilitate site levelling and construction of foundations. It is estimated that all of excavated material will need to be removed offsite due to limited opportunities for reuse. Where material has to be taken off site it will be taken for reuse or recovery, where practical, with disposal as last resort. Adherence to the mitigation measures in Chapter 14 and Construction &Demolition Waste Management Plan in Appendix 14.1 will ensure the effect is long-term, imperceptible and neutral.

Material Assets (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 13 Material Assets Transportation. Provided the mitigation measures detailed in Chapter 13 and the requirements of the Operational Waste Management Plan (included as Appendix 14.2) are adhered to, the effects should be short to long-term, imperceptible and neutral.

Population & Human Health

The potential impacts on human beings in relation to the generation of waste during the demolition, 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 Construction & Demolition Waste Management Plan and Operational Waste Management Plan, will ensure appropriate management of waste and avoid any negative impacts on the local population. long-term, imperceptible and neutral.

Site 3, 4 & 5

Adherence to the mitigation measures outlined in Section 14.6 in chapter 14 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 Construction & Demolition Waste Management Plan and during the operational phase in accordance with the Operational Waste Management Plan 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.

Land, Soils & Geology

During the construction phase excavated soil, stone, clay and made ground (Site 3: c. 15,165m3, Site 4: c.132m^3 & Site 5: 5,593m^3) will be generated from the excavations required to facilitate site levelling and construction of foundations. It is estimated that all of the excavated material will need to be removed offsite due to the limited opportunities for reuse onsite. Where material has to be taken off site it will be taken for reuse or recovery, where practical, with disposal as last resort. Adherence to the mitigation measures in Chapter 14 and the Construction & Demolition Waste Management Plan in Appendix 14.1 will ensure the effect is long-term, imperceptible and neutral.

Material Assets (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 13 Material Assets Transportation. Provided the mitigation measures detailed in Chapter 13 and the requirements of the Operational Waste Management Plan (included as Appendix 14.2) are adhered to, the effects should be short to long-term, imperceptible and neutral.

Population & Human Health

The potential impacts on human beings in relation to the generation of waste during the demolition, 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 Construction &Demolition Waste Management Plan and Operational Waste Management Plan, will ensure appropriate management of waste and avoid any negative impacts on the local population. long-term, imperceptible and neutral.

19.2.11 Cultural Heritage (Architectural) (Chapter 15)

The existing Cultural Heritage character of retained historic building fabric within and historic building fabric external to the masterplan site is identified and informed by interactions with the following chapters of the EIAR: -

Climate (Sunlight & Daylight)

The interaction between cultural heritage and sunlight/ daylight has influenced the design of Sites 3, 4 and 5 in particular to reduce consequential daylight impacts for historic building fabric and historic streetscapes in the vicinity of the combined development.

Air (Noise & Vibration)

Retained structures of significance within the combined development Sites 3, 4 and 5, and in particular immediately adjoining historic buildings have benefited from a comprehensive review of the likely effects of vibration due to heavy machinery at demolition, excavation and construction stages, and mechanisms to control and monitor these effects, as cited in the various construction and management Chapters 3.1 -3.4 of this EIAR.

Landscape and Visual Impact

Operational stage impacts for the setting of retained historic fabric within and historic fabric enclosing Sites 3, 4 and 5 are demonstrated in Chapter 12 of the EIAR, following consideration and tempering of impacts at design stage.

Cultural Heritage (Archaeological)

Chapter 16 of the EIAR has influenced consideration of impacts for the inherent and adjoining architectural cultural heritage of Sites 3, 4 and 5 insofar as its predictions for impacts at excavation stage, which have in turn informed methodologies for protection of architectural heritage, expanded at design stage and reflected in mitigations cited in the various construction and management Chapters 3.1 -3.4 of this EIAR.

19.2.12 Cultural Heritage (Archaeological) (Chapter 16)

No significant interactions with Archaeology are envisioned as the mitigation measures proposed are incorporated into the design, construction, or operation of the proposed development. Archaeological monitoring is recommended for all earthmoving works required within the Dublin Central Masterplan area which will have the potential to reveal in-situ archaeological remains. The implementation of the archaeological mitigation measures during site preparation and construction works will ensure that all interactions are mitigated appropriately.

19.2.13 Risk Management (Major Accidents and Disasters) (Chapter 17)

As outlined in sections 17.5.1.6 and 17.5.1.7 above, no likely risks of a major accident / disaster occurring are identified during construction stage. A medium risk of major accident / disaster in respect of the proposed development during the operational phase. No cumulative effects are identified.

19.3 Cumulative Impacts

Where cumulative impacts were considered to arise, these have been outlined in the relevant Chapters of this EIAR. The below sections outline the cumulative impacts as raised in each relevant Chapter.

19.3.1 Population and Human Health (Chapter 5)

19.3.1.1 Proposed Development – Site 3, 4 & 5

Construction Stage

The cumulative impact of other potential impacts on human health from air quality, noise quality and traffic have been incorporated into the various models and assessments that have contributed to section 5.5.1 in chapter 5 of this EIAR.

Operational Stage

The cumulative impact of other potential impacts on human health from air quality, noise quality and traffic have been incorporated into the various models and assessment that have contributed to section 5.5.2 in chapter 5 of this EIAR.

19.3.2 Biodiversity (Chapter 6)

19.3.2.1 Dublin Central Masterplan

The Dublin Central Masterplan site is currently zoned as Z5 "City / Town / Village Centre, Central Area" with the zoning objective *"to consolidate and facilitate the development of the central area, and to identify, reinforce, strengthen and protect its civic design character and dignity"* within the Dublin City Development Plan 2016 – 2022.

This section of the chapter assesses the potential for any other Proposed Developments to act cumulatively with the development of the Dublin Central Masterplan, to give rise to likely significant effects on biodiversity.

Based on a search of active or recent planning applications in the immediate environs of the Dublin Central Masterplan site[1], most applications relate to minor additions or amendments to existing buildings, including installation of platform lifts, improved access facilities etc. The exception to this is the planning application directly east of the site, on Moore Lane / Parnell Street, which will consist of the provision of additional nine bedrooms to the existing hotel. Planning permission for construction of the building was granted in July 2019, and works on this development are currently ongoing.

