

CHAPTER TWENTY TWO INTERACTIONS BETWEEN ENVIRONMENTAL FACTORS

22.1 INTRODUCTION

All environmental factors are inter-related and this chapter cross references the individual environmental assessment reports undertaken, including the proposed mitigation measures, having regard to current knowledge and methods of assessment. An indication is also given of the cumulative effects of the proposed development when considered with other plans and projects in the relevant study areas, including the other phases of the Masterplan insofar as is possible at this stage.

In practice many impacts have slight or subtle interactions with other disciplines. This chapter highlights those interactions which are considered to potentially be of a significant nature. Discussions of the nature and effect of the impact is primarily undertaken within each of the relevant chapters, while this chapter identifies the most important potential interactions.

22.2 METHODOLOGY

The preparation and coordination of this EIAR ensured that each of the specialist consultants liaised with each other on an ongoing basis and dealt with the likely interactions between effects predicted as a result of the proposed development. This process ensured that appropriate mitigation measures are incorporated into the design process.

At the scoping stage in the preparation of the EIAR for the proposed development, the potential for significant cumulative direct and indirect impacts and interactions were examined and identified. Where identified such impacts and interaction of impacts were included in the scope and addressed in the baseline and impact assessment studies for each of the relevant environmental issues and aspects of the project. The cumulative and indirect impacts and interaction of impacts are presented in each of the EIAR chapters.

The primary direct interactions meaning those interactions which could have likely significant effects, can be summarised as follows:

- Population & Human Health with Biodiversity, Land Soils & Geology, Water & Hydrogeology, Microclimate – Daylight & Sunlight and Pedestrian Wind Comfort & Distress, Traffic & Transport, Waste Management, Landscape, Noise, Air Quality, Climate and Utilities;
- Biodiversity with Population & Human Health, Land Soils & Geology, Water & Hydrogeology, Landscape, Air Quality, Noise, Microclimate-Daylight & Sunlight, and Utilities – Built Services
- Cultural Heritage – Archaeology with Cultural Heritage – Architecture, Land Soils & Geology and Landscape;
- Cultural Heritage – Architecture with Archaeology, Water & Hydrogeology, Landscape, Vibration and Micro Climate – Pedestrian Wind Comfort & Distress;

- Land Soils & Geology with Population & Human Health, Biodiversity, Air Quality & Climate, Water & Hydrogeology, and Waste Management;
- Water & Hydrogeology with Population & Human Health, Biodiversity, Land Soils & Geology, Air Quality, Utilities and Waste Management;
- Landscape with Biodiversity, Cultural Heritage - Architecture, and Microclimate – Pedestrian Wind Comfort & Distress and Daylight & Sunlight;
- Noise & Vibration with Population & Human Health, Biodiversity, Cultural Heritage – Architecture, Land Soils & Geology, Traffic & Transport, and Waste Management;
- Air Quality with Climate, Population & Human Health, Biodiversity, Land Soils & Geology, Water & Hydrogeology, and Traffic & Transport;
- Climate with Population & Human Health, Land Soils & Geology, , Microclimate Daylight & Sunlight; Air Quality, Utilities, Waste Management and Traffic & Transport;
- Microclimate – Pedestrian Wind Comfort & Distress with Landscape and Cultural Heritage – Architecture;
- Microclimate – Sunlight Daylight & Shadow Analysis –Population & Human Health, Biodiversity, Cultural Heritage – Architecture, Landscape and Climate;
- Traffic & Transport – Population & Human Health, Climate, Air Quality and Noise;
- Waste Management with Population & Human Health, Land Soils & Geology, Water & Hydrogeology, Noise, and Climate;
- Utilities & Built Services with Population & Human Health, Biodiversity, Water & Hydrogeology, and Climate;

The matrix and expert opinion approaches, as outlined in the, Study on the Assessment of Indirect & Cumulative Impacts as well as Impact Interaction (DG Environment 1999). were used in the identification of the potential for significant cumulative direct and indirect impacts and interactions. Section 3.7.2 of the EPA Guidelines 2022 states that the interactions between effects on different environmental factors should be addressed as relevant throughout the EIAR. The EPA Guidelines further note that:

“It is general practice to include a matrix to show where interactions between effects on different factors have been addressed. This is usually done using the actual headings used in the EIAR (which may differ from the factors contained in the Directive (ref section 3.3.6). This is typically accompanied by text describing the interactions”.

