18 SUMMARY OF MITIGATION MEASURES

18.1 Introduction

This Chapter of the EIAR collates and summarise the mitigation measures recommended for each of the environmental topics examined in Chapters 5 – 17 of this EIAR.

These mitigation measures and any associated monitoring comprise what would be implemented during the Construction and Operational Phase to reduce the potential for significant adverse impact of the proposed development on the environment.

This chapter does not expand on the reasoning or expected effectiveness of the proposed mitigation or monitoring measures. For such descriptions, we refer to each of the individual chapters of the EIAR. A number of the recommended mitigation measures would be expected to be required as a condition of any grant of permission by An Bord Pleanála.

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18.2 Proposed Mitigation Measures

18.2.1 Population and Human Health (Chapter 5)

There are no specific mitigation measures proposed for Human Health. Mitigation measures proposed to minimise the potential impacts on human health in terms of air quality, landscape & visual impact and noise & vibration are discussed in the relevant sections of Chapters 9: Climate (Air Quality & Climate Change), Chapter 11: Air (Noise & Vibration) and Chapter 12: Landscape & Visual Impact respectively.

Chapter 13: Material Assets (Transportation), addresses mitigation measures proposed to reduce the impact of additional traffic movements to and from the Proposed Development.

18.2.2 Biodiversity (Chapter 6)

Previous Works

The Proposed Development is in accordance with the provisions of the detailed Local Area Plan (LAP) prepared for the overall Portmarnock South lands (Fingal County Council, 2013).

As part of the Phase 1A development, and again in accordance with the provisions of the LAP, significant mitigation measures were put in place, both within the Phase 1A lands itself, and within the wider lands covered by Portmarnock South LAP. These included the following, which were designed to mitigate any potential impacts on the Special Conservation Interests and Qualifying Interests of Baldoyle Bay SPA and SAC resulting from residential development to be delivered as part of Portmarnock South Local Area Plan: -

- Provision of a large area of Ecological buffer / parkland, located between residential zoned lands within the LAP to the west and the boundary with Coast Road to the east and with Mayne Road to the south.
- Provision of a 'Quiet Zone' for birds, in the southern part of the Portmarnock South Local Area Plan lands.
- Provision of an arable plot and retention of an existing small attenuation pond located between the above 'Bird Quiet Zone' and Mayne Road.

- Clearing of bramble scrub and reseeding of areas to grassland within the Murragh Spit east of the R106 Coast Road (within Baldoyle Bay SAC and SPA), undertaken in 2016 and 2017. This was undertaken, in agreement with Fingal County Council and NPWS, to provide additional areas of foraging habitat for bird species, in particular overwintering light-bellied Brent geese. This area is regularly maintained and remains suitable for use by protected birds.
- Treatment of invasive species listed on Schedule 3 of the Birds and Habitats Regulations, 2011 – 2015 specifically a small area of Japanese knotweed (*Fallopia japonica*) on the Murragh Spit and giant hogweed (*Heracleum mantegazzianum*) located within the Phase 1A lands. The stand of Japanese knotweed is being effectively managed in conjunction with Fingal County Council. A giant hogweed management plan has been in force for the Phase 1A lands over the past 4 years and no giant hogweed growth was observed during 2021. Nevertheless the site will continue to be managed during future Construction Phases to ensure that giant hogweed is fully and permanently eradicated.

These measures have been implemented and are subject to ongoing management, including mowing of the reseeded grass areas within the Murragh and grazing of the grass within the Bird Quiet Zone so as to ensure that the sward length is suitable for foraging light-bellied Brent geese. These measures along with the mitigation measures set out below ensure that no significant impacts arise as a result of the Proposed Development or in combination with other cumulative development.

Proposed Development

Construction Phase

Designated Conservation Areas

Specific mitigation measures for the European sites are contained within the accompanying NIS and the Construction and Environmental Management Plan (CEMP) (prepared by Quintain Developments Ireland Ltd) for the Proposed Development. These include strict measures to ensure the protection of water quality as well as measures to ensure no impact outside the working area and in particular on the habitats and bird species that form the Qualifying Interests and Special Conservation Interests of Baldoyle Bay SAC and SPA.

