

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

VOLUME II ADDENDUM



PROPOSED RESIDENTIAL DEVELOPMENT

AT

Newcastle South, Phase 2B LRD Newcastle, Co. Dublin

Prepared by



In Conjunction with

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LIST OF ABBREVIATIONS

AA	Appropriate Assessment	IFI	Inland Fisheries Ireland
ABP	An Bord Pleanála	LAP	Local Area Plan
CDP	County Development Plan	LRD	Large Scale Residential Development
CEMP	Construction Environmental Management Plan	NHA/pNHA	Natural Heritage Area / proposed Natural Heritage Area
CA	Competent Authority (South Dublin County Council/An Bord Pleanála)	NIAH	National Archive of Architectural Heritage
CSO	Central Statistics Office	NPWS	National Parks and Wildlife Service
DAHG	Department of Arts, Heritage and the Gaeltacht	NRA	National Roads Authority
DCENR	Department of Communications, Energy and Natural Resources	NPF	National Planning Framework
DEHLG	Department of Housing, Planning and Local Government	OPW	Office of Public Works
EIA	Environmental Impact Assessment	PBSA	Purpose-Built Student Accommodation
EIAR	Environmental Impact Assessment Report	RMP	Record of Monuments and Places
EMP	Environmental Management Plan	RPB	Regional Planning Guidelines
EPA	Environmental Protection Agency	RPS	Record of Protected Structures
ESRI	Economic and Social Research Institute	SAC	Special Area of Conservation
GDP	Gross Domestic Product	SDCC	South Dublin County Council
GSI	Geology Survey Ireland	SMR	Sites and Monuments Record
IAA	Irish Aviation Association	SPA	Special Protection Area
IEEM	Institute of Ecology and Environmental Management	SHD	Strategic Housing Development
		SUDS	Sustainable Drainage System
		TMP	Traffic Management Plan
		WFD	Water Framework Directive

GLOSSARY OF TERMS¹

Alternatives A description of other options that may have been considered during the conception of a project; these include alternative locations, alternative designs and alternative processes.

Baseline Scenario The current state of environmental characteristics – including any evident trends in its status.

Competent Authority (CA) The term ‘competent authority’ means the Minister or public authority to which an EIAR is required to be submitted, i.e. the authority charged with examining an EIAR with a view to issuing a consent to develop or operate.

Development A project involving new works [including alteration and/or demolition] or altered patterns of activity.

‘Do-nothing’ Scenario The situation or environment which would exist if a proposed, development, project or process were not carried out. This scenario needs to take account of the continuation or change of current management regimes, as well as the continuation or change of trends currently evident in the environment.

Effect / Impact A change resulting from the implementation of a project.

Environmental Impact Assessment – EIA The process of examining the anticipated environmental effects of a proposed project – from consideration of environmental aspects at design stage, through consultation and preparation of an Environmental Impact Assessment Report (EIAR), evaluation of the EIAR by a competent authority, and the subsequent decision as to whether the project should be permitted to proceed, encompassing public response to that decision.

Environmental Impact Assessment Report – EIAR A report or statement of the effects, if any, that the proposed project, if carried out, would have on the environment. EPA The Environmental Protection Agency.

Impact / Effect A change resulting from the implementation of a project

Impact Avoidance The modification of project decisions (about site location or design, for example) having regard to predictions about potentially significant environmental effects.

Infrastructure The basic structure, framework or system which supports the operation of a project, for example roads and sewers, which are necessary to support development projects.

Land Use The human activities which take place within a given area of space.

Likely Effects (or Likely Impacts) The effects that are specifically predicted to take place – based on an understanding of the interaction of the proposed project and the receiving environment. (See also Potential Effects and Residual Effects.)

Methodology The specific approach or techniques used to analyse impacts or describe environments.

Mitigation Measures Measures designed to avoid, prevent or reduce impacts. These measures can mitigate impacts: \ by Avoidance When no impact is caused (often through consideration of alternatives).

¹ Selected – From Guidelines on the information to be contained in Environmental Impact Assessment Reports – EPA, May 2022

\ by *Prevention* When a potential impact is prevented by a measure to avoid the possibility of the impact occurring. \ by *Reduction* When an impact is lessened.

Monitoring The observation, measurement and evaluation of environmental data to follow changes over a period of time, to assess the efficiency of control measures and to record any unforeseen effects in order to be able to undertake appropriate remedial action. This is typically a repetitive and continued process carried out during construction, operation or decommissioning of a project.

Pathway The route by which an effect is conveyed between a source and a receptor.

Planning Application Report Documentation that accompanies the planning application which describes the conformity of the proposal with relevant legislation and planning matters – such as the County, City or Local Area Plans – and sectoral policies, as well as social and economic activity.

Pollution Any release to the environment which has a subsequent adverse effect on the environment or man.

Potential Effect/ Impact The effect / impact that would occur without mitigation.

Processes The activities which take place within a project.

Project For the purposes of the Guidelines, the term project is used to encompass all of the various forms of development, works and activity which are subject to EIA requirements, as set out in the relevant legislation and as understood by the Directive.

Sensitivity The potential of a receptor to be significantly affected. **Significance (of impact)** The importance of the outcome of the impact (or the consequence of change) for the receiving environment. **Source** The activity or place from which an effect originates.

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1.0 INTRODUCTION AND METHODOLOGY

This Environmental Impact Assessment Report (EIAR) addendum relates to the inclusion of additional mitigation in respect of the Further Information request from South Dublin County Council relating to

- Chapter 5 – Water and Hydrology.

2.0 SUMMARY OF EIA MITIGATION AND MONITORING MEASURES

2.1 INTRODUCTION

The central purpose of EIA is to identify potentially significant adverse impacts at the pre-consent stage and to propose measures to mitigate or ameliorate such impacts. This chapter of the EIAR document has been prepared by John Spain Associates and sets out a summary of the range of methods described within the individual chapters of this EIAR document which are proposed as mitigation and for monitoring. It is intended that this chapter of the EIAR document will provide a useful and convenient summary to the competent/consent authority of the range of mitigation and monitoring measures proposed. This chapter of the EIAR was prepared by Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt., Executive Director with John Spain Associates.

EIA related conditions are normally imposed by the competent/consent authority as part of conditions of planning consent and form a key part of the Impact Anticipation and Avoidance strategy. Conditions are principally used to ensure that undertakings to mitigate are secured by explicitly stating the location, quality, character, duration and timing of the measures to be implemented. A secondary role of EIA related conditions is to ensure that resources e.g. bonds / insurances will be available and properly directed for mitigation, monitoring or remedial action, in the event that the impacts exceed the predicted levels.

Monitoring of the effectiveness of mitigation measures put forward in the EIAR document, both by the competent authorities and the developer, is also an integral part of the process. Monitoring of environmental media and indicators arise either from undertakings or from conditions.

In the case of mitigation and monitoring measures it is important for all parties to be aware of the administrative, technical, legal and financial burdens that can accompany the measures proposed. It is also important to ensure that, where monitoring is provided for, it is clearly related to thresholds, which if exceeded cause a clearly defined set of actions to be implemented.

2.2 MITIGATION STRATEGIES

2.2.1 Introduction

There are three established strategies for impact mitigation - avoidance, reduction and remedy. The efficacy of each is directly dependent on the stage in the design process at which environmental considerations are taken into account (i.e. impact avoidance can only be considered at the earliest stage, while remedy may be the only option available to fully designed projects).

2.2.2 Mitigation by Avoidance

Avoidance is generally the fastest, cheapest and most effective form of impact mitigation. Environmental effects and consideration of alternatives have been taken into account at the earliest stage in the project design processes. The consideration of alternatives with respect to the development of the subject lands has been described in Chapter 2.

2.2.3 Mitigation by Reduction

This is a common strategy for dealing with effects which cannot be avoided. It concentrates on the emissions and effects and seeks to limit the exposure of the receptor. It is generally regarded as the "end of pipe" approach because it does not seek to affect the source of the problems (as do avoidance strategies above). As such this is regarded as a less sustainable, though still effective, approach.

2.2.4 Reducing the Effect

This strategy seeks to intercept emissions, effects and wastes before they enter the environment. It monitors and controls them so that acceptable standards are not exceeded. Examples include wastewater treatment, filtration of air emissions and noise attenuation measures.

2.2.5 Reducing Exposure to the Impact

This strategy is used for impacts which occur over an extensive and undefined area. Such impacts may include noise, visual impacts or exposure to hazard. The mitigation is effected by installing barriers between the location(s) of likely receptors and source of the impact (e.g. sound barriers, tree screens or security fences).

2.2.6 Mitigation by Remedy

This is a strategy used for dealing with residual impacts which cannot be prevented from entering the environment and causing adverse effects. Remedy serves to improve adverse conditions which exist by carrying out further works which seek to restore the environment to an approximation of its previous condition or a new equilibrium.

2.2.7 Mitigation and Monitoring Measures

The following provides a list, for ease of reference, of the mitigation and monitoring measures recommended in each chapter of the EIAR.