Refer to Table 22.1 for the matrix of potential interactions.

Table 22.1 Potential Interaction of Effects Matrix

	Population & Human Health	Biodiversity	Cultural Heritage - Archaeology	Cultural Heritage - Architecture	Land Soils & Geology	Water & Hydrogeology	The Landscape	Noise & Vibration	Air Quality	Climate	Pedestrian Wind Comfort	Sunlight & Daylight	Traffic & Transport	Waste Mgmt	Utilities	Major Accident & Risk Mgmt
Population & Human Health		X	X	X	X	CO	X	C	C	CO	O	O	C	CO	CO	C
Biodiversity	X		X	X	C	CO	O	X	C	O	X	X	X	X	X	C
Cultural Heritage - Archaeology	X	X		X	C	X	CO	X	X	X	X	X	X	X	C	C
Cultural Heritage - Architecture	X	X	X		X	X	CO	C	X	X	X	X	C	X	X	C
Land Soils & Geology	C	CO	C	X		C	X	X	C	X	X	X	X	C	X	C
Water & Hydrogeology	X	C	C	X	C		X	X	X	X	X	X	X	C	CO	C
The Landscape	CO	O	X	CO	X	X		X	X	X	O	X	X	X	O	C
Noise & Vibration	CO	X	X	C	X	X	X		X	X	X	X	C	X	C	C
Air Quality	CO	X	X	X	X	X	X	X		X	X	X	CO	O	X	C

Climate	CO	X	X	X	X	X	X	X	X		X	O	CO	X	X	C
Pedestrian Wind Comfort	O	X	X	X	X	X	O	X	X	X		X	X	X	X	X
Sunlight & Daylight	O	X	X	X	X	X	X	X	X	O	X		X	X	X	X
Traffic & Transport	CO	X	X	C	X	X	X	CO	CO	CO	X	X		C	X	C
Waste Mgmt.	CO	X	X	X	C	C	O	X	X	CO	X	X	C		X	C
Utilities	O	X	X	X	C	CO	O	C	X	X	X	X	X	X		C
Major Accident & Risk Mgmt	C	C	C	C	C	C	C	C	C	C	X	X	C	C	C	

C- Construction Interaction

O – Operation Interaction

CO – Construction & Operation Interaction

X – No Significant Interaction

22.3 DESCRIPTION OF THE INTERACTIONS

Each chapter of the EIAR details baseline information and identifies the significant potential and residual construction and operational effects/impacts of the proposed development. However, this Chapter details the significant interactive and inter-related effects/impacts. Table 22.2 indicates the key elements and activities of the proposed development during both the site preparation and operational phases and how they inter-act and inter-relate with the various environmental aspects considered in detail in Chapter 6.0 through to Chapter 21.0 of this EIAR.

22.3.1 Indicative Interactions

The purpose of Table 22.2 is to demonstrate the main likely and significant inter-relationships and interactions between different environmental aspects considered. While many inter-relationships and interactions have been identified, it is anticipated that the mitigation measures included in the proposed development (and outlined in the other relevant sections of the EIAR) will also minimise or off-set potential for significant effects. With mitigation measures in place, no significant residual negative impacts are predicted

Table 22.2 Summary of Key Proposed Activities and Scheme Elements that Inter-Act and Cause Inter-Related Effects

