

Chapter 15:

Summary of EIAR Mitigation and Monitoring Measures

15.0 SUMMARY OF EIAR MITIGATION & MONITORING MEASURES

15.1 INTRODUCTION

The central purpose of EIA is to identify potentially significant adverse impacts at the pre-consent stage and to propose measures to mitigate or ameliorate such impacts. This chapter of the EIAR document has been prepared by **John Spain Associates** and sets out a summary, for ease of reference, of the range of methods described within the individual chapters of this EIAR document which are proposed as mitigation and for monitoring during the construction and operational phases of the proposed development. It is intended that this chapter of the EIAR document will provide a useful and convenient summary to the competent/consent authority of the range of mitigation and monitoring measures proposed.

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

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

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

The 2018 EIA Guidelines published by the Department of Housing, Planning and Local Government state:

“While not a mandatory requirement an EIAR can very usefully include a summary table of features and/or measures envisaged to avoid, prevent or reduce and, if possible, offset likely significant adverse effects of the proposed development, and a timescale for the implementation of proposed mitigation measures.”

Given the complexity of the scheme in question, and the detail provided within this EIAR, this chapter seeks to provide a complete overview of mitigation and monitoring measures proposed, in the spirit of the above statement within the EIA Guidelines albeit not formatted as a table.

15.2 MITIGATION STRATEGIES

15.2.1 Introduction

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

15.2.2 Mitigation by Avoidance

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

15.2.3 Mitigation by Reduction

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

15.2.4 Reducing the Effect

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

15.2.5 Reducing Exposure to the Impact

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

15.2.6 Mitigation by Remedy

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

15.3 MITIGATION AND MONITORING MEASURES

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

15.3.1 Project Description & Alternatives Examined

Construction Phase

PD&AE CONST 1: The Construction and Environmental Management Plan will be implemented during construction of the development. It will remain a live document and may be updated as required. This Plan will reduce the impacts of the construction phase on local residents and ensure the local road network is not adversely affected during the course of the construction project, while methods such as those outlined in the pollution control section shall be implemented to mitigate any potential pollution events.

PD&AE CONST 2: A Construction Waste Management Plan and Operational Waste Management Plan have been prepared in respect of the proposed development by AWN and these will be implemented throughout construction and operation of the development. These Waste Management Plans meet the requirements of the Best Practice Guidelines for the Preparation of Waste Management Plans for Construction Projects.

Operational Phase

Not applicable.

Monitoring

Not applicable.

13.3.2 Population and Human Health

Construction Phase

Not applicable.

Operational Phase

Not applicable.

Monitoring

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

15.3.3 Archaeology and Cultural Heritage

Construction Phase

ARCH&CH CONST 1:

Following clearance of all demolition debris and overgrowth and in advance of any construction or excavation, a strategic programme of testing will be implemented, in consultation with the NMS, to all investigate the previously untested areas. This assessment will be carried out under an extension to the Ministerial Consent C207 and Registration E003332 granted for the 2007 investigation.

Archaeological Test Trenching can be defined as 'a limited programme of intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land, inter-tidal zone or underwater. If such archaeological remains are present field evaluation defines their character, extent, quality and preservation, and enables an assessment of their worth in a local, regional, national or international context as appropriate' (CIfA 2014a).

Further mitigation such as preservation by record (excavation) / in-situ and/ or monitoring of groundworks may be required dependant on the results of the above investigation.

Archaeological Excavation, or preservation by record, can be defined as 'a programme of controlled, intrusive fieldwork with defined research objectives which examines, records and interprets archaeological deposits, features and structures and, as appropriate, retrieves artefacts, ecofacts and other remains within a specified area or site on land, inter-tidal zone or underwater. The records made and objects gathered during fieldwork are studied and the results of that study published in detail appropriate to the project design' (CIfA 2014b).

Archaeological Monitoring can be defined as ‘a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons, such as topsoil stripping during construction. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the identification of archaeology, the preparation of a report and an ordered archive (ClfA 2014c).

Operational Phase

Not applicable.

Monitoring

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

15.3.4 Biodiversity

Construction Phase

BIO CONST 1: Any vegetation (including trees, hedgerows or treelines, or areas of woodland adjacent to, or within, the proposed development boundary) which is to be retained shall be afforded adequate protection during the construction phase in accordance with the Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (National Roads Authority, 2006b), as follows:

- All trees along the proposed development boundary that are to be retained, both within and adjacent to the proposed development boundary (where the root protection area of the tree extends into the proposed development boundary), will be fenced off at the outset of works and for the duration of construction to avoid structural damage to the trunk, branches or root systems of the trees. Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree. The RPA will be defined based upon the recommendation of a qualified arborist.
- Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it.
- The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials (e.g. hydrocarbons) or concrete washout areas will not be undertaken within 10m of any retained trees, hedgerows and treelines.
- A qualified arborist shall assess the condition of, and advise on any repair works necessary to, any trees which are to be retained or that lie outside of the proposed development boundary but whose RPA is impacted by the works. Any remedial works required will be carried out by a qualified arborist.
- A buffer zone of at least 5m will be maintained between construction works and any retained hedgerows to ensure that the root protection areas are not damaged.

BIO CONST 2: The landscaping proposals, for this application, have been reviewed by a suitably qualified ecologist to ensure that no species listed on the Third Schedule of the *Birds and Natural Habitats Regulations* are included in the planting scheme.