2.3 PROJECT DESCRIPTION & ALTERNATIVES EXAMINED

2.3.1 Construction Management Strategy

It is envisaged that the development of the lands subject of the proposed development will occur over a 48-54 month period (of up to 5 years to allow for the potential for some pauses to allow for flexibility). Given the nature of the project and the need for flexibility to respond to market demand, the development phases are indicative. A Construction Environment Plan has been prepared by DBFL Consulting Engineers, has been reviewed by the relevant EIAR consultants and is included in Appendix D. This CEMP will be developed by the Contractor to include the mitigation contained in the EIAR.

2.3.1.1 Construction Traffic Management Plan

A Construction Traffic Management Plan (CTMP) will be prepared by the main contractor and agreed with the Planning Authority prior to commencement of development in the event of a grant of permission. It will contain the mitigation in the EIAR and the CEMP (see appendix D Volume III of the EIAR).

2.4 POPULATION AND HUMAN HEALTH

POP & HH CONST 1:

In order to protect the amenities enjoyed by nearby residents, premises and employees a Construction Environment Management Plan (CEMP) will be submitted by the contractor and implemented during the construction phase and it will contain the mitigation measures in this EIAR.

With reference to the construction phase of the proposed development, the objectives of the Construction Waste By Products Management Plan prepared by AWN (and also Chapter 11 of the EIAR) is to ensure that waste generated during the proposed construction and operation phases will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts 1996 (as amended) are complied with.

2.4.1 Operational Phase

The operational phase is considered to have likely positive impacts on population in relation to the provision of additional residential units, open space, childcare provision, to cater for the demands of a growing population in accordance with the residential zoning objectives pertaining to the site.

During the operational phase of the development the design of the scheme has undergone a Road Safety Audit and has had regard to Design Manual for Urban Roads and Streets (DMURS) during its design. This will promote a pedestrian friendly environment, promoting sustainable development and reducing the influence of cars. This has the potential to reduce accidents within the proposed development.

No further specific mitigation is required having regard to the mitigation included within the other chapters of this EIAR. In relation to the impact of the development on population and human health it is considered that the monitoring measures outlined in this EIAR in regard to the other environmental topics such as water, air quality and climate and noise and vibration sufficiently address monitoring requirements.

2.5 BIODIVERSITY

2.5.1 Mitigation Measures & Monitoring

Construction and operational controls will be incorporated into the proposed development project to minimise the potential negative impacts on the ecology within the Zone of Influence (Zoi). These measures are outlined in detail in Table 4.9.

2.5.1.1 Designated Conservation sites within 15km

No specific measures are required to protect designated sites. However, the project must comply with Water Pollution legislation to ensure that there are no contaminated discharges from the site including surface runoff leading to the marine environment. However, these measures are not necessary for the protection of designated sites.

2.5.1.2 Development Construction

Contamination of watercourses could potentially occur from silt, runoff and dust. As an existing road surface water network is located at Athgoe Road, the Griffeen River is located to the East of the site, and substantial works are proposed, a robust surface water runoff prevention strategy will be in place. All mitigation measures outlined in Table 4.9 will be carried out in consultation with and to the satisfaction of the project ecologist.

All works on site will have sufficient mitigation measures to prevent silt from runoff during works (Table 4.9). This will include measures outlined by the project ecologist including silt fences, phasing of the project and landscaping at early stage of the project to limit surface runoff. These measures are not necessary for the protection of designated sites.

Table 2.1: Sensitive Receptors/effects and mitigation measures.

Sensitive Receptors	Potential Effects	Designed-in Mitigation
Downstream impacts on watercourses	<ul style="list-style-type: none"> Habitat degradation Dust deposition Pollution Silt ingress from site runoff Downstream impacts Negative impacts on aquatic and bird fauna 	<ul style="list-style-type: none"> Appointment of a project ecologist to oversee works. Local silt traps established throughout site. Mitigation measures on site include dust control, stockpiling away from drains Stockpiling of loose materials will be kept to a minimum of 20m from drains.

Sensitive Receptors	Potential Effects	Designed-in Mitigation
	<ul style="list-style-type: none"> Impacts from concrete works 	<ul style="list-style-type: none"> Stockpiles and runoff areas following clearance will have suitable barriers to prevent runoff of fines into the drainage system. Fuel, oil and chemical storage will be sited within a bunded area. The bund will be at least 50m away from drains, ditches, excavations and other locations where it may cause pollution. Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. Any water-filled excavations, including the attenuation tank during construction, that require pumping will not directly discharge to the surface water network. Prior to discharge of water from excavations adequate filtration will be provided to ensure no deterioration of water quality. Concrete works will be mitigated to prevent concrete or cement from entering drains or pathways to watercourses/marine environment. Mitigation measures on site include dust control, stockpiling away from drains During the construction works silt traps will be put in place in the vicinity of all runoff channels to prevent sediment entering the surface water network. Petrochemical interception and bunds in refuelling area Maintenance of any drainage structures (e.g. de-silting operations) must not result in the release of contaminated water to the surface water network. No entry of solids to the drainage network during the connection of pipework to the public water system <ul style="list-style-type: none"> Dewatering of excavations may be necessary. Appropriate monitoring of groundwater levels during site works will be undertaken. Construction phase filtering of surface water for suspended solids will be carried out in compliance with Water Pollution legislation. Concrete trucks, cement mixers or drums/bins are only permitted to wash out in designated wash out area greater than 50m from sensitive receptors including drains and stream.
Biodiversity	<ul style="list-style-type: none"> Habitat Degradation and removal <ul style="list-style-type: none"> Dust deposition <ul style="list-style-type: none"> Pollution Silt ingress Potential downstream impacts. 	<p>Air & Dust</p> <p>Mitigation measures will be carried out reduce dust emissions to a level that avoids the possibility of adverse effects. The main activities that may give rise to dust emissions during construction include the following:</p> <ul style="list-style-type: none"> Excavation of material; Materials handling and storage; Movement of vehicles (particularly HGV's) and mobile plant. <ul style="list-style-type: none"> Contaminated surface runoff <p><i>Mitigation measures to be in place:</i></p> <ul style="list-style-type: none"> Maintain a 10m buffer from drains with a double layer of silt fences Road sweeping to clean roads proximate to the site <ul style="list-style-type: none"> Wheel wash on site. Consultation will be carried with an ecologist throughout the construction phase;

Sensitive Receptors	Potential Effects	Designed-in Mitigation
		<ul style="list-style-type: none"> Trucks leaving the site with excavated material will be covered so as to avoid dust emissions along the haulage routes. Speed limits on site (15kmh) to reduce dust generation and mobilisation. <p><i>Site Management</i></p> <ul style="list-style-type: none"> Regular inspections of the site and boundary should be carried out to monitor dust, records and notes on these inspections should be logged. Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. Make the complaints log available to the local authority when asked. Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book. <p><i>Monitoring</i></p> <ul style="list-style-type: none"> Undertake daily on-site and off-site inspection. This should include regular dust soiling checks of surfaces within 100 m of site boundary, integrity of the silt control measures, with cleaning and / or repair to be provided if necessary. <p><i>Preparing and Maintaining the Site</i></p> <ul style="list-style-type: none"> Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. Fully enclose specific operations where there is a high potential for dust production and the site is active for an extensive period. <ul style="list-style-type: none"> Avoid site runoff of water or mud. Keep site fencing, barriers and scaffolding clean using wet methods. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. <ul style="list-style-type: none"> Cover, seed or fence stockpiles to prevent wind whipping. Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic. Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions. <p><i>Waste</i></p> <ul style="list-style-type: none"> Avoid bonfires and burning of waste materials. <p><i>Measures Specific to Earthworks</i></p> <ul style="list-style-type: none"> Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.

Sensitive Receptors	Potential Effects	Designed-in Mitigation
		<ul style="list-style-type: none"> • Only remove the cover in small areas during work and not all at once. • During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust. <p><i>Storage/Use of Materials, Plant & Equipment</i></p> <ul style="list-style-type: none"> • Materials, plant and equipment shall be stored in the proposed site compound location; • Plant and equipment will not be parked within 50m of the Dawson's Demesne Stream at the end of the working day; • Hazardous liquid materials or materials with potential to generate run-off shall not be stored within 50m of the drains. • All oils, fuels and other hazardous liquid materials shall be clearly labelled and stored in an upright position in an enclosed bunded area within the proposed development site compound. The capacity of the bunded area shall conform with EPA Guidelines – hold 110% of the contents or 110% of the largest container whichever is greater; • Drip trays will be turned upside down if not in use to prevent the collection of rainwater; • Waters collected in drip trays must be assessed prior to discharge. If classified as contaminated, they shall be disposed by a permitted waste contractor in accordance with current waste management legal and regulatory requirements; • Plant and equipment to be used during works, will be in good working order, fit for purpose, regularly serviced/maintained and have no evidence of leaks or drips; • No plant used shall cause a public nuisance due to fumes, noise, and leakage or by causing an obstruction; • Re-fuelling of machinery, plant or equipment will be carried out in the site compound as per the appointed Construction Contractor re-fuelling controls; <p><i>Surface water upgrade works along public road</i></p> <ul style="list-style-type: none"> • It is recommended that prior to any excavation works within the roadway occurring, a site meeting between the arboricultural consultant and main contractor is carried out. The purpose of the meeting will be to identify any potential areas of risk and to specify any special construction methods that will be required to safeguard trees and hedgerows during the proposed works. These methods will be outlined within a works specific method statement for the main contractor (and included in the CEMP). • To ensure that the minimum impact is caused to the roadside trees and hedgerows, the new surface water outfall must be installed within the footprint of the existing road, ideally in the centre. No excavation works are permitted to be carried out within the grass verges (save for tie in).
Birds	<ul style="list-style-type: none"> • Removal nesting habitat. 	<ul style="list-style-type: none"> • Removal of potential nesting habitats outside of bird breeding season (March to August inclusive). Should this