Chapter	Interaction With	Interaction
Population & Human Health	Landscape	The proposal has the potential to impact on the landscape and visual resources perceived by human beings. However, the proposed materiality, juxtaposition of buildings, an evolving cityscape and landscape proposals including provision of open space, significant public realm and trees, all serve to mitigate the perceptual impact arising from new development in the area such that no significant negative visual impacts occur.
	Biodiversity	Invasive species if not managed correctly on site in accordance with the accompanying Invasive Species Management Plan has the potential to cause minor, adverse impact on human health.
	Land Soils & Geology	There is potential for exposure of onsite workers and visitors via asbestos fibres during demolition works, and potentially contaminated dust / vapors and soil (including asbestos), released by the construction works. However, the employment of good construction management practices, and mitigation and monitoring measures (as set out in Chapter 10, Volume 2 – EIAR) will serve to minimise any adverse or significant risk on human health.
	Utilities	The operational stage increased population will create greater demand on built services, including the telecommunications network and will place greater demand on water requirements and the public sewer. Uisce Eireann has confirmed capacity. This is dealt with in Chapter 20.0. The potential significant impacts on human health arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.
	Material Assets - Traffic & Transport	Traffic flow for construction vehicles in the locality has potential to impact upon road safety by virtue of increased traffic volumes, albeit being temporary in nature. Traffic flow during operation within the site has the potential to create safety risks for pedestrians and cyclists, if the design does not provide for safe pedestrian / cycling environments. Appropriate mitigation is included to reduce the impact on road safety and a Road Safety Audit has been undertaken.
	Material Assets – Waste Management	Management of asbestos waste during construction has the potential to impact human health and which has been carefully mitigated with an Asbestos Removal Plan to be delivered on site. Similarly waste management during operation, if not effectively managed has the potential to impact human health. This will be mitigated through measures detailed in the

		Operational Waste Management Plan accompanying the application for approval.
	Microclimate Pedestrian Wind Comfort	The position and height of buildings have the potential to generate wind tunnelling which can affect the usability and enjoyment of public and private open space. Wind modelling has been undertaken and it has been demonstrated that no significant permanent negative impacts will occur.
	Daylight & Sunlight	The proposed development can impact daylight and sunlight standards and the quality of living space of adjoining residents, which can impact human health. Also, the proposed development as designed can also have daylight & sunlight implications on the health of future residents. Chapter 17.0 considers these interactions and concludes that Negligible impact is expected in relation to daylight and sunlight access experienced by the future inhabitants of the proposed development and to the existing inhabitants of the adjacent neighbouring buildings. No remedial or mitigation measures are proposed. The residual impacts during the operational phase are considered to be in line with the Predicted Impacts when considering daylight and sunlight to existing and proposed properties.
	Air Quality	There is potential for impact on human health arising from dust during demolition and construction. As the overall sensitivity of the area to dust-related human health effects is low, this results in a low risk of dust-related human health effects. In terms of climate
	Climate	There is potential for human health impacts resulting from climate change associated with greenhouse gas emissions at operational stage. However, the residual impact of the proposed development in relation to GHG emissions is considered negative and slight and not significant.
	Water & Hydrogeology	The main risk of flooding to the site is tidal (high tides and tidal surges) from the River Shannon. The site is at low risk of fluvial flooding from the River Shannon in the absence of a high tidal boundary. The Stonetown Terrace, Salesian and Quarry sites could potentially be at risk of flooding from overland flows originating from the adjacent residential development to the north. Without mitigation there is a risk to human health. However, mitigation measures have been incorporated into the design of the development as detailed in Chapter 11.0, Section 11.3.1t to ensure no adverse, significant impacts occur.

	Noise & Vibration	The greatest potential for noise and vibration impact (and interaction with human health) arising from the proposed development will be in the construction phase. However, following the implementation of the proposed mitigation measures in relation to noise, the impact associated with the construction phase of the proposed development is predicted to be moderate, transient and temporary. No significant impacts on the local noise and vibration climate are predicted during the operational phase of the proposed development. The mitigation measures described in the Noise and Vibration chapter (Chapter 13.0) adequately address this interaction.
Biodiversity	Land Soils & Geology	Excavation and soil works (i.e. through site clearance, removal of made ground etc.) during the construction stage has the potential to cause impact on the biodiversity of the site, for example through disturbance of the available habitats and disturbance of invasive species on site if not managed appropriately. A landscaping plan has been developed for the site promoting the retention of trees and significant vegetation insofar as possible. No potential operational interactions were identified.
	Water, Hydrology & Flood Risk	Surface water contamination and associated flow rates has a potential to effect biodiversity in the area of the site and the River Shannon SAC. A series of mitigation measures are proposed in Chapter 7.0 Biodiversity and Chapter 11.0 Water & Hydrogeology. Mitigation measures are proposed to control the runoff of surface water from the site during construction and operation with respect to the reservoir, River Shannon and Westfields.
	The Landscape	Vegetation is an important aspect, providing and maintaining wildlife corridors. An assessment of the potential impact of the Proposed Development on the surrounding landscape character is detailed in Chapter 12.0, including consideration of the proposed Quarry Park developed around the reservoir and its biodiversity islands. Green links are provided within and throughout the zones The landscaping has significant interaction with biodiversity in relation to the potential of the proposed planting maximising biodiversity benefits.
	Air Quality	There is an overall high risk of dust-related ecological impacts as a result of the proposed demolition and construction activities. Table 14.11 provides mitigation measures for managing dust on site such that the predicted residual, dust-related, biodiversity impact of the construction phase of the proposed development is short-term, direct, negative, localised and not significant.