No mitigation measures are required to prevent any impacts on Sluice Marsh pNHA.

Habitats

All construction works will comply with legislative requirements and best practice as well as Portmarnock South Local Area Plan.

All site clearance and landscaping works will comply with current legislative requirements and best practice. In particular, where it is intended to retain trees within the development, that is along the townland boundary, trees to be retained will be treated in accordance with British Standard BS5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations, with protective fencing being installed prior to commencement of development.

The planting proposed for the development will, wherever possible, comprise an appropriate mixture of native trees and shrubs, preferably of local provenance (refer to the accompanying drawings: Brady Shipman Martin drawing no. 6842-300 series). The planting will also incorporate a range of species that will attract feeding invertebrates, including moths, butterflies and bees. It will take account of and implement the relevant objectives of the All-Ireland Pollinator Plan 2021 – 2025[1].

[1] https://pollinators.ie/wp-content/uploads/2021/03/FINAL-All-Ireland-Pollinator-Plan-2021-2025-WEB.pdf

All planting plans and landscaping proposals will ensure that no invasive species (in particular Japanese knotweed and giant hogweed) are introduced, either deliberately or inadvertently, to the site. The planting will, over time, provide additional habitat of benefit to bats and birds that will continue to use the site.

The lighting will be in compliance with Section 5.7 and Objective PL 1 of the LAP, which requires light intensity zones for the plan lands to ensure that environmental impact is minimised as far as possible in development schemes. Taking this into account, all new lighting for the Proposed Development at Portmarnock Phase 1D will take account of the recommendations of Bat Conservation Ireland (2010). The lighting scheme for the Proposed Development will adhere to the following lighting design characteristics:

- The minimum level of appropriate / required lighting level will be provided within the developed/residential areas;
- Light standards will be fitted with low intensity, horizontal cut-off LED light fittings employing a narrow directional light or cowled light. This will avoid the effect of light spill arising;
- Light standards and associated lighting will be directed away from areas of open space;
- No floodlighting will be used in the development.

A total of five bat boxes (Schwegler 2F) were installed in the tree lines to the south and west of the Proposed Development area, as part of the Phase 1A development. There is no evidence of bats ever having used the boxes erected as part of Phase 1A. Regardless, based on the based on the evidence gathered and presented in Appendix 6.1, it is proposed to install an additional 9 bat boxes to provide new roosting opportunities.

Water

All hazardous substances, such as fuels, oils, cement and concrete products will be stored on-site in secure and bunded areas remote from drainage connections to the existing surface water drainage network. Petrol interceptors will be incorporated. Land disturbance will be limited to the works area, and site entry and egress points will be limited. Vegetation will be maintained as appropriate in and around run-off areas.

The contractor will take adequate precautions as part of the construction methodology to avoid any pollution from construction activities via run-off to the surface water drainage network. These measures may include temporary attenuation and settlement facilities as well as silt fences. The silt fencing, if required, will be regularly cleaned and maintained in good working condition for the duration of development works.

Full details are set out in the accompanying Construction and Environmental Management Plan.

The implementation and effectiveness of the measures proposed will be inspected and recorded regularly during the entire works period and where deficiencies or faults are identified the contractor will immediately remedy them. These measures will ensure that there will be no impacts on water quality as a result of the Proposed Development works.

Other Issues

Japanese knotweed and giant hogweed, species listed on Schedule 3 of the Birds and Habitats Regulations, 2011 – 2015, have been recorded in the past in the local area, including within the Murragh Spit (within Baldoyle Bay SAC and SPA) and within development areas Phase 1A and 1B (but not Phase 1C or Phase 1D). Long-term management of these species has been undertaken and will continue to be carried out into the future, until it is confirmed that the species are eradicated from the subject area.