Potential cumulative impacts may arise during construction and operation, as a consequence of the development of the Dublin Central Masterplan acting in-combination with other plans and projects, on water quality in the downstream surface water environment, and on disturbance and habitat loss to birds.

There is potential for cumulative impacts to arise with other local developments that would also result in increased noise, vibration, and human presence. However, as any disturbance effects from other such local developments are likely to be or a minor nature, temporary, localised and over a short-duration, they are not likely to cumulatively affect the local breeding bird populations in conjunction with the implementation of the Dublin Central Masterplan.

[1] Planning applications accessed via myplan.ie on 23 February 2021. Only planning applications that have been granted permission within the last five years were considered.

Considering the predicted impacts associated with the implementation of the Dublin Central Masterplan, the mitigation measures proposed to protect the local biodiversity resource and the receiving environment, and the protective policies and objectives on the land-use plans that will direct future development locally, significant cumulative negative effects on biodiversity are not predicted.

19.3.2.2 Proposed Development – Site 3, 4 & 5

The Dublin Central Masterplan site, and subsequently the Proposed Development, is currently zoned as Z5 "City / Town / Village Centre, Central Area" with the zoning objective "to consolidate and facilitate the development of the central area, and to identify, reinforce, strengthen and protect its civic design character and dignity" within the Dublin City Development Plan 2016 – 2022.

This section of the chapter assesses the potential for any other Proposed Developments to act cumulatively with the development of the Proposed Development, to give rise to likely significant effects on biodiversity.

Based on a search of active or recent planning applications in the immediate environs of the Dublin Central site, most applications relate to minor additions or amendments to existing buildings, including installation of platform lifts, improved access facilities etc. The exception to this is the planning application directly east of the site, on Moore Lane / Parnell Street, which will consist of the provision of additional nine bedrooms to the existing hotel. Planning permission for construction of the building was granted in July 2019 and works on this development are currently ongoing.

Potential cumulative impacts may arise during construction and operation, as a consequence of the development of the Proposed Development acting in-combination with other plans and projects, on water quality in the downstream surface water environment, and on disturbance and habitat loss to birds.

There is potential for cumulative impacts to arise with other local developments that would also result in increased noise, vibration, and human presence. However, as any disturbance effects from other such local developments are likely to be or a minor nature, temporary, localised and over a short-duration, they are not likely to cumulatively affect the local breeding bird populations in conjunction with the development of the Proposed Development.

Considering the predicted impacts associated with the development of the Proposed Development, the mitigation measures proposed to protect the local biodiversity resource and the receiving environment, and the protective policies and objectives on the land-use plans that will direct future development locally, significant cumulative negative effects on biodiversity are not predicted.

19.3.3 Land, Soils and Geology (Chapter 7)

19.3.3.1 Dublin Central Masterplan

No cumulative impacts are noted for land, soils and geology.

19.3.3.2 Proposed Development – Site 3, 4 & 5

No cumulative impacts are noted for land, soils and geology.

19.3.4 Water (Chapter 8)

19.3.4.1 Dublin Central Masterplan

No cumulative impacts are noted for water.

19.3.4.2 Proposed Development – Site 3, 4 & 5

No cumulative impacts are noted for water.

19.3.5 Climate (Air Quality and Climate Change) (Chapter 9)

19.3.5.1 Proposed Development – Site 3, 4 & 5

Construction Stage

The proposed Dublin Central Masterplan development will be constructed in a number of sites (Site 1 – 5), the construction stage for the individual phases will overlap with each other thus leading to cumulative construction dust emissions. However, a high level of dust control will be implemented across the full Dublin Central Masterplan site which will control dust emissions from each phase of the development. Therefore, cumulative dust emissions associated with the full Dublin Central Masterplan development will be short-term, localised, negative and imperceptible.

According to the IAQM guidance (2014) should the construction phase of the Proposed Development or Dublin Central Masterplan development coincide with the construction phase of any other development within 350m then there is the potential for cumulative construction dust impacts. However, as stated above a high level of dust control will be implemented across the full Dublin Central Masterplan site which will avoid significant dust emissions. Provided these mitigation measures are in place for the duration of the demolition and construction phase cumulative dust related impacts to nearby sensitive receptors are not predicted to be significant. Cumulative impacts to air quality will be short-term, localised, negative and imperceptible.

Due to the short-term duration of the construction phase and the low potential for significant CO_2 and N_2O emissions cumulative impacts to climate are considered neutral.

There are no significant cumulative impacts to air quality or climate predicted for the construction phase.

Operational Stage

The traffic data reviewed for the operational stage impacts to air quality and climate included the cumulative traffic associated with other existing and permitted developments in the local area as well as traffic associated with the full Dublin Central Masterplan development. Therefore, the cumulative impact is included within the operational stage impact for the Proposed Development. The impact is predicted to be long-term, neutral and imperceptible with regards to air quality and climate.

In addition, the proposed Dublin Central Masterplan development will facilitate the development of the proposed Metrolink with a station located within the development. The development of the Metrolink, if permitted, will provide for an alternative, more sustainable method of transport in comparison to personal passenger cars. This will result in a positive impact to air quality and climate by reducing emissions associated with cars.

19.3.6 Climate – (Sunlight & Daylight) (Chapter 10)

19.3.6.1 Masterplan

No cumulative impacts are noted for sunlight and daylight.

19.3.6.2 Proposed Development – Site 3, 4 & 5

No cumulative impacts are noted for sunlight and daylight.

19.3.7 Air, Noise and Vibration (Chapter 11)

19.3.7.1 Dublin Central masterplan

Construction Phase

The construction stages of the Dublin Central Masterplan will occur on a phased basis. There are no expected cumulative impacts associated with external construction works to the Dublin Central Masterplan. The closest construction work relative to the site is more than 40m from the closest site boundary. As illustrated in Table 11.22**Error! Reference source not found.**, the contribution from any secondary site external to the Dublin Central Masterplan is likely to be more than 10 dB below noise contribution from the closest site within the Dublin Central Masterplan and will not add to the noise impact at the nearest sensitive receptor.

Notwithstanding the above, any cumulative construction activities undertaken will be required to operate below the recommended noise and vibration criteria set out in Section 11.5.1.1.1 Section 11.5.1.1.3. Mitigation measures and recommended good practices have been outlined in Section 11.6.1.1.