The following recommendations have also been made with regards to the landscaping proposals:

- Seed mixes for proposed wildflower meadows/ wetland areas will be of Irish provenance. Seed mixes will be sourced from Design by Nature (<http://wildflowers.ie/>) or similar, to ensure that the mixes obtained are suitable for the environmental/ ground conditions and comprise species native to Ireland.

- Planting lists will include pollinator-friendly species and species which provide a foraging resource for local wildlife (e.g. fruiting trees which provide a foraging resource for birds etc.).
- The majority of proposed trees will be native species, with non-native specimen trees proposed at the podium level only to provide shape and character in this setting. Native trees, or varieties of such, proposed include *Alnus glutinosa*, *Sorbus aucuparia*, *Prunus padus/ Prunus avium*, *Betula pubescens*, *Pinus sylvestris* “frensham” and *Corylus avellana* “Red majestic”. Trees will be sourced from Irish nurseries to reduce the risk of imported diseases etc.

BIO CONST 3: To control dust emissions during construction works, standard mitigation measures shall be implemented, which include: spraying of exposed earthwork activities and site haul roads during dry and/or windy conditions; provision of wheel washes at exit points; control of vehicle speeds and speed restrictions (20 km/h on any un-surfaced site road); covering of haulage vehicles; and, sweeping of hard surface roads. These procedures will be strictly monitored and assessed on a daily basis.

Dust screens will be implemented at locations where there is the potential for air quality impacts on sensitive ecological receptors (i.e. within 100m of the works), such as the Golf Stream and Glenamuck North River, during the construction phase.

BIO CONST 4: The following general measures will be taken with regards the protection of surface water quality in the Golf Stream during the construction phase of the proposed development:

- Exclusion zones of between 5- 10m will be employed along the banks of the Golf Stream and construction vehicles will be excluded from this area. Exclusion zones will be defined by erecting a 1m high barrier along the watercourse formed by steel road pins supporting an orange PVC barrier with warning signs appropriately fixed at regular intervals.
- To prevent direct surface water runoff generated on site during construction from entering the Golf Stream, surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed development site is completed. A temporary drainage system will be installed prior to the commencement of the construction works, to collect surface water runoff during construction.
- All oils, fuels, paints and other chemicals will be stored in a secure bunded construction hardstand area. Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water features (e.g. Golf Stream) when not possible to carry out such activities off site.
- A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment.
- Concrete batching will take place off site. Wash down and wash out of concrete trucks will take place off site, at locations where there is no risk of run-off to receiving drainage features or watercourses, and any excess concrete will not be disposed of on site. Pumped concrete will be monitored to ensure there is no accidental discharge. Mixer washing will not be discharged into surface water drains.
- Discharge from any vehicle wheel wash areas will be directed to on-site settlement tanks/ponds. Debris and sediment captured by vehicle wheel washes will be disposed off-site at a licensed facility.
- Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established.
- Weather conditions and seasonal weather variation will be taken into account when planning stripping of topsoil and excavations, with an objective of minimising soil erosion and sediment runoff. These activities will not take place during heavy or prolonged periods of rainfall.

BIO CONST 5: The Inland Fisheries Ireland’s guidelines to achieve best practice will be implemented during the construction phase and the following mitigation measures will be implemented:

- Best site management practice for the control of silt and solids discharge into the watercourse.
- Excavation must be properly monitored; all topsoil is to be stored at a safe distance from the excavation.
- Earthworks to allow construction of abutments will be carried out to reduce existing ground levels to formation/foundation levels. Soil heap locations to be detailed in the appointed contractor's detailed construction management plan.
- Crane Setup for installation of main spans. Temporary access routes for craneage to be agreed prior to construction and be detailed in the contractor's detailed construction management plan. Construction of hard standing including foundations for crane outriggers need to be included.
- Prefabricated beams transportation. Delivery of precast elements to site. Storage area of prefabricated elements to be defined in contractor's construction management plan within reach of crane to minimise further disruption/construction traffic at river edge.
- Placement of prefabricated bridge beams. Crane position to be designed to minimise movements near river edge
- Demobilisation of crane.

BIO CONST 6: All bat species and their roost sites are strictly protected under both European and Irish legislation including:

- Wildlife Act 1976 and Wildlife (Amendment) Act, 2000 (S.I. No. 38 of 2000)
- Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna 1992 (Council Directive 92/43/EEC)
- European Communities (Birds and Natural Habitats) Regulations, 2011

It is an offence under Section 23 of the Wildlife Acts 1976-2017 and under Section 51 of the European Communities (Birds and Natural Habitats) Regulations, 2011 to kill a bat or to damage or destroy the breeding or resting place of any bat species. Under the European Communities (Birds and Natural Habitats) Regulations it is not necessary that the action should be deliberate for an offence to occur. A derogation may be granted by the Minister where there is no satisfactory alternative and the derogation is not detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range.