Operational Phase

Surface Water

As noted in 6.5.2.2 the regional wetland, to which Phase 1D will be connected, is operational in compliance with the planning conditions related to the Phase 1B development. This will ensure that there will be no long term impacts on surface water quality once the Proposed Development is operational.

The overall development is designed in accordance with the principles of SuDS as embodied in the recommendations of the GDSDS, which addresses the issue of sustainability by requiring designs to comply with a set of drainage criteria which aim to minimize the impact of urbanization, by replicating the run-off characteristics of the greenfield site. The criteria provide a consistent approach to addressing the increase in both rate and volume of run-off, as well as ensuring the environment is protected from any pollution from roads and buildings. No corresponding mitigation measures are required.

Foul Water

As set out in detail in the Water Services Report (JB Barry) that accompanies the SHD Planning Application and is submitted under separate cover, the lands in Portmarnock South lie within the North Fringe Sewer catchment, which discharges to the Ringsend Wastewater Treatment Plant, which is undergoing significant upgrades.

It is intended to connect the foul sewerage from the proposed 172no. residential units of this Proposed Development to the existing foul sewer network in the Portmarnock South LAP lands. The connection will be to the permitted Phase 1C development, which is currently under construction, immediately to the north of this proposed Phase 1D development.

Foul water discharge from the site will connect to the public sewer network. It will be directed to the Irish Water Wastewater Treatment Plant (WwTP) at Ringsend prior to discharge to Dublin Bay. The Ringsend WwTP operates under licence from the EPA (Licence no. D0034-01) and received planning permission (ABP Ref.: 301798) in 2019 for upgrade works, which are expected to be completed within five years. This will increase the plant capacity from 1.65m PE (population equivalent) to 2.4m PE. Regardless of the status of the WwTP upgrade works, the peak discharge from the Proposed Development is not significant in the context of the existing capacity available at Ringsend. Though the WwTP is currently over capacity (the plant is currently accommodating 1.9m PE), recent water quality assessment undertaken in Dublin Bay (published by the EPA) confirms that Dublin Bay is classified as “unpolluted” and there is no evidence that the over-capacity issues at Ringsend are affecting the conservation objectives of the European sites in Dublin Bay.

Operational impacts related to foul water management, in the context of biodiversity, as a result of the Proposed Development, will not be significant.

18.2.3 Land, Soils, Geology & Hydrogeology (Chapter 7)

Construction Phase

The following mitigation measures have been identified which form part of the CEMP which will include measures for reduction or elimination of pollution of soils and groundwater. An Outline Waste Management Plan will be produced for the project , which will include a waste forecast identifying options for reuse, recycling and avoidance of landfill and to record actual waste. Refer to CEMP prepared for this SHD Planning Application for further details.

Excavation and Earthworks, Surplus and Unsuitable Soils

Soft materials and surplus soils that are excavated will be reused, for bunds, landscaping etc.

To mitigate densification of the soil due to construction activities, all topsoil shall be removed and stored in advance of earthworks, the surface shall be scarified, and the topsoil replaced and reseeded upon completion.

Accidental Spillages - Contamination of Soils and Groundwater

Contractor Guidance set out in the Control of Water Pollution from Construction Sites (CIRIA, 2001) shall be adhered to. Good construction management practices will be employed. During the Construction Phase, all potentially harmful substances (e.g. oils, diesel, herbicides, pesticides, concrete etc.) will be stored in accordance with the manufacturer's guidelines regarding safe and secure buildings / compounds: -

- Designated impermeable cement washout areas will be provided or prohibited from site.
- All oils and fuels will be stored in bunded tanks with the provision of a storage / retention capacity of 110% of tank storage. Care and attention will be taken during refuelling and maintenance operations.
- Adequate means to absorb or contain any spillages of these chemicals will be available at all times.
- Any soil contaminated from an accidental spillage will be contained and treated appropriately and disposed of in accordance with the Waste Management Act 1996 – 2011.

Refer to CEMP prepared for this SHD Planning Application for further details.