Operational Phase

The different sites within the Dublin Central Masterplan will be designed so that the cumulative noise emissions from processes and activities are within the relevant noise criteria set out. In the same way, Proposed Developments external to the Dublin Central Masterplan site will in turn be designed in order to comply with appropriate noise criteria.

Any major Proposed Development in close proximity to the Dublin Central Masterplan site will be required to prepare an EIAR wherein cumulative impacts will also be considered.

19.3.7.2 Proposed Development – Site 3, 4 & 5

Construction Phase

The similar magnitude of residual noise and vibration impacts discussed in Section 11.7.1 for the Dublin Central Masterplan are relevant to the cumulative assessment of construction works external to the proposed site given it is anticipated that the same construction noise and vibration criteria would apply to these external construction sites.

Operational Phase

The different sites within the Proposed Development will be designed so that the cumulative noise emissions from processes and activities are within the relevant noise criteria set out. In the same way, Proposed Developments external to the Proposed Development will in turn be designed in order to comply with appropriate noise criteria.

Any major proposed development in close proximity to the Proposed Development will be required to prepare an EIAR wherein cumulative impacts will also be considered.

19.3.8 Landscape and Visual Impact (Chapter 12)

19.3.8.1 Masterplan

No cumulative impacts are noted for landscape and visual impact.

19.3.8.2 Proposed Development – Site 3, 4 & 5

No cumulative impacts are noted for landscape and visual impact.

19.3.9 Material Assets (Transportation) (Chapter 13)

19.3.9.1 Masterplan

Construction Phase

The Potential Impact of the Cumulative Development arising from the Construction Stage is the same as the Potential Impact of the Proposed Development described in Section 13.5.1.1.

Operational Phase

The Potential Impact of the Cumulative Development arising from the Operational Stage is the same as the Potential Impact of the Proposed Development described in Section 13.5.1.2.

Do Nothing Impact

In the event that the Dublin Central development and the Metrolink Station do not proceed, the transportation environment in the surrounding area will remain as existing.

In this scenario, there will be no Metrolink Station in O'Connell Street Upper nor will there be a public plaza between O'Connell Street Upper and Moore Street.

The existing lanes at O'Rahilly Parade, Moore Lane and Henry Place will remain in their current dilapidated state with inadequate carriageways and no footpaths.

Finally, public transport services including Dublin Bus and the Luas Green Line should continue to operate as at present.

Overall, the do-nothing impact will be to retain the existing poor environment for cyclists and pedestrians between O'Connell Street Upper and Moore Street.

19.3.9.2 Proposed Development – Site 3, 4 & 5

Construction Phase

The Potential Impact of the Cumulative Development arising from the Construction Stage of the Proposed Development (Sites 3, 4 and 5) will be the same as the Potential Impact of the Proposed Development (Dublin Central Masterplan Site) described in Section 13.5.1.3.1.

Operational Phase

The Potential Impact of the Cumulative Development arising from the Operational Stage of the Proposed Development will be the same as the Potential Impact of the Dublin Central Masterplan described in Section 13.5.1.3.2.

Do Nothing Impact

The Do-Nothing Impact of the Cumulative Development arising from the non-development of the Proposed Development (Sites 3, 4 and 5) will be the same as the Do-Nothing Impact of the Dublin Central Masterplan described in Section 13.5.1.3.3.

19.3.10 Material Assets (Waste) (Chapter 14)

19.3.10.1 Proposed Development – Site 3, 4 & 5

Construction Phase

Multiple permissions remain in place for both residential and commercial developments within the vicinity of the development. Due to the high number of waste contractors in the Dublin region there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise / mitigate any potential cumulative effects associated with waste generation and waste management. As such the effect will be short-term, not significant and negative.

Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise / mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a long-term, imperceptible and neutral.

Do Nothing Impact

If the Proposed Development was not to go ahead there would be no demolition, construction or operational waste generated at this site. There will would be a neutral effect on the environment.

19.3.11 Cultural Heritage (Architectural) (Chapter 15)

19.3.11.1 Masterplan

Construction Stage

The masterplan site contains complete or almost complete streetscapes, each element of which both encloses the masterplan site and fulfils an important role in characterising the immediate and wider receiving urban landscape. At construction stage, each terraced streetscape will be temporarily screened with scaffolds and hoarding to facilitate the development and protect both users and built fabric in the vicinity of the masterplan site.

Methodologies for consolidation and repair of shared boundaries will be executed in order to maintain their integrity and mitigate risks arising from the works, as cited in the various construction and management Chapters 3.1 – 3.4 of this EIAR.

The observation of mitigations to protect the wider character of the receiving environment at construction stage, will reduce cumulative impacts potentially arising from the development.

Operational Stage

On completion, the cumulative impact of the combined masterplan area redevelopment on its enclosing urban environs will be considerable. The masterplan site has, since its origins, not known a period of decline as it has experienced since the early 1980s, particularly in the context of the rest of

the city, which has, in the round, improved markedly over the intervening period. That same environment has withstood the perceived hostility of urban decay as now defining its urban character.

Notwithstanding the inevitable change in character, other large-scale schemes have been constructed in the vicinity of the masterplan area, all contributing collectively to the increasingly 20th century character of the townscape which has proven that it can tolerate and indeed embrace structures of scale and contrasting design.

It follows that the site's redevelopment, whilst maintaining the urban character will seek to exploit its scale, street frontage and historical pattern of diverse and successive redevelopment, in the generation of a more ambitious scheme than presently exists.

The masterplan site's changing chronology over time introduced, at each successive stage of development, buildings of scale, density and architectural treatment, radically contrasting with the smaller scale residential character of 18th and 19th century buildings in the vicinity. At each stage, the enclosing urban environs have evolved to embrace these changes in morphological character.

The cumulative impact of building on a tradition of ambitious development on this site is thus held to be lessened on account of the site's existing and past morphological character, and how that same character was accommodated by its enclosing environs on account of the proportions of the enclosing streets and internal laneways, and a passive interaction with same.

Do Nothing Impact

If the proposed masterplan development were not to proceed, no demolition, construction or more importantly urban conservation would occur. Whilst presenting a neutral impact, a 'do nothing impact' could also be interpreted as presenting a 'worst case' impact for building fabric of significance in the masterplan area, together with its interaction with its receiving environment. Prolonging or potentially abandoning its development would essentially continue the prevalent cycle of dereliction and urban decay with long-term adverse consequences for presently retainable and conservable structures and that of their receiving historic environment.