The following mitigation measures are proposed in relation to the felling of any mature trees on site. All mature trees on site were identified as being potentially suitable for roosting bats. Bats could occupy suitable roosting features at any time prior to the commencement of works. Therefore, there is an inherent risk that bats could be affected by the proposed felling works. The following mitigation procedures will be followed:

- In the unlikely event that roosting bats are found on the site during works, the works will immediately cease in that area and the local NPWS Conservation Ranger will be contacted. If bats are found to be roosting on the site, a derogation licence will be required from the NPWS and appropriate alternative roosting sites will be provided in the form of bat boxes. The bats will be removed by hand by a suitably qualified and licenced bat surveyor, under licence from the NPWS.
- Trees which have potential to support roosting bats, will be felled during the periods April-May or September – October, as during this period bats are capable of flight and may avoid the risks from tree felling if proper measures are undertaken, but are also neither breeding nor in hibernation.
- Trees with potential to support roosting bats will be felled in one of the following two methodologies, depending on the potential roost features identified, and an ecologist must be present during felling of these trees:
 - a. Trees will be section felled and the felled parts left in situ on the ground for a period of 24 hours. This should allow any bats present to escape or bats extracted by a licenced bat worker and placed in bat boxes to be erected on site.
 - b. Trees will be felled using heavy plant to push over the tree. In order to ensure the optimum warning for any roosting bats that may still be present, the tree will be pushed lightly two to three times, with a pause

of approximately 30 seconds between each nudge to allow bats to become active. The tree will then be pushed to the ground slowly and should remain in place until it is inspected by a bat specialist.

- c. The project ecologist will determine which of the above felling methodologies is most suitable for each tree with potential to support roosting bats. All other trees on site (i.e. those which are not identified as having potential to support roosting bats) can be felled in the usual manner.
- Where remedial works (e.g. pruning of limbs or removal of dense ivy) is to be undertaken to trees deemed to be suitable for bats (e.g. all mature trees on site), the affected sections of the tree will be checked by a bat specialist (using endoscope under a separate derogation licence held by that individual) for potential roost features before removal. For limbs containing potential roost features high in the tree canopy, this will necessitate the rigging and lowering of the limb to the ground (with the potential roost feature intact) for inspection by the bat specialist before it is cut up or mulched. If bats are found to be present, they will be removed by a bat specialist licenced to handle bats and released in the area in the evening following capture.

BIO CONST 7: Any external lighting to be installed, including facilitating night time working or security lighting, on the site will be sensitive to the presence of bats in the area. Lighting of the site during construction will be designed in accordance with the following guidance:

- *Guidance Notes for the Reduction of Obtrusive Light GN01* (Institute of Lighting Professionals, 2020)
- *Bats & Lighting - Guidance Notes for Planners, Engineers, Architects and Developers* (Bat Conservation Ireland, December 2010)
- *Bats and Lighting in the UK – Bats and the Built Environment Series* (Bat Conservation Trust UK, January 2008).

BIO CONST 8: As otter could potentially establish new holts in the future within the Zol of the proposed development, in particular along the Golf Stream, a pre-construction confirmatory survey of all suitable habitat along the banks of the Golf Stream will be required within 12 months of any construction works commencing. Any new otter holts present will be afforded protection in line with the requirements set out in the National Roads Authority's *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes* (2008).

BIO CONST 9: Whilst it is not envisaged that there will be any requirement for night-time working during construction, the following measure is proposed as a precautionary measure, to protect otter from artificial lighting during the construction phase of the proposed development:

- Night-time working, and installation of associated artificial lighting, will not be permitted within the vicinity of the Golf Stream on site;
- Flood lighting of the proposed development site, particularly in the vicinity of the Golf Stream, will not be permitted;
- Artificial lighting to accommodate night-time working in other areas of the site will be designed in a manner which is sensitive to the potential presence of nocturnal wildlife and will endeavour to maintain baseline light levels in sensitive areas.

BIO CONST 10: Mitigation measures outlined for the protection of depositing/lowland river habitat with the Golf Stream in Sections 5.8.2.1.5 and 5.8.2.1.6 will mitigate the effects of surface water pollutants on prey availability of otter and potential oil spills.

BIO CONST 11: The mitigation measures described below follow the recommendations set out in the *Guidelines for the Treatment of Badgers during the Construction of National Road Schemes* (National Roads Authority, 2006c). These guidelines set out the best practice approach in considering and mitigating impacts on badgers during construction works.

As badger could potentially establish new setts in the future within the ZoI of the proposed development, a pre-construction check of all suitable habitat within the proposed development boundary will be required within 12 months of any construction works commencing. Any new badger setts present will be afforded protection in line with the requirements set out in the TII/NRA guidance document as follows:

- Badger setts will be clearly marked and the extent of bounds prohibited for vehicles clearly marked by fencing and signage
- No heavy machinery shall be used within 30m of badger setts; lighter machinery (generally wheeled vehicles) shall not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance shall not take place within 10m of sett entrances
- During the breeding season (December to June inclusive), none of the above works shall be undertaken within 50m of active setts, nor blasting or pile driving within 150m of active setts
- Works can be undertaken within these zones following consultation with, the approval of and, if required, under the supervision of a badger ecologist

As the proposed development will not result in the loss of any badger setts, there is no requirement to construct any artificial setts as part of the mitigation strategy.

BIO CONST 12: Where feasible, vegetation (e.g. hedgerows, trees, scrub and grassland) will not be removed, between the 1st March and the 31st August, to avoid direct impacts on nesting birds. Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within 3 days of the nest survey, otherwise repeat surveys will be required.

Operational Phase

BIO OPER 1: The following relatively simple measures will be undertaken to enhance the biodiversity value of the proposed development:

- The use of herbicides in the maintenance of landscaping will be avoided, thus allowing a greater diversity of species to become established within existing habitats.
- Where practical, a low-intensity mowing regime will be adopted in areas of open space/ amenity, in order to enhance the habitats potential to support a range of pollinator species.