	Utilities	As detailed in Chapter 7.0 Biodiversity.
	Noise & Vibration	Noise from construction and operational phases of the development has potential to impact on the fauna in the vicinity of the proposed redevelopment. However, Chapter 7.0 Biodiversity has predicted that following suitable mitigation, no significant impacts will occur.
Cultural Heritage - Archaeology	Land Soil & Geology	Site clearance and excavation has the potential to impact upon unknown archaeological features on site. With mitigation measures in place, as detailed in Chapter 8.0 no significant permanent residual negative impacts will occur.
	The Landscape	The landscaping plan has a positive impact upon awareness and preservation of cultural heritage within the development and impact on any sub-surface features discovered during test trenching or monitoring during construction.
	Utilities	The provision of water services and built services has the potential to impact upon unknown archaeological features on site. With mitigation measures in place, as detailed in Chapter 8.0 no significant permanent residual negative impacts will occur.
Cultural Heritage - Architecture	The Landscape	There is the potential for negative visual impacts to the setting of the protected structures during the construction phase. The operational phase will result in an altered visual appearance of the subject site, the design of which, has had regard to the setting of the protected structures. The potential significant impacts on landscape and visual arising from these interactions have been considered within the relevant discipline and mitigation measures outlined in Chapter 12.0 The Landscape and Chapter 9.0 Cultural Heritage – Architecture.
	Noise & Vibration	There is potential for construction works and associated vibration, arising from piling and rock breaking has the potential to undermine the integrity of existing protected structures and buildings of cultural significance. Chapter 13.0 assesses the potential impact and confirms the closest protected structure to any planned piling works is at least 20m from the Flaxmill complex. The impact to protected structures is negative, not significant and short-term.
	Traffic & Transport	Construction traffic has the potential to collide with protected structures and existing heritage buildings of significance on the site. To mitigate this risk, it is proposed to manage construction traffic away from the

		Flaxmill Plaza by facilitating a temporary construction access to the Quarry Zone.
Land & Soils	Population & Human Health	There is potential for exposure of onsite workers and visitors via. asbestos fibres during demolition works, and potentially contaminated dust / vapors and soil (including asbestos), released by the construction works. However, the employment of good construction management practices, and mitigation and monitoring measures (as set out in Chapter 10, Volume 2 – EIAR) will serve to minimise any adverse or significant risk on human health.
	Biodiversity	Excavation and soil works (i.e. through site clearance, re-profiling etc.) during the construction stage have the potential to cause impact on the biodiversity of the site, for example through disturbance of the available habitats and invasive species. Clearance works on site are restricted to certain months to protect breeding habitats.
	Cultural Heritage Archaeology	Site clearance and excavation has the potential to impact upon unknown archaeological features on site. With mitigation measures in place, as detailed in Chapter 8.0 no significant permanent residual negative impacts will occur.
	Landscape	Imported soils and materials necessary to undertake landscaping have the potential to impact the landscape. Any necessary imported soils will be of licensed origin with appropriate compliance testing, subject to on-site inspection procedures.
	Air Quality	There is an overall high risk of dust-related ecological impacts as a result of the proposed demolition and construction activities. Table 14.11 provides mitigation measures for managing dust on site such that the predicted residual, dust-related, biodiversity impact of the construction phase of the proposed development is short-term, direct, negative, localised and not significant.
	Water & Hydrogeology	Excavation and soil works (i.e. through site clearance, removal of made ground etc.) during the construction stage have the potential to cause significant impact on the hydrology and hydrogeology of the site by increasing aquifer vulnerability, deposition of silt in the reservoir, leakage of hydrocarbons, altering the surface water characteristics. A series of mitigation measures are proposed in Chapter 10.0 Land & Soils and Chapter 11.0 Water & Hydrogeology. Mitigation measures are proposed to control the runoff of surface water from the site during construction and operation with respect to the reservoir, River Shannon and Westfields.