19.3.11.2 Proposed Development – Site 3, 4 & 5

Construction Stage

Cumulative temporary and permanent construction stage impacts for the combined development of Sites 3,4 and 5 will be reduced in the observance of mitigating strategies summarised in Chapter 15.7 of this EIAR, as cited in the various construction and management Chapters 3.1 -3.4 of this EIAR.

Operational Stage

The existing contribution of the combined Sites 3,4 and 5 to their receiving environment is adversely impacted by dominance of under-functioning or vacant buildings with far- reaching consequences for the character of their enclosing urban environment. Cumulative impacts following the completion of the development are considered to be positive, both for the purposeful occupancy and conservation of retained structures, and the positive engagement of the scheme with its context.

Do-Nothing Impact

A 'do nothing' impact for Sites 3, 4 and 5 equates to a 'worst case impact'. Whilst the combined sites' interaction with the ACA would remain static, delaying or not proceeding with their redevelopment, would, in time create a challenge for the presentation of the heritage significance of Moore Street and its National Monument that might not be possible to overcome in isolation of the development of these sites.

19.3.12 Cultural Heritage (Archaeology) (Chapter 16)

19.3.12.1 Dublin Central Masterplan

Construction Stage

Potential cumulative impacts may arise during construction and operation, as a consequence of the Proposed Development acting in-combination with other plans and projects. The archaeological sites within the environs of the development are subsurface in nature and do not have an above ground legibility, the below ground surviving remains albeit truncated provide a record of the of the past.

Considering the predicted impacts associated with the implementation of the Dublin Central Masterplan on archaeology, the mitigation measures proposed to identify and record the archaeological resource and the receiving environment, and the protective policies and objectives of the City Development Plans that will direct future development locally, significant cumulative negative effects on archaeology are not predicted.

Operational Stage

There is no likely or significant predicted impact during the operational stage of the Dublin Central Masterplan area. All physical archaeological impact issues will be resolved at the pre-construction stage of the development and therefore no potential impacts are envisioned at the operation stage of the development.

The Dublin Central Development proposals include the retention of structures of historic merit that are contemporaneous with the events of the 1916 Easter Rising, the retention of the laneways of the evacuation route from the GPO and the reuse of stone sett pavements and kerbstones. When considered in combination with the development of Nos. 14 – 17 Moore Street as a commemorative centre the Proposed Development will have a permanent positive impact on the setting of the national monument. It ensures its protection and appreciation into the future and will bring to the fore the relationship between these structures and laneways and the history and heritage of the Moore Street area.

The retention of the lanes and properties of historic merit within the site have a significant positive and permanent impact on the setting of the National Monument.

Do Nothing Impact

In the "do-nothing" scenario the Dublin Central Masterplan area would not be redeveloped and therefore there would be no adverse impacts to any as yet undiscovered subsurface archaeological deposits, features or finds. Under the do-nothing scenario, any archaeological features that lie below the existing ground level will remain in- situ. Any information that might enhance our understanding of the eastern development of the city in the early post medieval and post medieval period will remain unknown.

19.3.13 Risk Management (Major Accidents and Disasters) (Chapter 17)

As outlined in sections 17.5.1.6 and 17.5.1.7, no likely risks of a major accident / disaster occurring are identified during construction stage. A medium risk of major accident / disaster is identified during the operational phase. No cumulative effects are identified.

20 SUMMARY OF RESIDUAL IMPACTS

20.1 Introduction

This Chapter of the EIAR collates the predicted residual impacts on the environment as identified in Chapters 5 to 17, arising from the Dublin Central Masterplan and Proposed Development, during Construction and Operational Phases.

Residual Impacts, according to the Draft EPA Guidelines (2017, p.3) are: -

> *"The final or intended effects which occur after the proposed mitigation measures have been implemented."*

A summary of the Proposed Mitigation Measures are outlined under Chapter 18: Summary of Mitigation Measures.

This chapter has been prepared by Stephen Little, Managing Director and Michael O'Sullivan, Senior Planner, of Stephen Little & Associates. Stephen has 29 years' professional experience of town planning in Ireland, is a Corporate Member of both the Irish Planning Institute and the Royal Town Planning Institute and holds a Diploma in EIA Management (UCD). Michael has 7 years' professional experience in the planning in both the public sector and private consultancy in Ireland, has a MPlan – Master in Planning & Sustainable Development and is a Corporate Member of the Irish Planning Institute.

20.2 Proposed Residual Impacts

20.2.1 Population and Human Health (Chapter 5)

20.2.1.1 Dublin Central Masterplan

Construction Stage

Residual Impacts on Business and Residences

Taking into account the mitigation measures outlined in Section 5.6.6.1 in Chapter 5 of this EAIR it is predicted that there will be no likely significant effect with regard to the construction phase on business and residences.

Residual Impacts on Human Health from Air Quality

The greatest residual impact on air quality during the demolition and construction phase of the Dublin Central Masterplan is from construction dust emissions and the potential for nuisance dust. Taking into account the mitigation measures in Section 9.4.3 (and Appendix 9.2 'Dust Minimisation Plan' of Chapter 9: Climate (Air Quality & Climate Change) this EIAR, there will be no residual impact to human health arising from air quality impact.

Residual Impacts on Human Health from Noise & Vibration

Taking into account the mitigation measures and design recommendations outlined in Section 11.6.1 of Chapter 11: Air (Noise & Vibration) of this EIAR, there will be no residual impact to human health arising from noise and vibration impact.

Residual Impacts on Local Amenities and Tourism

It is predicted that there will be no likely significant effect of the residual impacts of the construction of the Proposed Masterplan Development on material assets.

Residual Impacts from Additional Traffic

Taking into account mitigation measures there will be no residual impact to human health arising from additional traffic.

Unplanned Events/Impacts on Health and Safety

Taking into account the mitigation measures outlined in Section 5.2.6 it is predicted that there will be no likely significant effect arising from the predicted residual impacts with regard to the construction phase for unplanned events and human health and safety.

Operational Stage

Residual Impacts on Businesses and Residences

Taking into account the mitigation measures outlined in Section 5.2.6 the predicted residual impacts with regard to the operational phase on business and residences is concluded to be positive and significant.