BIO OPER 2: In order to enhance the proposed development sites roosting potential for local bats, 6no. Schwegler 1FF bat boxes will be erected on suitable retained trees in suitable locations within the site. This will provide additional roosting opportunities for local bats, and recognises the degree of tree loss the proposed development requires. An ecologist will advise on the location and position of any bat boxes to be installed, paying consideration to the aspect and height etc. that the bat box will be located at.

BIO OPER 3: In order to enhance the availability of nesting habitat for local populations of breeding birds, 6no. bird boxes, of different designs, will be erected on suitable retained trees, in suitable locations.

Monitoring

The following monitoring is proposed for the proposed development site, post-construction:

Bird Boxes:

- Monitoring of use of the prescribed bird boxes will take place in summer, to check for nesting activity, for 3 years post-completion of the development, to determine if they need to be relocated within the site.

Bat Boxes

- Monitoring of use of proposed bat boxes will be undertaken annually for 5 years, by a suitably qualified and experienced bat ecologist, to check for roosting activity. Monitoring will take place twice a year- once in April/ May and once in September/ October. Results of the monitoring surveys will be provided to the competent authority.

15.3.5 Landscape and Visual Impact

Construction Phase

L&V CONST 1: The contractors' compounds, including site offices and parking, will be located in accordance with the construction and environmental management plan (CEMP). Impacts on residential and visual amenity will be minimised within the constraints of other operational requirements.

L&V CONST 2: Perimeter hoardings will be installed along the site boundaries and maintained in good condition and free of unsolicited graffiti and fly-posting.

L&V CONST 3: A construction materials and waste storage area will be located in accordance with the construction and environmental management plan (CEMP). Impacts on residential and visual amenity will be minimised within the constraints of other operational requirements.

L&V CONST 4: Visual impacts will increase and extend to a wider area with the installation of tower cranes across the site and the gradual emergence of the building structures. The tower cranes will be the tallest and most visible elements, but are temporary structures for the duration of construction only. These will be 'parked' in an orderly manner when not in use (e.g. without overhanging neighbouring residential areas) and removed from the site at the earliest opportunity.

L&V CONST 5: Plant generally within the site, especially during the early stages of construction, are likely to be partially visible from neighbouring streets and open spaces. When not in use, these will be parked in compound areas and/or away from the site perimeter in order to minimise visibility outside of working hours.

L&V CONST 6: A vehicle management strategy will be implemented, to minimise visual impacts and other impacts on neighbouring streets and residents, including the defined haul routes and times of operation; consolidation of vehicle movements for deliveries to site or removal of materials from site; and staggering of vehicle movements to minimise or avoid queuing on neighbouring streets.

Operational

L&V OPER 1: The previous SHD Application PL06D.302336 was refused by An Bord Pleanála for the following single reason (emphasis by author):

"Given the location of the site within the built-up area of Carrickmines, proximate to public transport linkages, to the M50 major transport corridor and to both established and emerging social, retail and employment facilities, it is considered that the proposed design strategy as it relates to height and design does not provide a landmark building which is considered necessary in order to achieve the optimal architectural solution for this strategic gateway site. Furthermore, and notwithstanding the acceptability of the proposed density, it is considered that the overall design of the scheme is monolithic and repetitive and represents an inappropriate design response to the site, given its locational context, which has the capacity to accommodate a building of much greater height and architectural significance than that proposed. Accordingly, the proposed development is considered to be contrary to national policy as set out in the National Planning Framework and section 28 Ministerial Guidance and is considered to be inconsistent with the proper planning and sustainable development of the area."

The proposed development has been designed after careful consideration of this reason for refusal and the proposed design has responded accordingly, breaking up the volume and mass of buildings with stepped elevations and roof heights, using elevation detailing to achieve a variety of character and emphasis, while using building position, height and a distinctive architectural design for Block B to deliver a landmark building at this strategic location.

The Urban Development and Building Height Guidelines sets out at para 3.2 a series of requirements for the satisfactory design and integration of taller buildings into the surrounding area. The proposed development has sought to address the following.

At the scale of the relevant city/town:

- Development proposals incorporating increased building height to provide a transition from neighbouring developed areas and to emphasise the landmark/gateway qualities of Block B0. This ensures the scale and character of development is appropriate at street level, especially adjoining Golf Lane and in proximity to Glenamuck Road. The northeast-southwest orientation of the taller buildings also helps to minimise intrusion upon long-distance views towards the Dublin mountains from north of the M50 motorway. However, there are no designated views that the development might interfere with.
- The proposed development aims to make a positive contribution to place-making by incorporating a series of new streets and public spaces, using massing and height to achieve the required densities but with significant variety in scale and form to respond to neighbouring developments, ensure plenty of light reaches open spaces within the development, and to create visual interest in the streetscapes outside.

At the scale of district / neighbourhood / street

- Trees are retained at parts of the site perimeter and significant new tree planting within the site and adjoining Golf Lane will promote the character and quality of the new streetscape and aid the integration of the new buildings.
- The proposal is not monolithic and avoids long, uninterrupted walls, using step-back in the elevations and a rhythmic variation in building height to provide variety alongside a cohesive design approach. Materials and detailing add to the variety and add distinction to Block B0 in particular,
- The design and height of the proposed buildings are an appropriate response to this strategic location and its immediate context, enabling additional height in development form to be favourably considered in terms of enhancing and reinforcing this location as a distinct neighbourhood and destination within the wider urban area.
- The proposal makes a positive contribution to the improvement of legibility in the wider urban area by way of new development that complements the neighbouring residential areas and neighbourhood centre, and establishing a landmark/gateway building to emphasise its presence and character. In this way, it positively contributes to the mix of uses and/ or building/ dwelling typologies available in the neighbourhood.