Operational Phase

As there are no Operational Phase perceptible impacts on the land, soils and hydrogeological environments due to the Proposed Development, no mitigation is proposed.

Cumulative Mitigation

The proposed mitigation measures for this phase of the Proposed Development equally apply to the future phases and will have the same reduction in the significance of the potential impacts.

18.2.4 Water (Chapter 8)

Proposed Development

Construction Phase

The appointed contractor to carry out the construction work for this development, will be required to prepare a site-specific CEMP which will include the following measures to minimize or reduce the risk of pollution events occurring;

- Within the works, temporary earth bunds/silt fences will be constructed to contain surface water run-off and channel it to a silt trap or settlement pond before discharge to the drainage network.
- Any excavated soil is to be temporarily stockpiled at least 20m from any ditch or drainage network or other waterbodies in order to reduce the likelihood of any suspended solids reaching them.
- Excavation and stockpiling works to be curtailed during sustained wet weather periods.
- SuDS features forming part of the development and in particular those for the proposed access road to Moyne Road, will be constructed early in the works programme.
- Ditch Culvert and Headwalls for Mayne Access Road to be Precast Concrete.

- Designated impermeable fuelling areas will be constructed. All oils and fuels will be stored in bunded tanks with the provision of a storage/retention capacity of 110% of tank storage.
- Pouring of cement-based materials for works will only be carried out in dry conditions.
- Care and attention to be taken during refuelling and maintenance operations. Drip trays and spill kits to be available on site.
- Chemicals to be stored in dedicated, secure bunded storage.
- Discharge points to the drainage network will entail a mechanism for containment of runoff in the event of accidental spillage, to enable clean-up and appropriate disposal through licensed facilities.
- Contractor Guidance set out in the Control of Water Pollution from Construction Sites (CIRIA, 2001) shall be adhered to.
- Environmental Good Practice on Site (CIRIA 2005) to be implemented and followed.
- Any soil contaminated from an accidental spillage will be contained and treated appropriately and disposed of in accordance with the Waste Management Act 1996-2011.

Refer to CEMP prepared for this SHD Planning Application for further detail.

With the introduction of these mitigation measures, the significance of the potential construction impacts, identified earlier, are considered to reduce since they either remove the source of potential impact and / or place barriers to the pathways for such impact events.

Operational Phase

The following measures are incorporated in the design of the Proposed Development, which when implemented will mitigate any potential impacts currently identified: -

- The drainage design follows a sustainable drainage strategy (SuDS) i.e. mitigation by design, and as such any surface water runoff will follow a surface water management train approach with the focus not only on controlling the quantity of discharge flows through attenuation, but on providing treatment storage to remove pollutants and thus improve quality of water being discharged to the estuary. The key component of this approach is the Regional Wetland which is already constructed.
- Various SuDS devices will be utilised upstream within the Proposed Development (Swales, Permeable Pavement Parking Bays, Filter Strips, Filter Drains, Tree Pits, Petrol/Oil Interceptors) and storm water runoff from the development will pass through a minimum of three devices.
- Floor levels will be significantly greater than +4.73mOD.
- The interim foul pumping station will have a maintenance agreement in place until such time as it is decommissioned.
- Foul pumping station flows will be recorded to ensure in line with Irish Water agreements.

With the introduction of these mitigation measures, the significance of the potential operational impacts identified earlier are considered to reduce since they either remove / minimise the source of potential impact and / or place barriers to the pathways for such impact events.

Cumulative

The proposed mitigation measures for this phase of the Proposed Development equally apply to current and future phases and will have the same reduction in the significance of the potential impacts.

Again, it is envisaged that the proposed Irish Water Portmarnock Bridge Pumping Station with rising main direct to North Fringe Sewer will be operational within their likely development timelines, however the proposed upgrades to the interim foul pumping station serving this and future developments, will enable it to continue to function until such time as this is the case.