Residual Impacts on Human Health from Air Quality

It is predicted that there will be no likely significant effect of the residual impact of air quality on Human Health.

Residual Impacts on Human Health from Noise & Vibration

Taking into account the mitigation measures and design recommendations outlined in section 11.6.2 of Chapter 11: Air (Noise & Vibration) of this EIAR, there will be no residual impact to human health arising from noise and vibration impact.

Residual Impacts on Local Amenities and Tourism

It is predicted that there will be no likely significant effect of the residual impact of the operational phase of the Proposed Dublin Central Masterplan Development on local amenities and tourism.

Residual Impacts on Material Assets

It is predicted that there will be no likely significant effect of the residual impact of the operational phase of the Proposed Dublin Central Masterplan Development on material assets.

Residual Impacts from Additional Traffic

Taking into account the mitigation measures and design recommendations outlined in section 13.6.2 of Chapter 13: Material Assets (Transportation) of this EIAR, there will be no residual impact to human health arising from noise and vibration impact.

Unplanned Events/Impacts on Health and Safety

It is predicted that there will be no likely significant effect of the residual impact of the operational phase of the Proposed Dublin Central Masterplan Development on unplanned events and human health and safety.

Worst Case Effect

The precautionary principle has been applied throughout this assessment.

20.2.1.2 Proposed Development – Site 3, 4 & 5

Construction Stage

The residual impacts of the Proposed Development (Sites 3, 4 and 5) are the same as the remedial impacts of the Proposed Masterplan Development described in Section 5.7.1.1.

Operational Stage

The residual impacts of the Proposed Development (Sites 3, 4 and 5) are the same as the remedial impacts of the Proposed Masterplan Development described in Section 5.7.1.2.

Worst Case Impact

The precautionary principle has been applied throughout this assessment.

20.2.1.3 Cumulative

Construction Stage

The cumulative impact of other potential impacts on human health from air quality, noise quality and traffic have been incorporated into the various models and assessments that have contributed to section 5.5 in chapter 5 of this EIAR.

Operational Stage

The cumulative impact of other potential impacts on human health from air quality, noise quality and traffic have been incorporated into the various models and assessment that have contributed to section 5.5 in chapter 5 of this EIAR.

20.2.2 Biodiversity (Chapter 6)

20.2.2.1 Dublin Central Masterplan

Designated Sites

<u>European Sites</u>

The assessment presented in the Appropriate Assessment Screening Report concluded that there was no risk of the Proposed Development resulting in a likely significant effect on any European site, either alone or in combination with other plans or projects. Therefore, the Proposed Development is not likely to have significant residual effects on any European sites.

<u>National sites</u>

There is no risk of the Proposed Development to affect the integrity of any nationally designated site, either alone or in combination with other plans or projects. Therefore, the Proposed Development is not likely to have significant residual effects on any nationally designated sites.

Birds

The effects of the proposed development on breeding birds have been considered within Section 6.6.2.5 of chapter 6. Measures to avoid, reduce and mitigate effects on breeding birds have been provided in Section 6.6.3.2. Following the implementation of these measures, residual effects on breeding birds arising from the proposed development will be reduced to levels not considered to be significant.

Worst Case Impact

Construction and operational activities are assessed under the best and worst-case operating conditions, to determine all potential impacts associated with the Dublin Central Masterplan

20.2.2.2 Proposed Development – Site 3, 4 & 5

Designated Sites

European Sites

The assessment presented in the Appropriate Assessment Screening Report concluded that there was no risk of the Proposed Development resulting in a likely significant effect on any European site, either alone or in combination with other plans or projects. Therefore, the Proposed Development is not likely to have significant residual effects on any European sites.

National Sites

There is no risk of the Proposed Development to affect the integrity of any nationally designated site, either alone or in combination with other plans or projects. Therefore, the Proposed Development is not likely to have significant residual effects on any nationally designated sites.

Birds

The effects of the proposed development on breeding birds have been considered within Section 6.7.2.3. Measures to avoid, reduce and mitigate effects on breeding birds have been provided in Section 6.7.3.2. Following the implementation of these measures, residual effects on breeding birds arising from the proposed development will be reduced to levels not considered to be significant.

Worst Case Impact

Construction and operational activities are assessed under the best and worst-case operating conditions, to determine all potential impacts associated with the Proposed Development.

20.2.3 Land, Soils and Geology (Chapter 7)

20.2.3.1 Dublin Central Masterplan

Construction Stage

With the protective measures noted above in place during excavation works, any potential impacts on soils and geology in the area will be minimised.

The Proposed Development will result in a surplus of excavated material, which may contain contaminants. Any contaminated material will be exported to an approved licensed waste facility.

No significant adverse impacts on the soils and geology of the subject lands are envisaged.

Operational Stage

During the operational stage, the buildings and public realm will be an urban environment, largely covered in roof and hard standing. Some areas with permeable paving, tree pits and green planting will allow for some surface water to permeate the soil. These SuDS devices treat and improve water quality by trapping suspended solids and filtering pollutants before they enter the soil.

No likely significant adverse impacts are predicted on soils or geology.

Worst Case Impact

The worst case scenario would be for contaminated soils to be encountered during the works. As noted above, any contaminated soils encountered will be excavated and disposed of off-site in accordance with the Waste Management Acts, 1998 – 2006, and associated regulations and guidance provided in Guidelines for the Management of Waste from National Road Construction Projects published by the National Roads Authority in 2008.

In the worst case scenario, subsoil may be exposed to inclement weather during construction and may result in the erosion of soils. However, with the proposed mitigation measures the quantity of soils exposed and the duration of that exposure will be minimised.

20.2.3.2 Proposed Development – Site 3, 4 & 5

Construction Stage

The residual impacts for the Proposed Development (Sites 3, 4 and 5) are the same as the residual impacts described for the Dublin Central Masterplan described in Section 7.7.1.1.

Operational Stage

The residual impacts for the Proposed Development (Sites 3, 4 and 5) are the same as the residual impacts described for the Dublin Central Masterplan described in Section 7.7.1.2.

Worst Case Impact

The worst case impact for the Proposed Development (Sites 3, 4 and 5) are the same as the worst case impact described for the Dublin Central Masterplan described in Section 7.7.1.3.