Sensitive Receptors	Potential Effects	Designed-in Mitigation
(National Protection)	<ul style="list-style-type: none"> • Removal foraging habitat. • Destruction and/or disturbance to nests (injury/death). <ul style="list-style-type: none"> • Predation • Disturbance 	<p>not be possible, a pre-works check by a qualified ecologist should be undertaken to ensure nesting birds are absent. If nesting birds are present a derogation licence will be sought from NPWS. If this is not forthcoming works to remove the nesting habitats will not commence within bird nesting season.</p> <ul style="list-style-type: none"> • An ecologist will be on site during site clearance to minimise impact on foraging/roosting bird species. The ecologist will have the ability to cease works on site that could cause disturbance, in the event of significant disturbance impacts being possible.
Bats	<ul style="list-style-type: none"> • Loss of commuting habitat. • Injury/death during construction and operation 	<ul style="list-style-type: none"> • No roosts or potential roosts will be impacted. The foraging areas for bats along hedgerows will be temporarily lost until the trees within the green link area become mature and allow for insects to swarm. A post construction assessment will be carried out in the open space areas to ensure compliance with Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers.

2.5.2 Monitoring

An Ecologist will be appointed to monitor the Site from pre-construction surveys, during Construction Phases and Post Construction. This would include obtaining derogation licenses, if necessary, from the National Parks and Wildlife Service (NPWS). The landscaping of the site will be monitored by the appointed ecologist.

2.6 LAND AND SOILS

2.6.1 Incorporated Design Mitigation

Mitigation included in the design of the proposed development include:

- Proposed development levels are designed to minimise cut/fill type earthworks and volume of material to be disposed off-site where possible.
- Landscaping works for the development when incorporated into the scheme are designed to protect the soils again from weathering and erosion.
- Design of site services / drainage works are in accordance with the relevant design guidance such as the GDSDS, The SUDS Manual (CIRIA C753) and the Irish Water Code of Practice (IW-CDS-5030-03 Revision 2).
- Excavated material to be removed off-site is undertaken to the relevant EPA licensing requirements.
- Landscaping works for the development when incorporated into the scheme are designed to protect the soils again from weathering and erosion.
- Appropriately designed site services / drainage / sewers will protect the soils and geology from risk of contamination arising from the development such as light liquids separator or SuDS treatment train approach.

2.6.2 Construction Phase Mitigation

A Construction Environmental Management Plan (CEMP) is included with the planning application (contained in Appendix D2 Volume III of the EIAR). This plan will be developed further by the

contractor into a Construction Management Plan for the construction phase, which will include the mitigation measures contained in the EIAR. The CEMP includes a range of site specific measures which will include the following mitigation measures in relation to soils:

- Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter watercourses.
- Topsoil stockpiles will be located on site so as not to necessitate double handling.
- Topsoil to be re-used throughout the development in landscaping and public open spaces / linear park.
- Disturbed subsoil layers to be stabilised as soon as practicable - backfilling of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping, to be carried out promptly to minimise the duration that subsoil layers are exposed to the effects of weather and construction vehicles.
- Stockpiles of excavated subsoil material to be protected for the duration of the works and located separate to the topsoil stockpiles.
- Construction site mitigation such as wheel wash and dust suppression measures to be implemented.
- Measures to capture and treat sediment laden surface water runoff especially from excavations and stripped land to be implemented (e.g. sediment tanks, surface water inlet protection and earth bunding adjacent to open drainage ditches).
- Where feasible, excavated subsoil material to be reused as part of the site development works (e.g. for landscaping works and for backfill to trenches under non-trafficked areas).
- Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes on the site and entering the site.
- All oils, fuels, paints and other chemicals to be stored in a secure bunded hardstanding area.
- Refuelling and servicing of construction machinery to take place in a designated hardstanding area, remote from surface water inlets (when it is not possible to carry out such activities off-site).
- Good housekeeping (site clean-ups, use of disposal bins, etc.) on the site project.
- Any material removed from site shall be classified before removal to ensure it is disposed of to an appropriately licensed landfill or recovery facility in accordance with The Waste Management (Hazardous Waste) Regulations 1998. Unsuitable material that cannot be reused on site to be disposed off-site under license.
- Where bedrock / boulders are encountered in excavations, option to crush and reuse to be considered depending on quantity of material excavated. Screened material may be reused as a fill material e.g. in road construction and backfill to service trenches.
- Where feasible, excavated material will be reused as part of the site development works (e.g. use as fill material beneath roads) however, unsuitable excavated subsoil is expected and will have to be removed to an approved landfill.

All fill and aggregate imported for use on the proposed development site will be sourced from reputable suppliers. All suppliers will be vetted for:

- Aggregate compliance certificates/declarations of conformity for the classes of material specified for the project;
- Environmental Management status;
- Regulatory and Legal Compliance status of the Company.

2.6.3 Operational Phase

Mitigation measures envisaged during the operational phase comprise;

- Ensuring regular maintenance of site services, SuDS features and attenuation systems such that they operate as designed.
- Emptying oil separators as per manufacturer's operation and maintenance recommendations to mitigate against risk of spillage / leaks into the soils.

2.6.4 Monitoring

Construction phase monitoring relates to the good maintenance of mitigation measures outlined above in section 5.6 including the CEMP contained in Appendix D2 Volume III of this EIAR. Soil removed during the construction phase is to be monitored to maximise potential for re-use on site. Monitoring of any hazardous material stored on-site forms part of the Construction & Demolition Waste and By-Product Management Plan, included in the LRD application and Chapter 11 of this EIAR Material Assets Waste Management . A dust management/monitoring programme is included in Appendix C 7.2 Volume III of the EIAR.

2.6.4.1 Monitoring measures – construction

Proposed monitoring during the construction phase in relation to the soil and geological environment are as follows:

- Contractors will adhere to the mitigation in this EIAR and CEMP in Appendix D2 Volume III of this EIAR.
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road sub-formation level in advance of placing capping material, stability of excavations etc.).
- Inspection of fuel / oil storage areas.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill; protection of soils from contamination for removal from site)
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.)
- Soil removed during the construction phase will be monitored to maximise potential for re-use on site. Any contaminated soil encountered and not identified on site investigations will be analysed and disposed off-site at a suitable licensed facility.
- The quantities of topsoil, subsoil and rock removed off site will be recorded.

2.7 WATER, HYDROLOGY, HYDROGEOLOGY

2.7.1 Incorporated Design Mitigation

- Excavated material to be contained to ensure excavated material (from earthworks) does not enter a drainage ditch or watercourse.
- Any in-situ concrete work to be lined and areas bunded (where possible) to stop any accidental spillage entering the watercourse.
- Design of site services / drainage works are in accordance with the relevant design guidance.
- Appropriately designed site services / drainage / sewers will protect the water, hydrogeology and hydrology from risk of contamination arising from the development such as light liquids separator or SuDS treatment train. Features such as permeable paving, swales, tree pits and above ground and open-bottom attenuation are proposed to intercept pollutants and promote groundwater recharge where possible. A bypass separator is proposed prior to any surface water discharging to drainage ditches.

- Design and layout of the scheme is aimed at maximising SuDS features and protect watercourses in accordance with guidance from Inland Fisheries Ireland on the Planning for Watercourses in the Urban Environment.
- Surface water drainage for the development has been designed in accordance with the GDSDS and the SUDS Manual to avoid risk to human health.
- Surface water runoff from the development will be attenuated to greenfield runoff rates (Qbar) in accordance with the Greater Dublin Strategic Drainage Study (GDSDS). This will mimic the undeveloped scenario which should mitigate flood risk to the receiving watercourses.
- A total of 1,784m³ of surface water storage will be provided within the attenuation facilities to store surface water for storms between the 5, 30 year and the 100 year critical storms.
- In accordance with the GDSDS it is proposed to use Sustainable Urban Drainage systems (SUDS) for managing storm-water for the proposed development. The aim of the SUDS strategy for the site will be to; attenuate storm-water runoff, reduce storm-water runoff, reduce pollution impact, replicate the natural characteristics of rainfall runoff for the site, recharge the groundwater profile. An extensive SUDS proposal is proposed as part of this application.

2.7.2 Construction Phase Mitigation

To minimise the impact of the construction phase on the water environment mitigation measures included in section 6.6.2 and the CEMP (contained in Appendix D2 Volume II of this EIAR) will be implemented.