	Waste Management	Excavation of lands & soils will generate hazardous waste comprising contaminated soils which must be disposed of to a suitably licensed waste facility, with adequate capacity. If not properly managed, stored, or contained, waste materials may lead to pollution. To mitigate these risks, a carefully planned approach to waste management will be implemented in accordance with the site-specific Resource and Waste Management Plan (RWMP)
Water & Hydrogeology	Population & Human Health	Control of surface water during construction has potential to impact human health due to emissions from site to the hydrosphere or potential flooding during ground works and during operation. During the operational stage surface water management has the potential to cause flooding which may impact human health and safety. Mitigation measures are proposed to control the runoff of surface water from the site during construction and operation, whilst flood mitigation measures are proposed, integral to the development proposal, thereby mitigating against any significant impacts occurring..
	Biodiversity	A deterioration in water quality in the Reservoir and River Shannon, which would adversely impact aquatic biodiversity, could occur during the construction phase of the proposed development due to rainwater run-off containing sediments, concrete and hydrocarbon spillages, and during the operational phase due to the discharge of domestic wastewater. During the construction phase, surface water quality will be protected through the implementation of mitigation measures, which include the regular maintenance and inspection of construction plant, the appropriate storage of potentially polluting substances, the supervision of all concrete works and use of appropriate silt control features where required. Therefore, no potential significant impacts upon water quality - are likely to occur during the construction phase. There -is no likelihood of impacts to water quality during the operational phase of the development.
	Land Soils & Geology	Excavation and soil works (i.e. through site clearance, excavation and removal of made ground) during the construction stage has the potential to cause significant impact on the hydrology and hydrogeology of the site by increasing aquifer vulnerability, deposition of silt in streams, leakage of hydrocarbons, altering the surface water characteristics. Mitigation is proposed to control construction works and offset such concerns, as detailed in Chapter 10.0 and 11.0..
	Waste Management	Hazardous waste comprising contaminated soils and material (asbestos) will be generated following

		excavation and construction works. All waste soil and material will be temporarily stored on-site in designated, secure areas pending collection by a licensed waste contractor and disposed of to a suitably registered waste facility.. If not properly managed, stored, or contained, waste materials may lead to pollution. To mitigate these risks, a carefully planned approach to waste management will be implemented in accordance with the site-specific Resource and Waste Management Plan (RWMP)
	Utilities	The construction of the proposed services (water supply, drainage and IT etc.) may affect the local hydrological and hydrogeological environment as there is a risk of suspended solids run off. During the operational phase the potential interactions include discharge of surface water and foul water. Uisce Eireann has issued a Confirmation of Feasibility with respect to wastewater discharge. This is dealt with in Chapter 20.0. Surface water will be managed on site through nature based solutions and mitigation measures prior to discharge to the reservoir on site.
The Landscape	Population & Human Health	The proposal has the potential to impact on the landscape and visual resources perceived by human beings. However, the proposed materiality, juxtaposition of buildings, an evolving cityscape and landscape proposals including provision of open space, significant public realm and trees, all serve to mitigate the perceptual impact arising from new development in the area such that no significant negative visual impacts occur.
	Microclimate – Pedestrian Wind Comfort	The position of trees and landscaping features have the potential to mitigate wind tunnelling which can affect the usability and enjoyment of public and private open space. Wind modelling has been undertaken and it has been demonstrated that no significant permanent negative impacts will occur.
	Utilities	The emergence of plant at roof top level and the micro siting of telecommunications equipment to facilitate the development resulting in short-term, slight to not-significant, neutral visual effects for the existing resident population and users of the surrounding road network.
	Cultural Heritage - Architecture	The removal of some elements of the boundary wall around Cleaves to facilitate permeability will result in the loss of historic features and fabric of significance. The impact of the proposed development on the architectural heritage character of the wider setting during the operational phase has in built design mitigation with careful consideration given to the height and massing of buildings relative to the protected structures on site, design references taken from the