18.2.5 Climate (Air Quality & Climate) (Chapter 9)

Proposed Development

Construction Phase

Air Quality

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the Dust Management Plan. The key aspects of controlling dust are listed below. Full details of the Dust Management Plan can be found in Appendix 9.2. These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site.

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 must 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.
- Drop heights from conveyors, loading shovels, hoppers and other loading equipment should be minimised, if necessary fine water sprays should be employed.

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

Construction Phase 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 Proposed Development. Construction vehicles, generators etc., may give rise to some CO_2 and N_2O emissions. However, due to short-term nature of these works, the impact on climate will not be significant.

Nevertheless, some site-specific mitigation measures can 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 Phase

The impact of the Proposed Development on air quality and climate is predicted to be imperceptible with respect to the operational phase in the long term. Therefore, no site specific mitigation measures are required.

The Proposed Development has been designed to minimise the impact to climate where possible during operation. Details of the measures to be incorporated into the design of the development are outlined in Section 9.5.1.2 and within the Sustainability & Energy Statement, by JAK Consulting Engineers prepared in support of this planning application.

18.2.6 Climate (Sunlight & Daylight) (Chapter 10)

The subject application proposes the development of a greenfield site zoned for development, within the Portmarnock South LAP. In these circumstances, during the Construction or Operational Phases scope for mitigation measures, which would preserve a sustainable level of density, is limited.

18.2.7 Air (Noise & Vibration) (Chapter 11)

In order to ameliorate the likely noise impacts, a schedule of noise control measures has been formulated for both construction and operational phases.

Construction Phase

With regard to construction activities, best practice operational and 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.

BS5228 includes guidance on several aspects of construction site practices, including, but not limited to: -

- Selection of quiet plant.
- Control of noise sources.
- Screening (boundary, and or localised plant screening).
- Hours of work.
- Liaison with the public.
- Monitoring.

Detailed comment is offered on these items in the following paragraphs. 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 monitoring.

Selection of Quiet Plant

This practice is recommended in relation to sites with static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures where possible. 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.

Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration should 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.

BS5228 states that "as far as reasonably practicable sources of significant noise should be enclosed". In applying this guidance, constraints such as mobility, ventilation, access and safety must be taken into account. Items suitable for enclosure include pumps and generators.

BS5228 makes a number of recommendations in relation to "*use and siting of equipment*". These are all directly relevant and hence are reproduced below. These recommendations will be adopted on site.

> *"Plant should always be used in accordance with manufacturers' instructions. Care should be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading should also be carried out away from such areas.*
>
> *Machines such as cranes that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. Machines should not be left running unnecessarily, as this can be noisy and waste energy.*
>
> *Plant known to emit noise strongly in one direction should, when possible, be orientated so that the noise is directed away from noise-sensitive areas. Attendant operators of the plant can also benefit from this acoustical phenomenon by sheltering, when possible, in the area with reduced noise levels.*
>
> *Acoustic covers to engines should be kept closed when the engines are in use and idling. The use of compressors that have effective acoustic enclosures and are designed to operate when their access panels are closed is recommended.**
>
> *Materials should be lowered whenever practicable and should not be dropped. The surfaces on to which the materials are being moved could be covered by resilient material."*

Other forms of noise control at source relevant to the development works are set out below: -

- For mobile plant items such as cranes, 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 10dB. Mobile plant should be switched off when not in use and not left idling.
- For percussive tools such as pneumatic concrete breakers and tools a number of noise control measures include fitting muffler or sound reducing equipment to the breaker 'tool' and ensure any leaks in the air lines are sealed. Erect localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries.
- 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.
- Demountable enclosures can also be used to screen operatives using hand tools/ breakers 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.

Screening

Typically 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. The effectiveness of a noise screen will depend on the height and length of the screen and its position relative to both the source and receiver.

Screening may be a useful form of noise control when works are taking place at basement and ground level to screen noise levels at ground floor adjacent buildings.