2.7.2.1 General site works

- A Site Specific Construction and Environment Management Plan will be developed and implemented during the construction phase. Site inductions to include reference to the procedures and best practice as outlined in the CEMP, prepared by DBFL Consulting Engineers, submitted with the LRD application and will include mitigation measures contained in the EIAR.
- Measures will be implemented to capture and treat sediment laden surface water runoff from excavated trenches and stripped land (e.g. sediment tanks, surface water inlet protection and earth bunding adjacent to open drainage ditches).
- Weather conditions and seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.
- The extent of sub-soil and topsoil stripping will be minimised to reduce the rate and volume of the run-off during construction until the topsoil and vegetation are replaced.
- Concrete batching will take place off site or in a designed area with an impermeable surface.
- Concrete wash down and wash out of concrete trucks will take place on-site into an appropriate washout facility.
- Discharge from any vehicle wheel wash areas will be directed to on-site settlement tanks/ponds.
- Oil and fuel stored on site for construction will be stored in designated areas. These areas will be bunded and should be located away from surface water drainage and features.
- Refuelling and servicing of construction machinery to take place in a designated hardstanding area, remote from surface water inlets (when it is not possible to carry out such activities off-site).
- Any hazardous materials to be stored within secondary containment designed to retain at least 110% of the storage contents - to prevent the accidental release (fuels, paints, cleaning agents, etc.) with bunds for oil/diesel storage tanks.
- Spill kits will be kept in designated areas for re-fuelling of construction machinery.
- Dewatering measures will only be employed where necessary.

2.7.3 Operational Phase

Operational phase mitigation measures are noted below:

- The design of proposed site levels (roads, FFL etc.) has been carried out to replicate existing surface contours, break lines etc. and therefore replicating existing overland flow paths, and not concentrating additional surface water flow in a particular location.
- Surface water runoff from the site will be attenuated to the greenfield runoff rate as recommended in the Greater Dublin Strategic Drainage Study (GDSDS). Surface water discharge rates will be controlled by a Hydrobrake flow control device, with a combination of above ground ponds, low flow channels and swales provided to store runoff from a 1 in 100-year return period event. SUDS features are implemented in the surface water drainage network to reduce the rate of runoff from hard standing area sand to improve the quality of surface water runoff. For detailed information refer to DBFL Report number 210026-DBFL-CS-SP-RP-C-1001, "Infrastructure Design Report".
- Surface water runoff from the development will be collected by an appropriately designed system with contaminants removed prior to discharge i.e. petrol interceptor.
- A regular maintenance and inspection programme of the flow control devices, attenuation storage facilities, gullies, petrol interceptor and foul pumping station will be required during the Operational Phase to ensure the proper working of the development's networks and discharges.
- Waste generated by the everyday operation of the development should be securely stored within designated collection areas with positive drainage collection systems to collect potential runoff.
- Operational waste will be removed from site using licensed waste management contractors.

Proposed mitigation measures to address residual flood risks are summarized below;

- M1. Proposed drainage system to be maintained on a regular basis to reduce the risk of a blockage.
- M2. In the event of storms exceeding the 100-year design capacity of the drainage system, then possible flood routing for overland flows towards the drainage outfalls should not be blocked.
- M3. The proposed culvert from the overland flow shall be designed for the 1:100 year storm plus 20% allowance for climate change. The culvert shall be maintained on a regular basis to reduce the risk of a blockage.
- M4. Implement the ditch and culvert upgrades as set out DBFL Technical Note 210026-TN-004 Drainage Outfall Assessment. It is proposed to conduct these upgrades in conjunction with South Dublin County Council.

2.8 MONITORING

Construction phase monitoring relates to the good maintenance of mitigation measures outlined above in section 6.6 including the Construction and Environmental Management Plan (CEMP) (see Appendix D2 Volume III of the EIAR). It is recommended that any monitoring of any hazardous material stored on-site be carried out in accordance with the CEMP.

2.8.1 Construction Phase

- Contractors will adhere to the CEMP and Mitigation Measures contained in this EIAR.
- Construction monitoring of the works (e.g. inspection of services and SUDS installation and backfill, stability of excavations etc.).
- Inspection of fuel / oil storage areas.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill; protection of soils from contamination for removal from site)
- Monitoring sediment control measures (sediment retention tanks, surface water inlet protection etc.)

2.8.2 Operational Phase

Proposed monitoring during the operational phase in relation to the water and hydrogeological environment are as follows:

- The taking in charge of the water infrastructure will ensure the system is regularly inspected and maintained.
- The performance of all SuDS features will be monitored by the relevant authorities during the life of the development.
- Monitoring of the installed hydrobrake, interceptor and gullies and all other SUDs features will be carried out to prevent contamination and increased runoff from the site.
- Monitoring of installed Foul sewers.

2.9 AIR QUALITY AND CLIMATE

2.9.1 Construction Phase

2.9.1.1 Air Quality

The proposed development has been assessed as having a medium risk of dust soiling impacts and a low risk of dust related human health impacts during the construction phase as a result of earthworks, construction and trackout activities (see Section **Error! Reference source not found.**). Therefore, the following dust mitigation measures shall be implemented during the construction phase of the proposed development. These measures are appropriate for sites with a medium risk of dust impacts and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. The mitigation measures draw on best practice guidance from Ireland (DCC, 2018), the UK (IAQM (2023), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the overall Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities.

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community engagement includes explaining the nature and duration of the works to local residents and businesses.
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details.

Site Management

- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. Dry and windy conditions are favourable to dust suspension therefore mitigations must be implemented if undertaking dust generating activities during these weather conditions.
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out.

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Avoid site runoff of water or mud.

- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicles / Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 15 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g., suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.

Measures Specific to Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

Measures Specific to Trackout

- A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

Monitoring

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

7.1.1.1 Climate

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. Measures to reduce the embodied carbon of the construction works include:

- Creating a construction program which allows for sufficient time to determine reuse and recycling opportunities for demolition wastes;
- Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled;
- Materials will be reused on site within the new build areas where possible;
- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods;
- Ensure all plant and machinery are well maintained and inspected regularly;
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site; and
- Sourcing materials locally where possible to reduce transport related CO₂ emissions.

7.1.2 Operational Phase

7.1.2.1 Air Quality

There is no mitigation required for the operational phase of the development as impacts to air quality are predicted to be neutral and imperceptible.

7.1.2.2 Climate

A number of measures have been incorporated into the design of the development in order to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the proposed development to climate change (see Section **Error! Reference source not found.**).

The proposed development has been designed to reduce the impact on climate as a result of energy usage during operation. The Energy Statement prepared by DBFL and submitted under separate cover with this planning application details a number of incorporated design mitigation measures that have been incorporated into the design of the development to reduce the impact on climate wherever possible. Such measures included in the proposed development to reduce the impact to climate from energy usage are:

- A2/A3 BER rating;
- Compliance with energy efficiency and carbon performance and thermal bridging ratings for Apartments to Part L 2021/ NZEB;
- Achieve air tightness standards of less than 3 m³/m²/hr;
- Ensure thermal bridging details are designed to meet the performance range of between 0.04 – 0.15;
- Building fabric u-value and g-value calculations will be completed to at least meet the requirements of NZEB in relation to thermal performance;
- Lighting will be designed to limit the energy required and effect on surrounding environment including existing flora and fauna. External lighting will comply with the latest standards;
- Exhaust air to water heat pumps are proposed for the heating requirements for the residential apartment units with air-source heat pumps installed in the houses. Time clocks and thermostats for each heating / hot-water zone to be fitted;
- Where possible, take quantitative performance approaches to and satisfy minimum standards for daylight provisions as outlined in 'Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities (March 2018)' and in guides like the BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting'. This will reduce requirement for continuous daylighting;
- Provide an appropriate combination of technologies to ensure energy consumption is in line with Part L 2022 Dwellings requirements (Renewable Energy Ratio (RER) > 0.10);
- Install 'infrastructure' for E.V charging for residential buildings with more than 10 car parking spaces, to allow for future installation of recharging points;
- A domestic waste management strategy will be in place, with grey, brown and green bin distinction. Composting and glass bins will be provided throughout;
- Durable building materials with long life cycles will be selected to prevent the need for frequent replacement or maintenance, thereby reducing the embodied footprint of the development. All timber will be from sustainable sources;
- Access to public transport and reduced reliance on private transport has been considered as the application site is near established rail and bus transport services as well as established social and community services;
- Bicycle parking and storage has been generously provided in the proposed scheme. Externally located stands are used for visitors to all multi-person dwelling blocks and internal secure storage to all residents. Houses have generous external bike storage to the front of each dwelling in lieu of a car parking space; and
- The project architects and landscape architects worked together to produce a plan that includes for green infrastructure (links) across the site for pedestrian and cycle use and minimised the requirement for removal or import of any soils off this site necessitating additional traffic and transport.

These identified measures will aid in reducing the impact to climate during the operational phase of the proposed development in line with the goals, relevant policies and objectives of the Dún Laoghaire-

Rathdown County Development Plan 2022-2028 and Climate Change Action Plan, including climate mitigation measures. Further details on some of the incorporated design measures can be found in the Energy Statement prepared by DBFL in respect of this planning application.

2.9.2 Monitoring

2.9.2.1 Construction Phase

Air Quality

Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/m²/day during the monitoring period of 30 days (+/- 2 days).

Climate

There is no proposed monitoring during the construction phase.

2.9.2.2 Operational Phase

Air Quality

There is no proposed monitoring during the operational phase.

Climate

There is no proposed monitoring during the operational phase.