20.2.4 Water (Chapter 8)

20.2.4.1 Dublin Central Masterplan

Water Supply

Construction Stage

Due to the proposed remedial measures outlined above no significant adverse impacts are expected to arise during the construction stage of the implementation of the Dublin Central Masterplan on the water supply network.

Operational Stage

There will be a water demand for the implementation of the Dublin Central Masterplan of approximately 800m^3 per day. Irish Water will confirm whether the existing network has sufficient capacity, or alternatively will outline any upgrades required to facilitate the development.

Foul Water Drainage

Construction Stage

During the construction stage of implementation of the Dublin Central Masterplan some short term negative impacts as identified above may result. However, if the proposed remedial and reductive measures are implemented, the impact of the implementation of the Dublin Central Masterplan during the construction stage will be minimised and **no significant long term impacts** will result from the construction works.

Operational Stage

By removing surface water flows from the combined network, the implementation of the Dublin Central Masterplan will result in a net decrease in the wastewater flows discharging to the existing combined drainage system.

Surface Water Drainage

Construction Stage

During the construction stage of implementation of the Dublin Central Masterplan some short term negative impacts as identified above may result. However, if the proposed remedial and reductive measures are implemented, the impact of the implementation of the Dublin Central Masterplan during the construction stage will be minimised and **no significant long term impacts** will result from the construction works.

Operational Stage

With the implementation of the SuDS treatment train, attenuation and flow control, there will be a net improvement in the quality and a net reduction in the quantity of surface water discharging from the individual site within the Dublin Central Masterplan. The proposal to discharge Site 5 to the existing surface water network, rather than the combined network, will result in a significant decrease in flows to the combined network and a net increase in flows to the surface water network.

No significant adverse impacts are envisaged.

Worst Case Impact

In the worst case scenario, there could be some surface water ingress into the foul water drainage system due to poor workmanship. Leakage from sewers and drains could result in local contamination of soil and ground waters in the area. The runoff from the roads and hardstanding areas will discharge contaminants, including oils and silts, to the surface water system which might result in polluting of the surface water network. However, with the mitigation measures set out above, the likelihood of these impacts will be minimised, and **no significant long term impacts** will result from the development.

20.2.4.2 Proposed Development – Site 3, 4 & 5

Water Supply

The potential impacts on water supply of the Proposed Development (Sites 3, 4 and 5) are the same as the potential impacts of the Dublin Central Masterplan described in Section 8.7.1.1.

Foul Water Drainage

The potential impacts on foul water drainage of the Proposed Development (Sites 3, 4 and 5) are the same as the potential impacts of the Dublin Central Masterplan described in Section 8.7.1.2.

Surface Water Drainage

The potential impacts on surface water drainage of the Proposed Development (Sites 3, 4 and 5) are the same as the potential impacts of the Dublin Central Masterplan described in Section 8.7.1.3.

Worst Case Impact

The worst case impact of the Proposed Development (Sites 3, 4 and 5) is the same as the do noting impact of the Dublin Central Masterplan described in Section 8.5.1.4.

20.2.5 Climate (Air Quality and Climate Change) (Chapter 9)

20.2.5.1 Dublin Central Masterplan

Construction Stage

Air Quality

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of a dust minimisation plan which will be incorporated into the construction environmental management plan (CEMP) for the site. Provided the dust minimisation measures outlined in the plan (see Appendix 9.2 and Section 9.6.1.1) are adhered to, the air quality impacts during the construction phase will be short-term, negative, localised and imperceptible.

Construction traffic emissions will have a **long-term, localised, negative** and **imperceptible** impact on air quality.

Climate

According to the IAQM guidance (2014) site traffic and plant are unlikely to make a significant impact on climate during the construction phase. Therefore, the potential impact on climate is considered to be **imperceptible** 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 (see Table 9.1). Therefore, the impact of construction of the proposed development is likely to be **negative, short-term** and **imperceptible** with respect to human health.

Operational Stage

Air Quality

As the traffic generated by the proposed development does not meet the criteria detailed in Section 9.2.2.1, for requiring a detailed air quality assessment the impact to air quality from traffic emissions during the operational stage is **neutral, long-term** and **imperceptible**.

Climate

The traffic associated with the operational phase of the proposed development is below the criteria requiring a detailed climate assessment. The impact to climate as a result of traffic emissions is predicted to be **long-term, neutral** and **imperceptible**.

In addition, the proposed development has been designed to reduce the impact to climate where possible through incorporated design measures. Full details of all measures included are outlined within the Energy & Sustainability Statement submitted as part of this planning application.

Human Health

Emissions of air pollutants are predicted to be significantly below the ambient air quality standards which are based on the protection of human health, impacts to human health are **long-term, neutral** and **imperceptible**.

Worst Case Impact

In terms of construction phase impacts, worst-case assumptions regarding volumes of excavation materials and number of vehicle movements have been used in order to determine the highest level of mitigation required in relation to potential dust impacts (see Section 9.5.1.1). The Masterplan development is the worst-case scenario in terms of dust emissions, emissions from each individual phase will be lower than the cumulative masterplan development.

Worst-case traffic data was used in the assessment of construction and operational phase impacts. In addition, conservative background concentrations were used in order to ensure a robust assessment. Thus, the predicted results of the construction and operational stage assessment are worst-case and the significance of effects is most likely overestimated.

20.2.5.2 Proposed Development – Site 3, 4 & 5

Construction Stage

Air Quality

Once the dust minimisation measures outlined in Section 9.6.1.1 and Appendix 9.2 are adhered to, the air quality impacts during the construction phase will be **short-term, negative, localised** and **imperceptible**.

Climate

According to the IAQM guidance (2014) site traffic and plant are unlikely to make a significant impact on climate during the construction phase. Therefore, the potential impact on climate is considered to be **imperceptible** 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 (see Table 9.1). Therefore, the impact of construction of the proposed development is likely to be **negative, short-term** and **imperceptible** with respect to human health.

Operational Stage

Air Quality

As the traffic generated by the proposed development does not meet the criteria detailed in Section 9.2.2.1 for requiring a detailed air quality assessment the impact to air quality from traffic emissions during the operational stage is **neutral, long-term** and **imperceptible**.

Climate

The traffic associated with the operational phase of the proposed development is below the criteria requiring a detailed climate assessment. The impact to climate as a result of traffic emissions is predicted to be **long-term, neutral** and **imperceptible**.