		heritage buildings with reference to the rhythm of windows and the use of materials and finishes, all as detailed in Chapter 9.0 Cultural Heritage – Architecture.
	Biodiversity	Vegetation is an important aspect, providing and maintaining wildlife corridors. An assessment of the potential impact of the Proposed Development on the surrounding landscape character is detailed in Chapter 12.0, including consideration of the proposed Quarry Park developed around the reservoir and its biodiversity islands. Green links are provided within and throughout the zones. The landscaping has significant interaction with biodiversity in relation to the potential of the proposed planting maximising biodiversity benefits.
Noise & Vibration	Population & Human Health	The greatest potential for noise and vibration impact (and interaction with human health) arising from the proposed development will be in the construction phase. However, following the implementation of the proposed mitigation measures in relation to noise, the impact associated with the construction phase of the proposed development is predicted to be moderate, transient and temporary. No significant impacts on the local noise and vibration climate are predicted during the operational phase of the proposed development. The mitigation measures described in the Noise and Vibration chapter (Chapter 13.0) adequately address this interaction.
	Biodiversity	Noise from construction and operational phases of the development has potential to impact on the fauna in the vicinity of the proposed redevelopment. However, Chapter 7.0 Biodiversity has predicted that following suitable mitigation, no significant impacts will occur.
	Utilities	Construction traffic, excavation works and the build out of the blocks may result in short-term localised vibration effects which could have potential to impact below ground services. Monitoring stations will be set up around the site to monitor vibration levels and ensure they are within acceptable levels.
	Cultural Heritage Architecture	There is potential for construction works and associated vibration, arising from piling and rock breaking has the potential to undermine the integrity of existing protected structures and buildings of cultural significance. Chapter 13.0 assesses the potential impact and confirms the closest protected structure to any planned piling works is at least 20m from the Flaxmill complex. The impact to protected structures is negative, not significant and short-term.
	Traffic & Transport	Traffic generation has potential to result in noise related impacts. Chapter 11.0 Noise & Vibration has been prepared in close co-operation with the Traffic Consultant. The calculated change in traffic noise associated with the addition of construction related traffic is less than 2 dB (A) along the closest access

		roundabout to the site and the predicted effects are determined as negative, not significant to slight and short-term.
Air Quality	Population & Human Health	There is potential for impact on human health arising from dust during demolition and construction. As the overall sensitivity of the area to dust-related human health effects is low, this results in a low risk of dust-related human health effects. In terms of climate
	Waste Management	Hazardous waste and material has the potential to generate asbestos fibres and release same to the air.. However, the employment of good construction management practices, and mitigation and monitoring measures (as set out in Chapter 10, Volume 2 – EIAR) will - will mean there will be no likely significant effects on air quality.
	Land & Soils	There is an overall high risk of dust-related ecological impacts as a result of the proposed demolition and construction activities. Table 14.11 provides mitigation measures for managing dust on site such that the predicted residual, dust-related, biodiversity impact of the construction phase of the proposed development is short-term, direct, negative, localised and not significant.
	Utilities	Construction of the site services have a potential interaction with air quality through impact of construction activities and dust generation. A dust minimisation plan as detailed in Chapter 14.0 will be prepared to control such emissions and ensure no significant impacts occur. The built services have an interaction with climate in the availability and use of non-greenhouse gas reliant power and heat sources. In built design mitigation addresses this interaction and ensures there is no likely significant impact as the proposed development incorporates a range of energy reduction strategies aligned with Part L 2022 for Dwellings,
	Traffic & Transport	There is the potential for vehicles accessing the site to result in emissions of NO ₂ , PM ₁₀ and PM _{2.5} . However, the proposed development will result in a limited increase in traffic. In addition, there are no proposed changes to the traffic speeds or road alignment. Operational stage effects on air quality are predicted to be imperceptible, neutral and long-term, and not significant.
Climate	Population & Human Health	There is potential for human health impacts resulting from climate change associated with greenhouse gas emissions at operational stage. However, the residual impact of the proposed development in relation to GHG