2.10 NOISE AND VIBRATION

2.10.1 Construction Phase

With regard to construction activities, best practice control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) *Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2*. Whilst construction noise and vibration impacts are expected to vary during the construction phase depending on the distance between the activities and noise sensitive buildings, the contractor will ensure that all best practice noise and vibration control methods will be used, as necessary in order to ensure impacts at off-site noise sensitive locations are minimised.

The best practice measures set out in BS 5228 (2009 +A1 2014) Parts 1 and 2 includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- selection of quiet plant;
- noise control at source;
- screening;
- liaison with the public, and;
- monitoring.

Detailed comment is offered below on these items. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise and vibration monitoring, where required.

2.10.1.1 Selection of Quiet Plant

This practice is recommended in relation to static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.

2.10.1.2 Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

Referring to the potential noise generating sources for the works under consideration, the following best practice migration measures should be considered:

- Site compounds will be located in excess of 30m from noise sensitive receptors within the site constraints. The use lifting bulky items, dropping and loading of materials within these areas should be restricted to normal working hours.
- For mobile plant items such as dump trucks, excavators and loaders, the installation of an acoustic exhaust and or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB. Mobile plant should be switched off when not in use and not left idling.
- For concrete mixers, control measures should be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum.
- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation.
- Demountable enclosures can also be used to screen operatives using hand tools and will be moved around site as necessary.
- All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

8.1.1.1 Screening

Screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. Construction site hoarding will be constructed around the site boundaries as standard. The hoarding will be constructed of a material with a mass per unit of surface area greater than 7 kg/m² to provide adequate sound attenuation.

In addition, careful planning of the site layout will also be considered. The placement of site buildings such as offices and stores will be used, where feasible, to provide noise screening when placed between the source and the receiver.

With respect pipe installation works, Annex B of *BS 5228-1:2009+A1:2014* (Figures B1, B2 and B3) provide typical details for temporary and mobile acoustic screens, sheds and enclosures that can be constructed on site from standard materials.

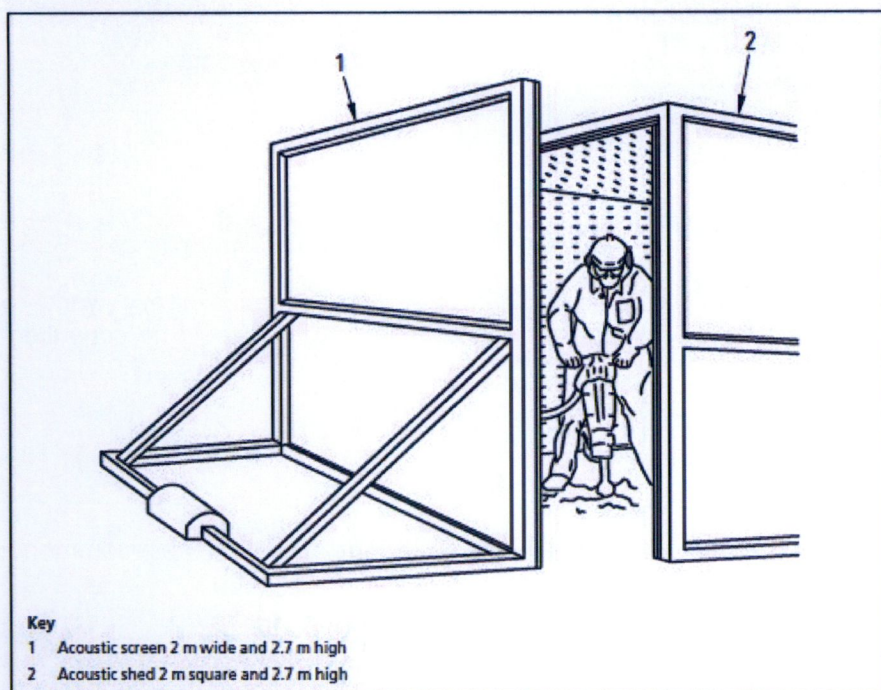


Table B.4 Measured sound reduction given by types of partial enclosure

Type of enclosure (see Figure B.3)	Reduction dB(A)		
	Facing the opening(s)	Sideways	Facing rear of shed
Open-sided shed lined with absorbent material; no screen	1	9	14
Open-sided shed lined with absorbent material; with reflecting screen in front	10	6	8
Open-sided shed lined with absorbent material; with absorbent screen in front	10	10	10

8.1.1.2 Liaison with the Public

A designated environmental liaison officer will be appointed to site during construction works. Any noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or where noisy works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

8.1.1.3 Project Programme

The phasing programme will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. During periods when high noise generating works such as demolition are in progress at the same time as other works of construction that themselves may generate significant noise and vibration, the working programme will be phased so as to prevent unacceptable disturbance at any time.

8.1.1.4 Vibration

The vibration from construction activities will be limited to the values set out in Section 8.2. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Limit values have been provided for soundly constructed residential and commercial properties and will be adhered to as follows:

Table 2.2: Recommended Vibration Criteria During Construction Phase

Building Category	Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:		
	Less than 15Hz	15 to 40Hz	40Hz and above
Structurally sound and non-protected buildings	12 mm/s	20 mm/s	50 mm/s
Protected and /or potentially vulnerable buildings	6 mm/s	10 mm/s	25 mm/s

Limits have been recommended above for protected structures. Where vibration-heavy works are proposed near protected structures the relevant engineer or conservation expert should be consulted in advance of works adjacent.

2.10.2 Operational Phase – Noise

2.10.2.1 Mechanical Services Plant

Plant items will be designed and selected so that cumulative noise emissions are within the recommended noise criteria. Therefore no mitigation is required.

2.10.2.2 Additional Traffic on Surrounding Roads

During the operational phase of the development the change in noise level associated with development traffic is predicted to be negligible and therefore, noise mitigation measures with respect to the outward impact of traffic from the development are not deemed necessary.

2.10.2.3 Internal Underground Waste Water Pumping Station

The development will include a waste water pumping station located at the northern site boundary. To ensure that this item of site infrastructure does not have an adverse noise impact on the receiving environment, noise generated by its operation shall be non-tonal, non-impulsive and be no greater than 60 dB(A) when measured at a reference distance of 1m. The commissioning phase of the station will include the measurement of operational noise levels by an experienced acoustic consultant to verify that the operational noise achieves its acoustic performance design criteria in respect of the closest residential receptors at St. Finian's Way.

2.10.3 Monitoring

2.10.3.1 Construction Phase

Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise*.

Vibration monitoring should be conducted in accordance with BS 6472:2008 Guide to evaluation of human exposure to vibration in buildings - Vibration sources other than blasting (human disturbance) and BS ISO 4866:2010 Mechanical vibration and shock - Vibration of fixed structures - Guidelines for the measurement of vibrations and evaluation of their effects on structures (building damage).

2.10.3.2 Operational Phase

Noise monitoring of equipment in operation will be carried out by a qualified acoustician at the pumping station to ensure operational noise levels are in compliance with criteria set out in Section 8.5.2.1.

2.11 LANDSCAPE AND VISUAL

The following recommendations are put forward to mitigate the negative impacts mentioned above and to reinforce the positive impacts of the proposed development. Mitigation measures are proposed and considered only on the lands of the subject site.

2.11.1 Construction Phase

During the construction phase, site hoarding will be erected to restrict views of the site during construction. Hours of construction activity will be as set out in the Construction and Environmental Management Plan (prepared by DBFL) and as set out in Chapter 2 of the EIAR.

2.11.2 Operational Phase

A comprehensive landscape architectural design for the entire site is proposed, integrating mitigation measures that are required to avoid or reduce potential negative effects of the development. Please see the landscape plans and reports by Murray & Associates, Landscape Architecture as submitted with the planning application for full details of the extensive landscape proposals. The primary measures of note are as follows:

- Retention of existing hedgerows associated with the historic landscape and burgage plot pattern.
- Extensive tree planting to screen and soften the proposed development, create structure in the streetscapes, impart character to the proposed development and
- Extensive native shrub and hedgerow planting, as well as wildflower and perennial plantations to encourage pollinators and native wildlife. Planting is in accordance with the All-Ireland Pollinator Plan.
- Three new public parks with recreational space, habitat plantation and integrated Sustainable Drainage measures.
- Extensive areas of greenway and streetscape for walking and cycling.

The existing boundary hedges around the site to the east and north are to be retained. In areas where these existing boundaries need rehabilitation and filling in, semi-mature native tree planting, bare-root tree planting and native shrub planting is proposed as part of the planning application. This will create a landscape buffer space that will reduce the views into the site from adjacent properties to the east and south-east. The south-eastern edge of the site contains an open space that will have semi-mature tree planting, contributing to screening the development from properties to the south and south-east. Native trees, shrubs and wildflowers will be used where possible, particularly in the buffer spaces surrounding the development site.

Internal streets within the development will also contain a substantial amount street tree planting that will continue to soften and screen the development over the medium to long-term as the trees and planting mature.

Mitigation measures are shown on the submitted landscape drawings. At time of planting, the proposed standard trees in the landscaped buffer zones will be at least 3.0m in height. The trees will reach a mature height of at least 7 to 15 metres, dependent on species within the medium term.

2.11.3 Monitoring

2.11.3.1 Construction Phase

Landscape tender drawings and specifications will be produced to ensure that the landscape work is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect.