In addition, the proposed development has been designed to reduce the impact to climate where possible through incorporated design measures. Full details of all measures included are outlined within the Energy & Sustainability Statement submitted as part of this planning application.

Human Health

Emissions of air pollutants are predicted to be significantly below the ambient air quality standards which are based on the protection of human health, impacts to human health are **long-term, neutral** and **imperceptible**.

Worst Case Impact

The worst case impact described in Section 9.7.1.3 for the development of the Dublin Central Masterplan is also applicable to the proposed development.

20.2.5.3 Cumulative

Construction Stage

The proposed masterplan development will be constructed in a number of phases sites (Site 1 – 5), the construction stage for the individual phases will overlap with each other thus leading to cumulative construction dust emissions. However, a high level of dust control will be implemented across the full masterplan site which will control dust emissions from each phase of the development. Therefore, cumulative dust emissions associated with the full masterplan development will be short-term, localised, negative and imperceptible.

According to the IAQM guidance (2014) should the construction phase of the proposed development or masterplan development coincide with the construction phase of any other development within 350m then there is the potential for cumulative construction dust impacts. However, as stated above a high level of dust control will be implemented across the full masterplan site which will avoid significant dust emissions. Provided these mitigation measures are in place for the duration of the demolition and construction phase cumulative dust related impacts to nearby sensitive receptors are not predicted to be significant. Cumulative impacts to air quality will be short-term, localised, negative and imperceptible.

Due to the short-term duration of the construction phase and the low potential for significant CO_2 and N_2O emissions cumulative impacts to climate are considered neutral.

There are no significant cumulative impacts to air quality or climate predicted for the construction phase.

Operational Stage

The traffic data reviewed for the operational stage impacts to air quality and climate included the cumulative traffic associated with other existing and permitted developments in the local area as well as traffic associated with the full masterplan development. Therefore, the cumulative impact is included within the operational stage impact for the proposed development. The impact is predicted to be long-term, neutral and imperceptible with regards to air quality and climate.

In addition, the proposed masterplan development will facilitate the development of the proposed MetroLink with a station located within the development. The development of the MetroLink, if permitted, will provide for an alternative, more sustainable method of transport in comparison to personal passenger cars. This will result in a positive impact to air quality and climate by reducing emissions associated with cars.

Worst Case Impact

The worst case impact described in Section 9.7.1.3 for the development of the Dublin Central Masterplan is also applicable to the cumulative development.

20.2.6 Climate (Sunlight & Daylight) (Chapter 10)

The scale of the development at Sites 3, 4 & 5 will have a minor impact on the shadow environment but the consequences of this will not be noticeable due to the site orientation and existing urban density of the area.

20.2.7 Air, Noise and Vibration (Chapter 11)

20.2.7.1 Dublin Central Masterplan

Construction Stage

Noise

All cumulative Dublin Central Masterplan construction activities are predicted to exceed the noise threshold value when they occur at the closest proximity to the residential, commercial and clinical receptors closest to the proposed site boundary. However, it should be noted that the assessment can be considered highly worst case and it is unlikely that all items of plant assessed will be in operational simultaneously, or that two adjoining sites of the development will be under construction simultaneously. Additionally, the predictions only indicate a potential significant effect (based on a worst-case scenario) when working at the closest location to the dwellings, with lesser impacts predicted at all other locations across site.

The implementation of the mitigation measures outlined in Section **Error! Reference source not found.**, and detailed in Appendix 11.2, will aim to minimise impact of construction noise experienced at nearby residential, commercial and clinical receivers.

Due to the nature of construction noise and the proximity of noise sensitive receivers, it is predicted the residual construction noise levels will be at or above the relevant noise criteria while works are within 15m of commercial receptors and less than 20m of residential receptors during initial site works. There will be a **negative, moderate to significant** and **short-term** residual noise impact during the initial site works activities at commercial and residential receptors within 10m and 15m respectively.

As the initial construction works move greater than 15m and 20m from commercial and residential receptors respectively, the predicted residual noise levels are at or below the relevant noise criteria but above the existing baseline noise levels, there will be a **negative, slight to moderate** and **short-term** noise impact. As the works move further away than 30m, the predicted noise levels are below the relevant noise criteria and existing baseline noise levels there will be a **neutral, not significant** and **short-term** noise impact.

All commercial receptors are predicted to have residual construction noise levels below the relevant noise criteria during utilities and structural construction works. The closest residential receptors are at 15m distance, which have residual noise levels below the relevant noise criteria during works but above the existing baseline noise level. There will be a **negative, slight to moderate** and **short-term** residual noise impact during the utilities and structural construction works at the commercial and residential receptors within 15m. As the works move further away than 20m from commercial and residential receptors, the predicted residual noise levels are below the relevant noise criteria and existing baseline noise levels there will be a **neutral, not significant** and **short-term** noise impact.

All commercial and residential receptors are predicted to have residual construction noise levels below the relevant noise criteria during general construction work activities and below the existing baseline noise levels. At all commercial and residential receptors there will be a **neutral, not significant** and **short-term** impact during general construction work activities.

The closest clinical receptor is at 20m distance with an existing baseline noise level above 70 dB $L_{Aeq,T}$, therefore there will be a **neutral, not significant** and **short-term** residual noise impact during all works activities at closest boundaries to the clinical receptors.

Vibration

No predicted significant adverse impact arising from vibration during construction provided works are carried out so as to fall under the relevant vibration criteria.

Worst Case Impact

In terms of potential noise and vibration impacts, the assessment has considered a range of worst case scenarios to determine the potential impacts of the proposed development.

During the construction phase, a range of worst case scenarios have been assessed assuming all plant items are operating along the closest noise sensitive boundaries. The assessment has determined impacts associated with these scenarios can be controlled through the best practice measures outlined in 11.6.