At the pre-application stage for this SHD application, Item 1 of the response from An Bord Pleanála sought clarification of the rationale for building height, in terms of its overall strategy, its relationship to neighbouring development and how it features in local and strategic views from the surrounding area.

Sections 4 and 5 of the Architectural Design Statement set out in detail the design approach to height, built form, massing and layout, and to other aspects of the proposed development. Those points are not repeated here, but some of the key aspects of the design approach can be summarised as follows.

Building layout retains some of the perimeter trees and hedgerows as a setting to new buildings and as a ‘soft’ transition to adjacent residential areas and road corridors. The layout also encloses substantial landscaped spaces within the site as a communal setting and amenity space for residents, while also providing separation and privacy for occupants of the buildings. Refer to Figure 6.3 above.

Four-storey blocks provide low-level visual connectivity between taller buildings and enclose the internal courtyard spaces at a more human scale than the taller blocks. They also echo established height in the surrounding developments typically 3-5 storeys high. These low blocks provide openness and visual separation between the taller blocks, allowing light and views of the sky to permeate between the taller blocks. This helps the internal spaces and neighbouring residential areas to avoid an overbearing presence of taller buildings. The significant variety of building heights also creates a dynamic skyline and depth/permeability within the elevation from most vantage points.

The scale and massing of the proposed development responds to the opportunity presented by the site for taller buildings to establish a presence at a key node on the motorway network which provides a southern gateway into Dublin City and access to the emerging neighbourhood centre ‘The Park’ at Carrickmines. The scale of development responds to existing office/retail park (up to five commercial storeys) and permitted development at ‘Q3’ of The Park at 3-6 storeys. Refer to Figure 6.11 below.

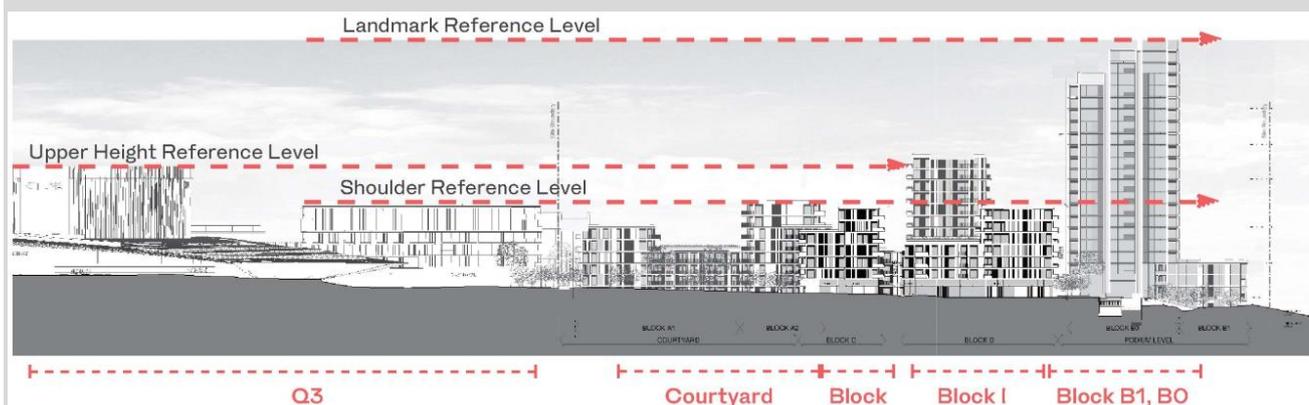


Figure 6.11: Height response to the adjacent neighbourhood centre ‘The Park’ (illustration by Henry J Lyons).

Taller buildings are set out to provide a structured increase in height, beginning at 4-6 storeys at the junction of Glenamuck Road and Golf Lane, graduating upwards towards the motorway and peaking at 18-22 storeys. This creates a transition from lower height adjoining existing residential / public areas towards maximum height as part of a landmark statement within the wider urban landscape.

Monitoring

During the operational phase of the proposed development, impacts upon landscape character and visual amenity will be minimised through high standards of ongoing maintenance and management of buildings, open spaces and soft landscaping.

15.3.6 Land and Soils

Construction Phase

L&S CONST 1:

The mitigation measures proposed for implementation during the construction phase are set out in the Construction and Environmental Management Plan [CEMP] and include the following:

- Stripping of topsoil will be carried out in a controlled and carefully managed way.
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.
- Topsoil stockpiles will also be located on site so as not to necessitate double handling.
- Topsoil will be re-used where possible in gardens and landscaped areas.
- Disturbed subsoil layers will be stabilised as soon as practicable. Therefore, backfilling of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping, will all be carried out promptly to minimise the duration that subsoil layers are exposed to the effects of weather.
- Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles.
- Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection and earth bunding adjacent to open drainage ditches).
- Where feasible, excavated material will be reused as part of the site development works (e.g. for landscaping works and for backfill in trenches under non-trafficked areas).
- The bedrock material excavated during construction will be crushed, screened and tested for use within the designed works to reduce the volume of material required to leave the site. This will also reduce the volume of material to be imported to the site.
- Subsoil drainage systems will be installed to manage groundwater flow paths.
- Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site.
- Construction site mitigation such as wheel wash and dust suppression measures will be implemented as part of the construction process and will be detailed the appointed contractor's construction management plan.
- All oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area,
- Refuelling and servicing of construction machinery will take place in a designated hardstanding area.