The planting works will be undertaken in the planting season after completion of the main civil engineering and building work.

2.11.3.2 Operational Phase

This will consist of weed control, replacement planting, pruning etc. All landscape works will be in an establishment phase for the initial three years from planting. A landscape management plan accompanies the planning application.

2.11.3.3 Summary of Mitigation & Monitoring

The Table below summarises the Construction Phase mitigation and monitoring measures.

Table 2.3: Construction: Mitigation & Monitoring Measures

Likely Significant Effect	Mitigation	Monitoring
Visual: - Construction Traffic/Cranes	Site Hoarding	Regular site visits as per the Inspection Plan
Landscape: Site Clearance, Change from agricultural landscape to residential	Mitigation measures for landscape only applicable in operational phase	Inspection of tree and hedge protection measures to southern boundary

The Table below summarises the Operational Phase mitigation and monitoring measures.

Table 2.4: Operation: Mitigation & Monitoring Measures

Likely Significant Effect	Mitigation	Monitoring
Visual: Negative effect on adjacent visual receptors	Proposed tree planting will mature over time, contributing to the visual softening of the development.	Initial Defects period applicable as per regular planning grant. Landscape Management plan detailing maintenance of trees etc included as part of planning application.
Landscape: Change in landscape character	Retention of existing boundary hedgerows. Proposed planting within development of new native standard trees, native woodland, native wildflower meadow.	Regular maintenance regime by experienced landscape contractor

2.12 MATERIAL ASSETS – TRAFFIC AND TRANSPORTATION

2.12.1 Construction phase

A Construction and Environmental Management Plan (CEMP) accompanies this application (contained in Appendix D, Volume III of the EIAR) and sets out the measures to mitigate the impact on the local environment during the construction phase. The Construction Traffic Management Plan (CTMP) contained in the CEMP will be developed by the appointed contractor and submitted to South Dublin County Council for approval prior to commencement of work. It will implement the relevant Mitigation Measures in this EIAR including the CEMP and associated CTMP accompanying this planning application (contained in Appendix D2 Volume III of this EIAR).

In general, the impact of the construction period will be short-term in nature and less significant than the operational stage of the proposed development due to the reduced traffic volumes generated during the construction stage compared to the operational stage. In addition, the peak construction arrivals / departures will be outside of the road network peak hours and therefore will not exacerbate any existing delays encountered during peak times. It is anticipated that the generation of HGV's during the construction

period will be evenly spread throughout the day, and such will not impact significantly during the peak traffic period.

The main construction access will be via the existing construction access located on Athgoe Road which currently facilitates access to construction vehicles at the adjacent Graydon residential development currently under construction as introduced in Section 10.6.1.

Construction traffic will continue to enter the site via the Athgoe Road for the construction phase of the development with construction traffic diverted to internal, temporary haul routes to access construction areas.

All construction related parking will be provided on site. Construction traffic will consist of the following categories:

- Private vehicles owned and driven by site construction staff and by full time supervisory staff. As introduced in Section 10.6.1, there is predicted to be 40 no. staff car trips daily. The proposed on-site car parking area will be designed to have the capacity to accommodate this parking demand in addition to an element of visitor parking spaces.
- Excavation plant and dumper trucks involved in site development works and material delivery vehicles for the following: granular fill materials, concrete pipes, manholes, reinforcement steel, ready mix concrete and mortar, concrete blocks, miscellaneous building materials, etc.

It is anticipated that the generation of HGV's during the construction period will be evenly spread throughout the day and as such will not impact significantly during the peak traffic periods.

On-site employees will generally arrive before 08:00, thus avoiding morning peak hour traffic. These employees will generally depart after 18:00 and avoid the PM peak hour.

To minimise disruption to the surrounding environment, the following mitigation measures will be implemented:

- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and roads.
- All road works will be adequately signposted and enclosed to ensure the safety of all road users and construction personnel.
- A dedicated 'construction' site access / egress junction will be provided during all construction phases. This will be via the existing accesses constructed on Athgoe Road as introduced in Section 10.6.1.
- Provision of sufficient on-site parking for staff and visitors (as described above) and compounding through the construction of temporary hardstanding areas to ensure no potential overflow of construction generated traffic onto the local network.
- A material storage zone will also be provided in the compound area. This storage zone will include material recycling areas and facilities.
- A series of 'way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas.
- A dedicated construction haul route has been identified and will be agreed with the local authority prior to the commencement of constructions activities on-site.
- Truck wheel washes will be installed at construction and discharge from wheel wash area will be directed to on-site settlement ponds.
- On completion of the works all construction materials, debris, temporary hardstands etc. from the site compound will be removed off site and the site compound area reinstated in full on completion of the works.
- Measures will be put in place to minimise the risk of road traffic accidents during the construction phase including;

- appropriate temporary traffic management as required,
- strict adherence to the proposed construction vehicle haul route, and
- Wayfinding signage so all visitors can navigate to the designated visitor parking and sign in areas.

2.12.2 Operational phase

A package of integrated mitigation measures has been identified and will be implemented to off-set the additional local demand that the proposed development on the subject zoned lands could potentially generate as a result of the forecast increase in vehicle movements by residents of the scheme. The identified measures are summarised below:

- Management – A preliminary Mobility Management Plan (MMP) is included with the application as part of the Traffic & Transport Assessment Report. The MMP ultimately seeks to encourage sustainable travel practices for all journeys by residents and visitors traveling to and from the proposed development. It involves the incorporation of a wide range of possible “hard” and “soft” tools from which to choose from with the objective of influencing travel choices. The measures in the MMP comprise an number of different categories including;
 - Management & Monitoring
 - Walking Strategy
 - Cycling Strategy
 - Public Transport Strategy
 - Private Car Strategy
 - Marketing & Promotion Strategy.
- Infrastructure (Through Road) – The delivery of a through route between the eastern access point at Burgage Crescent and the western access location on Athgoe Road will provide an alternative routing option between origins / destinations to the east / west negating the need to travel via Newcastle Town Centre. This will help improve the operational performance of junctions along Main Street and create a more pedestrian / cyclist friendly environment in the Town Centre.
- Infrastructure (Permeability) – The subject development will be highly accessible to both pedestrians and cyclists via a range of convenient connection points and internal linkages. New dedicated pedestrian / bicycle facilities have been provided as part of the aforementioned new road infrastructure through the site. Pedestrians and cyclists will also be well provided for through the provision of dedicated (i.e., non-vehicular) connections onto Newcastle Main Street. Furthermore, the design of the proposed development has sought to provide for the opportunity for pedestrian / cycle connection to be provided in the future to adjoining third party lands. The provision of these internal linkages safeguards the ability for the local authority to deliver in the future a viable, convenient and permeable network of cycle / pedestrian links thereby increasing the attractiveness of these modes of travel for all local trips. Furthermore, the proposals also provide for the provision of a total of 94 no. bicycle parking spaces on-site comprising 30 no. short stay spaces and 64 no. long stay spaces. This level of cycle parking provision is 58 no. spaces higher than the current development plan requirement.
- Service (Car Sharing) – 2 no. Car Share spaces are proposed within the development site boundary . GoCar members can book cars online or via the app for as little as an hour, then unlock with their phone or GoCar; the keys are in the car, with fuel, insurance and city parking all included. The benefits of such car sharing services include, (i) the reduction of the number of cars on the road and therefore traffic congestion, noise and air pollution; (ii) frees up land traditionally used for private parking spaces but which may not be used, (iii) increases use of public transport, walking and cycling as the need for car ownership is reduced and (iv) Car sharing allows those who cannot afford a car the opportunity to drive, encouraging social inclusivity.

2.12.3 Monitoring

The mobility management plan of the development will be monitored and updated every two years over a period of 10 years from the initial occupancy of the units. This will allow the progress made towards achieving mode split targets to be tracked and updated as necessary. These modal split targets include the reduction in vehicular trips by 15% with reassignment onto more sustainable modes of travel as outlined earlier in this Chapter. The information obtained from the monitoring surveys will be used to identify ways in which the MMP initiatives should be taken forward in order to maintain and further encourage sustainable travel characteristics. A specific aim of the MMP is to reduce the number of trips by private car. Accordingly, an objective of the MMP is to reduce travel by private car by 15% compared to the Opening Year mode share. The 15% reduction in car travel amongst residents shall reassign to more sustainable modes of travel including walking, cycling and public transport through the successful implementation of the mobility management plan measures.

2.13 MATERIAL ASSETS – WASTE MANAGEMENT

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

2.13.1 Construction Phase Waste Management Plan

The following mitigation measures will be implemented during the construction phase of the Proposed Development:

As previously stated, a project specific RWMP has been prepared in line with the requirements of the requirements of the Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction and Demolition Projects (EPA, 2021), and is included as Appendix 11.1. The mitigation measures outlined in the RWMP will be implemented in full and form part of mitigation strategy for the site. The mitigation measures presented in this RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the Proposed Development.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (Appendix E 11.1 Volume III of this EIAR) in agreement with SDCC and in compliance with any planning conditions, or submit an addendum to the RWMP to SDCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will implement the RWMP throughout the duration of the proposed construction phase.