Operational Stage

Noise

Mechanical Plant Noise

Once cumulative plant noise emissions from the various sites of the Dublin Central Masterplan are designed to achieve the appropriate noise criteria the cumulative noise impact will be **neutral, imperceptible** and **permanent.**

Entertainment Noise

Once entertainment noise is designed and managed to achieve the criteria set out, i.e. inaudibility, the residual noise impact will be **neutral, imperceptible** and **permanent.**

Delivery and Servicing Traffic

Delivery activity has been considered in the context of the existing environment of a serviced, city centre location. The cumulative noise impact will be **neutral, not significant** and **permanent.**

Inward Noise Impact

With respect to inward noise impacts, the specification of noise mitigation has been recommended so that the internal noise criterion will be met. The residual noise impact will be **neutral, not significant** and **permanent.**

Vibration

There are no significant sources of vibration associated with the operational phases of the Dublin Central Masterplan. There is therefore a **neutral, imperceptible** and **permanent** cumulative impact associated.

20.2.7.2 Proposed Development – Site 3, 4 & 5

Construction Stage

Noise

The implementation of the mitigation measures outlined in Section **Error! Reference source not found.**, and detailed in Appendix 11.2, will aim to minimise impact of construction noise experienced at nearby residential, commercial and clinical receivers.

Due to the nature of construction noise and the proximity of noise sensitive receivers, it is predicted the residual construction noise levels will be at or above the relevant noise criteria while works are within 10m of commercial receptors and 15m of residential receptors during initial site works. There will be a **negative, moderate to significant** and **short-term** residual noise impact during the initial site works activities at commercial and residential receptors within 10m and 15m respectively. When the initial construction works are between 10m to 15m of the commercial receptors the residual noise levels are below the relevant noise criteria but above the existing baseline noise levels, there will be a **negative, slight to moderate** and **short-term** noise impact. As the works move more than 20m from commercial and residential receptors the predicted residual noise levels are below the relevant noise criteria and below the existing baseline noise levels, there will be a **neutral, not significant** and **short-term** noise impact.

All commercial and residential receptors are predicted to have residual construction noise levels below the relevant noise criteria during utilities and structural construction works. At commercial receptors within 10m of the works, the residual construction noise level is predicted above the existing baseline noise level. There will be a **negative, slight to moderate** and **short-term** residual noise impact during works at the commercial receptors within 10m. As the works move further away than 10m from commercial receptors and 15m from the closest residential receptors, the predicted residual noise levels are below the relevant noise criteria and existing baseline noise levels, therefore there will be a **neutral, not significant** and **short-term** noise impact.

All commercial and residential receptors are predicted to have residual construction noise levels below the relevant noise criteria during general construction work activities and below the existing baseline noise levels. At all commercial and residential receptors there will be a **neutral, not significant** and **short-term** impact during general construction work activities.

The closest clinical receptor is at 20m distance with an existing baseline noise level above 70 dB $L_{Aeq,T}$, therefore there will be a **neutral, not significant** and **short-term** residual noise impact during all works activities at closest boundaries to the clinical receptors.

Vibration

No predicted significant adverse impact arising from vibration during construction provided works are carried out so as to fall under the relevant vibration criteria.

Operational Stage

Noise

Mechanical Plant Noise

Once cumulative plant noise emissions from the various sites of the Dublin Central Masterplan are designed to achieve the appropriate noise criteria the cumulative noise impact will be **neutral, imperceptible** and **permanent.**

Entertainment Noise

Once entertainment noise is designed and managed to achieve the criteria set out, i.e. inaudibility, the residual noise impact will be **neutral, imperceptible** and **permanent.**

Delivery and Servicing Traffic

Delivery activity has been considered in the context of the existing environment of a serviced, city centre location. The cumulative noise impact will be **neutral, not significant** and **permanent.**

Inward Noise Impact

With respect to inward noise impacts, the specification of noise mitigation has been recommended so that the internal noise criterion will be met. The residual noise impact will be **neutral, not significant** and **permanent.**

Vibration

There are no significant sources of vibration associated with the operational phases of the Dublin Central Masterplan. There is therefore a **neutral, imperceptible** and **permanent** cumulative impact associated.

20.2.7.3 Cumulative

Construction Stage

The similar magnitude of residual noise and vibration impacts discussed in Section 11.7.1 for the Dublin Central Masterplan are relevant to the cumulative assessment of construction works external to the proposed site given it is anticipated that the same construction noise and vibration criteria would apply to these external construction sites.

Operational Stage

The different sites within the proposed development will be designed so that the cumulative noise emissions from processes and activities are within the relevant noise criteria set out. In the same way, proposed developments external to the proposed development will in turn be designed in order to comply with appropriate noise criteria.

Any major proposed development in close proximity to the proposed development will be required to prepare an EIAR wherein cumulative impacts will also be considered.

20.2.8 Landscape and Visual Impact Assessment (Chapter 12)

20.2.8.1 Dublin Central Masterplan

Not applicable as the Masterplan is still being refined and discussions with the Planning Authority are on-going. Notwithstanding this, as the Masterplan presents an integrated design for a new city quarter, no remedial or reductive measures are likely to be applicable.

20.2.8.2 Proposed Development – Site 3, 4 & 5

Since remedial and reductive measures do not apply, residual impacts will, initially, be as tabulated for potential impacts, above. Reduction in the visibility of the Proposed Development, resulting from the construction of other development, will gradually reduce its visibility and thereby its impacts, whether positive, negative or neutral in character.

Worst Case Impact

The effects considered above represent the 'worst case' scenario.

20.2.9 Material Assets (Transportation) (Chapter 13)

20.2.9.1 Dublin Central Masterplan

Construction Stage

Car Parking

During the Construction Stage, there will be a permanent loss of 160 car parking spaces on the subject site currently accessed from O'Rahilly Parade and Moore Lane. The reduction in car parking is predicted to be a **permanent long-term slight** impact which will be ameliorated by the high provision of public transport in the surrounding area.

Traffic Flow/Speed

The presence of construction traffic on the surrounding streets during the Construction Stage is not expected to lead to significant delays to vehicular traffic including public transport. Construction traffic is predicted to generate a temporary **slight negative, short term** impact during the construction site.

Diversion of Traffic

No traffic diversions are proposed on Parnell Street or O'Connell Street Upper. Local traffic diversions could occur on O'Rahilly Parade, Moore Lane and Henry Place which could lead to a temporary **slight negative, short term** impact during the Construction Stage.

Delays to Public Transport

No delays or disruption to bus or Luas services are predicted. Some delays may occur to bus or Luas services on Parnell Street and O'Connell Street Upper northbound due to construction traffic for Dublin Central using Parnell Street to access the development site. This impact is expected to be **temporary, short-term, slight,** and **negative.**