Operational

L&S OPER 1:

The mitigation measures proposed for implementation during the operational phase include the following:

- The surface water run-off from the development will be collected by an appropriately designed system. This system should ensure that contaminants are removed prior to discharge e.g. via a light liquids separator or by an appropriate treatment train of Sustainable Urban Drainage Systems as outlined in the Greater Dublin Strategic Drainage Study (GSDSDS). Any separators and drainage systems will be maintained and operated in accordance with the manufacturers recommendations.
- Ensuring appropriately designed, constructed and maintained site services will protect the soils and geology from future contamination arising from operation of the development.

Monitoring

Soil removed during the construction phase will be monitored to maximise potential for re-use on site. Monitoring of any hazardous material stored on-site will form part of the proposed Construction & Waste Management Plan. A dust management/monitoring programme will be implemented during the construction phase of the development. The quantities of topsoil, subsoil and rock removed off site will be recorded.

No monitoring is required during the operational phase.

15.3.7 Water

Construction Phase

WAT CONST 1: General Site Works

- Implement best practice construction methods and practices complying with relevant legislation to avoid or reduce the risk of contamination of watercourses or groundwater.
- A Site Specific Construction and Environment Management Plan will be developed and will be implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the Construction and Environment Management Plan.
- Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
- Weather conditions and seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations, with an objective of minimising 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.
- Precast concrete units fabricated off site will be specified for and bridging structures with cast on-site requirements minimised.
- Instream works will be in accordance with the requirements of the Office of Public Works (OPW) and Inland Fisheries Ireland (IFI).
- Concrete batching will take place off site.
- Concrete wash down and wash out of concrete trucks will take place off site or in an appropriate facility.
- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
- Oil and fuel stored on site for construction will be stored in designated areas. These areas shall be bunded and will be located away from surface water drainage and features.
- Refuelling of construction machinery shall be undertaken in designated areas away from surface water drainage to minimise potential contamination of the water environment. Spill kits shall be kept in these areas in the event of spillages.
- Hazardous construction materials shall be stored appropriately to prevent contamination of watercourses or groundwater.
- Spill kits shall be kept in designated areas for re-fuelling of construction machinery.
- Dewatering measures will only be employed where necessary.
- Exclusion zone created along watercourse by erection of 1m high barrier with relevant signage to notify site users no construction activity or discharge of any kind is permitted in this exclusion zone.

WAT CONST 2: Bridge Works

The bridge design avoids works within the watercourse. The Inland Fisheries Ireland's guidelines to achieve best practice will be observed during the construction phase and the following mitigation measures will be implemented:

- Best site management practice for the control of silt and solids discharge into the watercourse.
- Excavation must be properly monitored; all topsoil is to be stored at a safe distance from the excavation.
- Earthworks to allow construction of abutments will be carried out to reduce existing ground levels to formation/foundation levels. Soil heap locations to be detailed in the appointed contractor's detailed construction management plan.

- Crane Setup for installation of main spans. Temporary access routes for craneage to be agreed prior to construction and be detailed in the contractor's detailed construction management plan. Construction of hard standing including foundations for crane outriggers need to be included.
- Prefabricated beams transportation. Delivery of precast elements to site. Storage area of prefabricated elements to be defined in contractor's construction management plan within reach of crane to minimise further disruption/construction traffic at river edge.
- Placement of prefabricated bridge beams. Crane position to be designed to minimise movements near river edge.
- Demobilisation of crane.

Operational Phase

WAT OPER 1:

The completed development will result in a permanent change to the existing natural surface water processes on the current greenfield site. However, as a large proportion of runoff is routed through SuDS features these will have an attenuating effect which would reduce the rate of stormwater runoff for every rainfall event. Also, SuDS features would reduce the runoff volume through evaporation, transpiration, infiltration and depression storage of the water within each system.

Surface water run-off discharge rates from the development site may be increased because of increase in impermeable surfaces, shorter flow paths through pipes and reduced roughness co-efficient, however the implementation of SuDS features would aim to maintain runoff rates at or below existing greenfield runoff rates.

Greater run-off volumes generated by the impermeable surfaces will require stormwater storage within the site to provide protection against pluvial flooding events. Surface water attenuation storage will need to be incorporated into the design to safeguard against storms and associated flooding throughout the lifetime of the development. Refer to the 'Site Specific Flood Risk Assessment', (SSFRA) prepared by DBFL.

The rate of discharge from the proposed development will not be greater than existing "Greenfield" runoff levels. Therefore, the development itself should pose no increased risk of pluvial flooding in the area. Best Management Practices will be incorporated into all surface water infrastructure / SuDS design within the proposed development site. The inclusion of a well-designed SuDS solution for the proposed development site will further negate the risk of any pollution from normal activities within the development itself.

Proposed levels within the development site are set to ensure overland flooding is directed towards open spaces or the Golf stream during storm events exceeding 1%AEP.