A quantity of topsoil and sub soil will need to be excavated to facilitate the Proposed Development. The Project Engineers have estimated that 37,200m³ of excavated material will need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
- Concrete rubble (including ceramics, tiles and bricks);
 - Plasterboard;
 - Metals;

- Glass; and
- Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A Resource Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.
- Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Article 27 of the EC (Waste Directive) Regulations (2011). EPA approval will be obtained prior to moving material as a by-product.

These mitigation measures will ensure that the waste arising from the construction phase of the Proposed Development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, the EMR Waste Management Plan 2015 – 2021 and the draft NWMPCE. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

2.13.2 Operational Phase Waste Management Plan

As previously stated, a project specific OWMP has been prepared and is included as Appendix E 11.2 Volume III of this EIAR. The mitigation measures outlined in the OWMP will be implemented in full and form part of mitigation strategy for the site. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the EMR Waste Management Plan 2015 – 2021, Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland and the SDCC waste byelaws.

- The residents / crèche staff / facilities management company for the site during the operational phase will be responsible for ensuring
 - allocating personnel and resources, as needed;
 - the ongoing implementation of this OWMP; and
 - ensuring a high level of recycling, reuse and recovery at the site of the Proposed Development.

The following mitigation measures will be implemented:

- The residents / crèche staff / facilities management company will ensure on-site segregation of all waste materials into appropriate categories, including (but not limited to):
 - Organic waste;
 - Dry Mixed Recyclables;
 - Mixed Non-Recyclable Waste;
 - Cardboard (for bailing);
 - Plastic (for bailing);
 - Glass;
 - Waste Oil;

- Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment;
- Batteries (non-hazardous and hazardous);
- Light bulbs; and
- Cleaning and Farming chemicals (pesticides, paints, adhesives, resins, detergents, etc.).

The residents / crèche staff / facilities management company for the site will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;

The residents / crèche staff / facilities management company will ensure that all waste collected from the site of the Proposed Development will be reused, recycled or recovered, where possible, with the exception of those waste streams where appropriate facilities are currently not available; and

The residents / crèche staff / facilities management company will ensure that all waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the Proposed Development during the operational phase is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997, the EMR Waste Management Plan 2015 – 2021 and the SDCC Waste Management By-Laws 2020. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

2.13.3 Monitoring

The management of waste during the construction phase will be monitored by the contractor's appointed Resource Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation.

The management of waste during the operational phase will be monitored by the residents / facilities management company to ensure effective implementation of the OWMP internally and by the nominated waste contractor(s).

2.13.3.1 Construction Phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the excavation and construction works, where there is a potential for waste management objectives to become secondary to other objectives, i.e., progress and meeting construction schedule targets. The RWMP specifies the need for a Resource Manager to be appointed, who will have responsibility for monitoring the actual waste volumes being generated and ensuring that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the Resource Manager will identify the reasons for this and work to resolve any issues. Recording of waste generation during the construction phase of the Proposed Development will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future developments.

2.13.3.2 Operational Phase

During the operational phase, waste generation volumes will be monitored by the facilities management company against the predicted waste volumes outlined in the OWMP. There may be opportunities to reduce the number of bins and equipment required in the WSAs, where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contractor costs.

Table 2.5: Monitoring Proposals

Likely Significant Effect	Monitoring Proposals
Litter Pollution	The Contractor will review and maintain waste records and site audits
Unlicensed Waste Collection (Illegal Dumping)	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Insufficient Waste Facilities	A register will be maintained and reviewed. A copy of all waste collection permits will be maintained.
Lack of waste Classification	An appointed Resource Manager will monitor all on-site waste segregation and classification
Unlicensed Waste Collection (Illegal Dumping)	The Residents / Commercial Tenants / Facilities Manager will maintain waste receipts on-site for a period of 7 years and make available to SDCC as requested.
Poor Waste Segregation	Waste generation volumes will be monitored by the Residents / Commercial Tenants / Facilities Manager
Litter Pollution	Waste storage areas will be monitored by the Residents / Commercial Tenants / Facilities Manager

2.14 MATERIAL ASSETS – UTILITIES

2.14.1 Construction Mitigation

Mitigation measures proposed in relation to the drainage and water infrastructure include the following:

2.14.1.1 Stormwater Infrastructure

A detailed “Construction and Environmental Management Plan” (CEMP) will be developed and implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the “Construction and Environmental Management Plan”. The mitigation measures contained in the EIAR will be included in the contractors CEMP.

Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement tanks where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.

In the event of groundwater being encountered during the construction phase, mitigation measures will include dewatering by pumping to an appropriate settlement pond/tank prior to discharge. Other measures would include excluding contaminating materials such as fuels and hydrocarbons from sensitive parts of the site i.e. highly vulnerable groundwater areas.

2.14.1.2 Foul Infrastructure

In order to reduce the risk of defective or leaking sewers, all new sewers will be laid in accordance with Irish Water standards, pressure tested, and CCTV surveyed to ascertain any possible defects.

The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be removed off site to a licensed facility until a connection to the public foul drainage network has been established.

2.14.1.3 Potable Water Infrastructure

The construction compound's potable water supply shall be protected from contamination by any construction activities or materials by constructing it to Irish Water standards with appropriate cover.

Please also refer to Chapter 6.0 – Water for mitigation measures.

Power, Gas & Telecommunications

The relocation or diversions of the existing overhead ESB lines may lead to loss of connectivity to and / or interruption of the supply from the electrical grid to the surrounding areas. Any loss of supply will be managed by ESB Networks to minimise impact on neighbouring properties.

Any loss of supply will be managed by Eir / Virgin Media to minimise impact on neighbouring properties.

2.14.2 Operational Mitigation

Where possible backup network supply to any services will be provided should the need for relocation or diversion or existing services be required otherwise relocation or diversion works will be planned to incur minimal impact, with users notified in advance of any works.

Please refer to Chapter 6.0 Water for further operational mitigations.

2.14.3 Monitoring

Please refer to Chapter 6.0 – Water and Chapter 4.0 Biodiversity for the proposed monitoring in relation to the surface water during the construction phase. There is no specific monitoring is proposed in relation to the remaining material assets infrastructure during the construction phase.

Proposed monitoring during the operational phase in relation to the water infrastructure are as follows:

- All drainage works will be approved by South Dublin County Council, Sanitary Services Division, and will be carried out in accordance with the GDR COP (Greater Dublin Regional Code of Practice for Drainage Works).
- The surface water and foul drainage systems will be monitored by way of observation of any flooding events if such occur and the establishment of a proper maintenance programme for all sewers / Suds features etc.
- Regular cleaning of pipe networks within the development taken in charge will ensure no blockage will obstruct any flow from surface and foul networks.
- On-going water usage within the proposed development will be monitored by bulk water meters. Water usage will be monitored by the relevant authority to avoid waste and leaks etc.
- All drainage works will be approved by South Dublin County Council and will be carried out in accordance with the GDR COP (Greater Dublin Regional Code of Practice for Drainage Works).
- All foul and surface water sewers will be CCTV surveyed prior to being 'taken in charge' by South Dublin County Council.

2.15 CULTURAL HERITAGE – ARCHAEOLOGY

2.15.1 Construction Phase

2.15.1.1 Archaeology

Whilst it is acknowledged that the preservation in-situ of archaeological remains is considered the best practise with regards to conserving the archaeological resource, the required layout of the development (and the attenuation requirements located within greenfield areas) means that the archaeological features and deposits within AA1-4 will be subject to archaeological preservation by record (prior to the commencement of construction). This will be carried out under licence to the National Monuments Service of the DoHLGH. Full provision will be made available for the resolution of the archaeological remains, both on site and during the post-excavation process.

Chapter 8, Noise and Vibration, has predicted that the vibration levels during construction are not likely to be such that any damage would occur to built heritage structures, including the tower house. The Noise

and Vibration chapter has proposed mitigation through monitoring in accordance with the relevant standards to ensure that vibration levels do not exceed acceptable levels in the vicinity of built heritage structures.

All topsoil stripping will be subject to archaeological monitoring by a suitably qualified archaeologist. Should any archaeological remains be identified, consultation will be required with the National Monuments Service of the DoHLGH as to whether preservation by record or in-situ is carried out.

No mitigation is required along the existing haulage road or within the south-eastern section of the development area as these areas have already been subject to full archaeological excavation and preservation by record.

2.15.2 Operational Phase

2.15.2.1 Archaeology

A full landscape record of the tower house, which records its current condition and setting, adjacent to the proposed development, will be carried out prior to the commencement of construction and operation of the development.

2.15.3 Monitoring

The mitigation measures detailed above would also function as a monitoring system to allow the further assessment of the scale of the predicted impacts and the effectiveness of the mitigation measures.

13.1.1 Construction Phase

13.1.1.1 Archaeology

Whilst it is acknowledged that the preservation in-situ of archaeological remains is considered the best practise with regards to conserving the archaeological resource, the required layout of the development (and the attenuation requirements located within greenfield areas) means that the archaeological features and deposits within AA1-3 will be subject to archaeological preservation by record (prior to the commencement of construction). This will be carried out under licence to the National Monuments Service of the DoHLGH. Full provision will be made available for the resolution of the archaeological remains, both on site and during the post-excavation process.