		emissions is considered negative and slight and not significant.
	Utilities	Construction of the site services have a potential interaction with air quality through impact of construction activities and dust generation. A dust minimisation plan as detailed in Chapter 14.0 will be prepared to control such emissions and ensure no significant impacts occur. The built services have an interaction with climate in the availability and use of non-greenhouse gas reliant power and heat sources. In built design mitigation addresses this interaction and ensures there is no likely significant impact as the proposed development incorporates a range of energy reduction strategies aligned with Part L 2022 for Dwellings,
	Traffic & Transport	Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO ₂) which will impact climate. However, the proposed development will result in a limited increase in traffic. In addition, there are no proposed changes to the traffic speeds or road alignment. Operational stage effects on air quality are predicted to be imperceptible, neutral and long-term, and not significant.
	Sunlight & Daylight	Good daylight and sunlight within a development reduces the need for lighting and heating resulting in a reduction on consumption of utilities and an associated positive reduction in emissions. This has a positive impact on the climate and environment.
Microclimate - Pedestrian Wind Comfort	Population & Human Health	The position and height of buildings have the potential to generate wind tunnelling which can affect the usability and enjoyment of public and private open space. Wind modelling has been undertaken and it has been demonstrated that no significant permanent negative impacts will occur.
	The Landscape	The position of trees and landscaping features have the potential to mitigate wind tunnelling which can affect the usability and enjoyment of public and private open space. Wind modelling has been undertaken and it has been demonstrated that no significant permanent negative impacts will occur
Microclimate – Daylight & Sunlight	Population & Human Health	The proposed development can impact daylight and sunlight standards and the quality of living space of adjoining residents, which can impact human health. Also, the proposed development as designed can also have daylight & sunlight implications on the health of future residents. Chapter 17.0 considers these interactions and concludes that Negligible impact is

		expected in relation to daylight and sunlight access experienced by the future inhabitants of the proposed development and to the existing inhabitants of the adjacent neighbouring buildings. No remedial or mitigation measures are proposed. The residual impacts during the operational phase are considered to be in line with the Predicted Impacts when considering daylight and sunlight to existing and proposed properties.
	Climate	Good daylight and sunlight within a development reduces the need for lighting and heating resulting in a reduction on consumption of utilities and an associated positive reduction in emissions. This has a positive impact on the climate and environment.
Material Assets: Traffic & Transport	Population & Human Health	Traffic flow for construction vehicles in the locality has potential to impact upon road safety by virtue of increased traffic volumes, albeit being temporary in nature. A Outline Construction Traffic Management Plan has been prepared to mitigate traffic impacts during construction. Traffic flow during operation within the site has the potential to create safety risks for pedestrians and cyclists, if the design does not provide for safe pedestrian / cycling environments. The development has been designed with effective pedestrian and cycling connectivity thereby encouraging safe and efficient movement within the site. A Mobility Management Plan has been prepared and will be implemented to promote alternative modes to the car.
	Cultural Heritage - Architecture	Construction traffic has the potential to collide with protected structures and existing heritage buildings of significance on the site. To mitigate this risk, it is proposed to manage construction traffic away from the Flaxmill Plaza by facilitating a temporary construction access to the Quarry Zone.
	Air Quality	There is the potential for vehicles accessing the site to result in emissions of NO ₂ , PM ₁₀ and PM _{2.5} . However, the proposed development will result in a limited increase in traffic. In addition, there are no proposed changes to the traffic speeds or road alignment. Operational stage effects on air quality are predicted to be imperceptible, neutral and long-term, and not significant.
	Waste Management	Significant waste in the form of excavated soil from the site must be removed prior to construction. Potential impacts relate specifically movement of waste associated with the construction stage. This is dealt with in Chapter 19.0.