There is no perceived impact on the Golf stream or Carrickmines River caused by the proposed development as all discharge from the site will be controlled to greenfield runoff rates, as is the current situation on the undeveloped site. Furthermore, through the introduction of Sustainable Drainage Systems throughout the site, the quality of surface water runoff to the stream will be maintained at or as close to greenfield standards as possible.

For a further detailed information on the surface water strategy and management, refer to DBFL report 170063-REP-001 Infrastructure Design Report.

The potential impact from the operational phase on surface water is likely to be long term and low. The potential impact on water quality does not arise during the operation phase.

Monitoring

All surface water drainage works will be approved by Dun Laoghaire Rathdown County Council, Municipal Services Department, and will be carried out in accordance with the GDR COP (Greater Dublin Regional Code of Practice for Drainage Works).

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

- The appointment of a management company will ensure the surface water network 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 and gullies will be implemented to prevent contamination and increased runoff from the site.
- Although no specific monitoring will be required as part of the proposed development, it is envisaged that EPA Monitoring of the surrounding watercourses will continue in the area through the life of the development.

15.3.8 Air Quality & Climate

Construction Stage

Air Quality

AIRCONST1: The proactive control of fugitive dust will ensure the prevention of significant emissions. The key aspects of controlling dust are listed below. Full details of the dust management plan can be found in Appendix 9.3. These measures have been incorporated into the overall Construction Environmental Management Plan (CEMP) prepared in respect of the proposed development.

In summary the measures which will be implemented will include:

- 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.
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

Climate

AIRCONST2: Demolition and construction stage traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the development. Construction vehicles, generators etc., may give rise to some CO₂ and N₂O emissions. However, due to short-term nature of these works, the impact on climate will not be significant.

Nevertheless, some site-specific mitigation measures will be implemented during the construction phase of the proposed development to ensure emissions are reduced further. In particular, the prevention of on-site or delivery

vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

Operational Stage

AIR OPER 1: Impacts to climate can occur as a result of electricity usage for heating and lighting from the proposed development. However, the proposed development has been designed to reduce the impact to climate as much as possible during the operational phase. The Building Lifecycle Report and Sustainability & Energy Statement prepared by JAK Consulting Engineers in support of this planning application outline the measures to be implemented to reduce impacts to climate. Firstly, the proposed development is located in close proximity to a number of good transport and cycling routes including Luas and bus routes which will promote more sustainable modes of transport and reduce GHG emissions. The residential units will comply with the Part L (2019) building regulations and will be Nearly Zero Energy Buildings (NZEB) compliant. The key design elements outlined in the Sustainability & Energy Statement include:

- High performance triple glass in the windows.
- High levels of insulation.
- A+ Low energy LED lighting throughout the development.
- High levels of air-tightness of the dwellings.
- High efficiency heat pump for each unit serving heating, hot water and ventilation requirements.

In addition, natural lighting will be utilised as much as possible with artificial lighting to include LEDs to reduce energy demand and thus GHG emissions from electricity supply. Natural ventilation will be used in the basement areas where possible to avoid the need for mechanical systems and reduce the building's energy demand. Bicycle parking facilities will be provided to promote the use of more sustainable transport modes. Electric vehicle charging infrastructure will be incorporated into the design to allow for E-car charging points to be installed as required. Full descriptions of the measures proposed and their benefits are outlined within the Sustainability & Energy Statement and the Building Lifecycle Report submitted with this application.

Monitoring

Construction Stage

Monitoring of construction dust deposition at 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 between 28 - 32 days.

Operational Stage

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

13.3.9 Noise & Vibration

Construction Phase

N&V CONST 1: With regard to construction activities, best practice control measures from construction sites within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open

Sites Parts 1 and 2 will be used to control noise and vibration impacts. The implementation of all best practice noise and vibration control methods will ensure impacts to nearby residential noise sensitive locations are not significant. This will be particularly important during excavation and foundation construction which are likely to be the activities to have the highest potential noise and vibration impact.

Noise-related mitigation methods are described below and will be implemented for the project in accordance with best practice. These methods include:

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise;
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations;
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;
- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;
- During construction, the contractor will manage the works to comply with noise limits outlined in BS 5228-1:2009+A1 2014. Part 1 – Noise;
- All items of plant will 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;
- Limiting the hours during which site activities which are likely to create high levels of noise or vibration are permitted;
- Monitoring levels of noise and vibration during critical periods and at sensitive locations.

Furthermore, it is envisaged that a variety of practicable noise and vibration control measures will be employed. These will include:

- Selection of plant with low inherent potential for generation of noise and/ or vibration;
- Erection of good quality site hoarding to the site perimeters which will act as a noise barrier to general construction activity at ground level;
- Erection of barriers as necessary around items such as generators or high duty compressors, and;
- Situate any noisy plant as far away from sensitive properties as permitted by site constraints.
- Where practicable, localised screening should be used during breaking activities to obscure line of site to the closest sensitive receptors.

Operational Phase – Mechanical Plant Noise

N&V OPER 1: As part of the detailed design of the development, plant items with appropriate noise ratings and, where necessary, appropriately selected remedial measures (e.g. enclosures, silencers etc.) will be specified in order that the adopted plant noise criteria is achieved at the façades of noise sensitive properties, including those within the development itself.