Chapter 8, Noise and Vibration, has predicted that the vibration levels during construction are not likely to be such that any damage would occur to built heritage structures, including the tower house. The Noise and Vibration chapter has proposed mitigation through monitoring in accordance with the relevant standards to ensure that vibration levels do not exceed acceptable levels in the vicinity of built heritage structures.

All topsoil stripping will be subject to archaeological monitoring by a suitably qualified archaeologist. Should any archaeological remains be identified, consultation will be required with the National Monuments Service of the DoHLGH as to whether preservation by record or in-situ is carried out.

The excavation of the pipeline trench through DU020-003008 will be subject to archaeological monitoring by a suitably qualified archaeologist. Should any archaeological remains be identified, consultation will be required with the National Monuments Service of the DoHLGH as to whether preservation by record or in-situ is carried out.

No mitigation is required along the existing haulage road or within the central section of the development area as these areas have already been subject to full archaeological excavation and preservation by record.

13.1.1.2 Cultural Heritage

No mitigation is deemed necessary.

13.1.2 Operational Phase

13.1.2.1 Archaeology

A full landscape record of the tower house, which records its current condition and setting, adjacent to the proposed development, will be carried out prior to the commencement of construction and operation of the development.

13.1.2.2 Cultural Heritage

No mitigation is required.

13.2 Monitoring

The mitigation measures detailed above would also function as a monitoring system to allow the further assessment of the scale of the predicted impacts and the effectiveness of the mitigation measures.

2.16 CULTURAL HERITAGE – ARCHITECTURAL HERITAGE

2.16.1 Construction Phase

2.16.2 Construction Phase

To mitigate the potential direct effect on the tower house at BH-03 the means of excavation of the land within the site in the vicinity of the tower house should be designed so as to minimise any vibration at the tower that would be likely to cause damage to the building. Chapter 8, Noise and Vibration has predicted that the vibration levels during construction are not likely to be such that any damage would occur to built heritage structures, notwithstanding the adoption of lower limits of vibration for the tower house and the protected structures. The Noise and Vibration chapter has proposed mitigation through monitoring in accordance with the relevant standards to ensure that vibration levels do not exceed acceptable levels in the vicinity of built heritage structures.

No mitigation is possible to reduce the indirect effect on the settings of Newcastle Farm, BH-02, or the tower house, BH-03, during construction phase.

2.16.3 Operational Phase

No mitigation is required to reduce the indirect effect on the setting of Newcastle Farm at operational phase other than good quality design of the boundary to Athgoe Road.

No mitigation is possible to reduce the indirect effects of the proposed development on the setting of the tower house at BH-03 other than the designed layout of the proposed development to keep houses back from the area immediately to the front of the tower house. This has included a restriction in height of the proposed houses nearest to the tower house to two storeys in addition to setting the houses back from the street and from the vicinity of the tower house.

2.16.4 Monitoring

2.16.5 Construction and Operational Phase

During the construction phase it will be necessary to monitor vibration levels at the tower house, BH-02, to ensure that no damage occurs to the tower house through vibration effects. Chapter 8, Noise and Vibration, sets down the criteria for monitoring during construction.

2.17 RISK MANAGEMENT FOR MAJOR ACCIDENTS

The Construction and Environmental Management Plan (CEMP - contained in Appendix D Volume III of the EIAR) and the Health and Safety Plan (which will be developed and included in the final CEMP) will limit the risk of accidents during construction. Fire safety will be dealt with under the Fire Safety Code at design and construction stage. The estate management company will have responsibility for fire safety during operations. The CEMP along with the mitigation measures contained in this EIAR will be implemented as part of the construction of the project.

The proposed development will involve ground works to facilitate the proposed development. Site investigations have been carried out (refer to Appendix D1. Volume III of this EIAR) and have not identified any hazardous material with the exception of TP54 at 1.00mBGL where the results indicate that the total organic carbon is above the inert limits (3.86% vs 3%*l*). Note TP 54 is within the subject site to the northwest of the site. All spoil disposed of off-site will be sent to a suitably licensed facility. Further site investigation and WAC (Waste Acceptance Criteria) testing will be carried out prior to construction to inform the detailed design. In the event that any hazardous material is identified the appropriate measures will be taken in accordance with the requirements of the EPA. The excavation and movement of soil from the site will be undertaken by a registered specialist contractor and removed to a licensed facility. The following are outlined:

- Hazardous materials used during construction will be appropriately stored so as not to give rise to a risk of pollution.
- In the event of storms or snow, construction activity can be halted, and the site secured. The construction activity will involve a number of potential risks, as set out below. The risks identified include traffic management, and fire strategy.
- During the construction stage, the risk of accidents associated with the proposed development are not predicted to cause unusual, significant or adverse effects to the existing public road network. The vast majority of the works are away from the public road in a controlled environment. The objective of which is to minimise the short-term disruption to local residents and reduce the potential for accidents.
- Furthermore, is expected that the risk of accidents would be low during the construction of the proposed development considering the standard construction practices which are to be used.
- With reference to natural disasters (e.g., flooding), the proposed development has undergone a Site-Specific Flood Risk Assessment, prepared by DBFL Consulting Engineers. The main area of the site where development is proposed is low risk of fluvial, pluvial or groundwater flooding.
- A Health and Safety Plan will be prepared (required by the *Safety, Health and Welfare at Work (Construction) Regulations 2013*) to address health and safety issues from the design stages through to the completion of the construction and maintenance phases. The Health and Safety Plan will comply with the requirements of the Regulations and will be reviewed as the development progresses.
- Safety on site will be of paramount importance. Only contractors with the highest safety standards and training will be selected. During the selection of the relevant contractor and the respective subcontractors their safety records will be investigated.
- Prior to working on site, each individual will receive a full safety briefing and will be provided with all of the safety equipment relevant to the tasks the individual will be required to perform during employment on site.
- Safety briefings will be held regularly and prior to any onerous or special task. 'Toolbox talks' will be held to ensure all workers are fully aware of the tasks to be undertaken and the parameters required to ensure the task will be successfully and safely completed.
- All visitors will be required to wear appropriate personal protective equipment prior to going on to the site and will undergo a safety briefing by a member of the site safety team.

- Regular site safety audits will be carried out throughout the construction programme to ensure that the rules and regulations established for the site are complied with at all times.

Table 2.6: Strategy for tackling potential risks.

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION
Risk Number	Risk Description / Risk Event Statement	Responsible	Impact H / M / L	Probability H / M / L	Actions
Provide a unique identifier for risk	A risk event statement states (i) what might happen in the future and (ii) its possible impact on the project.	Name or title of team member responsible for risk	Enter H (High); M (Medium); or L (Low) according to impact definitions	Enter H (High), M (Medium) or L (Low) according to probability definitions	List, by date, all actions taken to respond to the risk. This does not include assessing the risk
1	Work which puts persons at risk of:-burial under earth falls. Risk of burial under earthfalls in trenches.	Project Supervisor Construction Stage (PSCS)	H	M	Contractor to address requirement for trench support. Excavations are to be carried out at safe slope. Refer to site investigation for same and temporary works engineer to design.
2	Scaffolding Risk of falling from scaffolding, ladders or unprotected edges/open voids during the construction phase.	PSCS	H	M	Working at height required throughout the project. Installation of scaffolding for all working at height activities to be subject to a full temporary works design submission. In order to fully Co-Ordinate any temporary works submission the Project Supervisor for the Design Process must receive the following items before reviewing any submission; A full design submission, Calculations for the design, Design Risk Assessment, Copy of designer's PI insurances, Designers CV. This submission can then be reviewed by the Permanent Works Engineer to ensure the design will not impact on the permanent structure.
3	Fire Strategy Risk of fire damage to houses or to partially complete new apartment blocks from construction activities.	PSCS/ PSDP / Fire SC.	H	M	Fire strategy must be put in place in advance of start on site which must take into consideration the requirement for hot works and the provision of Hot Works Permit systems to manage Hot works when needed. A fire marshal will be required - full co-operation from site supervisors and contractors will be required.

1. BASIC RISK INFORMATION			2. RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION
4	<p>Lifting Operations</p> <p>Work involving the assembly or dismantling of heavy pre-fabricated components.</p> <p>Risk of injury during the assembly of precast columns, stairs, façade panels, etc.</p>	PSCS/PSDP	H	M	<p>Lifting operations using cranes will be a requirement during the project. The PSDP must identify this as a risk factor ensuring the ground conditions are tested and appropriate to point loading from mobile cranes. The PSCS must ensure there is a fully risk assessed lift plan to manage all lifting operations on site.</p>
5	<p>Existing Utilities</p> <p>Work near overhead electric cables, risk of Electrocutation</p>	PSCS/PSDP	H	M	<p>The PSDP must highlight the existence of live overhead ESB cables on site. The sequence of work to be planned to avoid working in close proximity to the lines. The PSCS to arrange for the relocation of the lines prior to working around them. The PSCS must follow the ESB code of practice and provide a risk assessed RAMS document to manage this hazard.</p>
6.	<p>Construction Traffic</p> <p>Working adjacent to live construction and normal traffic.</p>	PSCS/PSDP	H	M	<p>Contractor to prepare and implement a Construction Traffic Management Plan to be agreed with the design team to ensure public safety. The contractor is to supervise vehicle movements during construction and enforce the traffic management plan.</p>