	Climate	Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO ₂) which will impact climate. However, the proposed development will result in a limited increase in traffic. In addition, there are no proposed changes to the traffic speeds or road alignment. Operational stage effects on air quality are predicted to be imperceptible, neutral and long-term, and not significant.
	Noise & Vibration	Traffic generation has potential to result in noise related impacts. Chapter 11.0 Noise & Vibration has been prepared in close co-operation with the Traffic Consultant. The calculated change in traffic noise associated with the addition of construction related traffic is less than 2 dB (A) along the closest access roundabout to the site and the predicted effects are determined as negative, not significant to slight and short-term.
Waste Management	Population & Human Health	Management of asbestos waste during construction has the potential to impact human health and which has been carefully mitigated with an Asbestos Removal Plan to be delivered on site. Similarly waste management during operation, if not effectively managed has the potential to impact human health. This will be mitigated through measures detailed in the Operational Waste Management Plan accompanying the application for approval.
	Land Soils & Geology	Excavation of lands & soils will generate hazardous waste comprising contaminated soils which will be disposed of to a suitably licensed waste facility, with adequate capacity. If not properly managed, stored, or contained, waste materials may lead to pollution. To mitigate these risks, a carefully planned approach to waste management will be implemented in accordance with the site-specific Resource and Waste Management Plan (RWMP)
	Traffic & Transport	Significant waste in the form of excavated soil from the site must be removed prior to construction. Potential impacts relate specifically movement of waste associated with the construction stage. This is dealt with in Chapter 19.0.
	Water & Hydrogeology	Hazardous waste comprising contaminated soils and material (asbestos) will be generated following excavation and construction works. All waste soil and material will be temporarily stored on-site in designated, secure areas pending collection by a licensed waste contractor and disposed of to a suitably registered waste facility.. If not properly managed, stored, or contained, waste materials may lead to

		pollution. To mitigate these risks, a carefully planned approach to waste management will be implemented in accordance with the site-specific Resource and Waste Management Plan (RWMP). It is not considered that there will be any significant risk to water quality as a result of waste management during the operational phase, given that waste will be collected by private, licensed waste contractors and recovered, recycled or disposed of at appropriately licenced waste facilities, which will have environmental controls in place as standard.
Material Assets: Utilities	Population & Human Health	At the operational stage increased population will create greater demand on built services, placing greater demand on water requirements and the public sewer. Uisce Eireann has confirmed capacity. This is dealt with in Chapter 20.0. The potential significant impacts on human health arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative impacts will occur.
	Noise & Vibration	Construction traffic, excavation works and the build out of the blocks may result in short-term localised vibration effects which could have potential to impact below ground services. Monitoring stations will be set up around the site to monitor vibration levels and ensure they are within acceptable levels.
	Water & Hydrogeology	The construction of the proposed services (water supply, drainage and IT etc.) may affect the local hydrological and hydrogeological environment as there is a risk of suspended solids run off. During the operational phase the potential interactions include discharge of surface water and foul water. Uisce Eireann has issued a Confirmation of Feasibility with respect to wastewater discharge. This is dealt with in Chapter 20.0. Surface water will be managed on site through nature based solutions and mitigation measures prior to discharge to the reservoir on site.
	Air Quality & Climate	Construction of the site services have a potential interaction with air quality through impact of construction activities and dust generation. The built services have an interaction with climate in the availability and use of non-greenhouse gas reliant power and heat sources.

22.3.2 Risk Management

There are interactions with Population and Human Health, Land, Soils, Geology and Hydrogeology, Surface Water, Noise, Climate and Air, Material Assets, Traffic and Transport, Landscape and Visual,

and Cultural Heritage. However, subject to implementation of mitigation measures, good working practices and codes, the interactions between these areas have been sufficiently considered in relation to risk management.

The potential significant impacts on risk management arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant temporary or permanent residual negative impacts will occur.

22.4 INTERACTIONS & CUMULATIVE IMPACTS

Each Chapter of the EIAR includes a cumulative impact assessment of the proposed development with the proposed Masterplan development (Phases III & IV) and other relevant existing plans and projects and/or approved projects in the area. The potential cumulative impacts primarily relate to traffic, dust, noise and other nuisances from the construction of the development, with other planned or existing projects, and each of the EIAR chapters has regard to these in the assessment and mitigation measures proposed.

The potential cumulative significant effects through interactions have been considered and there are no significant potential for cumulative significant effects to arise from multiple non-significant effects.

22.5 SUMMARY

As outlined above, the proposed development has the potential to impact on various environmental aspects, with interactions and inter-relationships between these aspects as described above. The EIAR has considered these interactions and inter-relationships throughout the appraisal, firstly through the design and layout of the proposed developments, to avoid impacts where possible, and also in the definition of suitable mitigation measures to minimise the impacts.

22.6 REFERENCES

- Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), EPA 2003
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, EPA, 2022.
- EU Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions. 1999
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DoECLG, March 2013).