N&V OPER 2: As is the case in most buildings, the glazed elements and ventilation paths of the building envelope are typically the weakest element from a sound insulation perspective. In general, all wall constructions (i.e. blockwork or concrete and spandrel elements) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal. It's also noted that the ventilation strategy will be for Mechanical Ventilation Heat Recovery units which are expected to provide strong sound insulation to external noise, hence ingress of noise through the ventilation systems is considered to be negligible for this assessment.

In this instance the facades highlighted in Figure 10.11 will be provided with glazing that achieves the minimum sound insulation performance as set out in Table 10.11. Other facades in the development have no minimum requirement for sound insulation. Note that the calculations to determine these requirements have taken into account a potential increase in noise due to traffic along the facades facing directly onto the road.

Ref	SRI (dB) per Octave Band Centre Frequency (Hz)						dB R _w
	125	250	500	1k	2k	4k	
RED	29	30	37	44	44	44	41
BLUE	26	27	34	40	38	46	38
GREEN	23	23	30	39	36	43	35

Table 10.11: Sound Insulation Performance Requirements for Glazing, SRI (dB)

The overall R_w and D_{n,e} outlined above are provided for information purposes only. The over-riding requirements are the octave band sound insulation performance values which may also be achieved using alternative glazing and ventilation configurations. Any selected system will be required to provide the same or greater level of sound insulation performance as that set out in Tables 10.11 and 10.12.

It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing and ventilation systems. In the context of the acoustic performance specification the 'glazing system' is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc.

The assessment has demonstrated that the recommended internal noise criteria can be achieved through consideration of the proposed façade elements at the design stage. The calculated glazing and ventilation specifications are preliminary and are intended to form the basis for noise mitigation at the detailed design stage. Consequently, these may be subject to change as the project progresses.

Monitoring

There is a requirement to ensure that construction activities operate within the noise and vibration limits set out in the EIAR. There is also a requirement to undertake regular noise and vibration monitoring at locations representative of the closest sensitive locations to ensure the relevant criteria are not exceeded.

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

Vibration monitoring shall be conducted in accordance with BS 6472 for human disturbance and BS ISO 4866:2010 for building damage.

15.3.10 Wind

Design related mitigation measures have been incorporated into the scheme design and are reflected in the application drawings / proposals submitted for approval. No additional construction or operational related mitigation measures are recommended.

Monitoring

No monitoring measures are proposed for the operational phase of the proposed development with respect to Wind impacts.

15.3.11 Material Assets

Construction Phase

MA CONST 1: The proposed development will comply with the provisions of the Construction and Demolition Waste Management Plan and Operational Waste Management Plan with respect to construction waste.

MA CONST 2: A construction and environmental management plan, including measures for construction traffic management, has been submitted with the EIAR and will be implemented in order to protect local amenities and the integrity and operation of the local road network during the construction phase.

MA CONST 3: Provision of utilities will be carried out in accordance with the recommendations of the relevant statutory bodies and providers (ESB, Gas Networks Ireland, Irish Water, EIR, DLRCC etc.)

MA CONST 4: Water Metering will be included in each unit to record consumption.

Operational Phase

No mitigation measures are considered necessary during the operational phase.

Monitoring

Monitoring measures will be in accordance with provisions outlined elsewhere in this EIAR document.

15.3.12 Transportation

Construction Phase

TRANS CONST 1: The Preliminary Construction & Environmental Management Plan incorporates a range of integrated control measures and associated management initiatives with the objective of mitigating the impact of the proposed development's on-site construction activities.

In order to ensure satisfactory operation of the construction phase, the following construction phase traffic mitigation measures are proposed:

- Consolidation of delivery loads to / from the site and management of large deliveries on site to occur outside of peak periods;
- Use of precast / prefabricated materials where possible;
- "Cut" materials generated by the construction works to be re-used onsite where possible, through various works;
- Adequate storage space on site to be provided;
- The design of the works has involved an element of minimising the quantity of material to be removed from site by way of cut and fill balance;
- Scheduling of movements to outside peak traffic times and school pick-up / drop-off times.
- Finally, truck wheel washes will be installed at construction entrances and any specific recommendations with regard to construction traffic management made by the Local Authority will be adhered to.

Operational Phase

TRANS OPER 1: A package of integrated measures has been identified to both manage and off-set the additional local demand that the proposed residential 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 Mobility Management Plan (MMP) (which has been submitted as apart of this planning application) with the aim of guiding the delivery and management of coordinated initiatives by the scheme

promotor. The MMP ultimately seeks to encourage sustainable travel practises for all journeys to and from the proposed development.

- Infrastructure – The provision of an appropriate number of cycle parking facilities to encourage the uptake of cycling by residents
- Infrastructure – New formal road crossing facilities on Glenamuck Road South as part of approved Planning Ref. D18A/0257 which will encourage walking, cycling and public transport use by residents.

Monitoring

Construction Phase Monitoring Strategy

During the construction stage, the following monitoring exercises are proposed;

- Compliance with construction vehicle routing practices;
- Compliance with construction vehicle parking practices;
- Internal and External road conditions; and
- Timings of construction activities in terms of start / finish times.

Operational Phase Mitigation Strategy

As part of the MMP process (a MMP has been submitted as part of this planning application), bi-annual post development travel surveys are recommended to be carried out by the appointed mobility manager in order to determine the success of the measures and initiatives as set out in the proposed MMP document. The surveys should be circulated among residents. The information obtained from the monitoring surveys will be used to identify ways in which the MMP measures and initiatives should be taken forward in order to maintain and further encourage sustainable travel characteristics.