In addition, careful planning of the site layout should also be considered. The placement of site buildings such as offices and stores and in some instances materials such as aggregate can provide a degree of noise screening if placed between the source and the receiver. The use of localised mobile (mobile hoarding screens and / or acoustic quilts) to items of plant with the potential to generate high levels of noise are an effective noise control measure. These options should be considered when percussive works are taking place in close proximity to the nearest sensitive perimeter buildings.

Liaison with the Public

A designated noise liaison should be appointed to site during construction works. All noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, prior to particularly noisy construction activity, e.g. demolition, breaking, piling, etc., the liaison officer should inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

Hours of Work

Construction works will be undertaken within the times below, taken from the Section 6 of the Draft Construction Management Plan: -

- Monday to Friday 07:00 to 19:00hrs
- Saturday 07:00 to 14:00hrs
- Sunday and Public Holidays No noisy work on site.

Operational Phase

Building Services Plant

During the detailed design of the development, the selection and location of mechanical and electrical plant will be undertaken in order to ensure the noise emission limits set out above are not exceeded. Plant items in the proposed development are limited to domestic heating and ventilation equipment and therefore no specific mitigation measures are required.

Additional Traffic on Surrounding Roads

During the operational phase of the Proposed Development, noise mitigation measures with respect to the (outward) impact of traffic from the development are not deemed necessary.

Inward Impact

At detailed design stage, glazing and vent specifications fulfilling the requirements in Section **Error! Reference source not found.** will ensure suitable internal noise levels.

18.2.8 Landscape & Visual Impact Assessment (Chapter 12)

Proposed Development

Construction Phase

Mitigation measures are proposed to avoid, reduce or remediate, wherever possible significant negative landscape and visual effects of the Construction Phase of the Proposed Development. In addition to the operation and management of all construction works in accordance to best methodologies and practice, that following measures are proposed for the mitigation of landscape / townscape and visual impacts: -

- Construction works will be guided by a Construction Environmental Management Plan (CEMP), which shall provide the environmental management framework to be adhered to and monitored during the pre-commencement and Construction Phases of the Proposed Development. The CEMP will incorporate all of the mitigating principles required to ensure that the work is carried out in a way that minimises the potential for environmental impacts to occur.
- Construction compounds will not be located within the root protection area of trees or hedgerows to be retained and will be enclosed by solid hoarding. The compound areas will be fully decommissioned and reinstated at the end of the Construction Phase.
- Trees, hedgerows and vegetation to be retained within and adjoining the works area will be protected in accordance with 'BS 5837:2012 Trees in relation to in relation to design, demolition and construction. Recommendations'. Works required within the root protection area (RPA) of trees, hedgerows to be retained will follow a project specific arboricultural methodology for such works, prepared / approved by a professional qualified arborist.
- Trees and vegetation identified for removal will be removed in accordance with 'BS 3998:2010 Tree Work – Recommendations' and best arboricultural practices as detailed and monitored by a professional qualified arborist.
- The Phase 1D construction Site will be fully enclosed and secured. Construction traffic accessing the Site will follow agreed routes and public roads will be maintained in a clean and safe manner.

Mitigation of landscape and visual impacts during the Construction Phase is focused on ensuring protection of elements to be retained (e.g. mature hedgerows) and providing for a degree of visual screening of particular aspects of the works (e.g. the construction compounds).

Operational Phase

The Operational Phase of the Proposed Development will not give rise to significant landscape and visual effects and therefore measures for the mitigation of significant landscape and visual impacts are not required. Nevertheless, the Proposed Development includes a number of measures which will ensure its integration within its setting. The Proposed Development includes: -

- Provision of a high-quality of architectural design, character and finish for the proposed buildings and development.
- Provision of significant areas of new and connected open space and park with play facilities as amenity and recreation for the new communities. The open spaces provide for retention and incorporation of townland boundaries and tree-lined hedgerows.

- Planting of new trees along streetscapes and within open spaces. Species selected will be appropriate to the street environment and to the characteristics of this coastal edge location.
- Provision of a high-quality of design and finish for landscape areas within the Proposed Scheme.
- Landscape areas will be maintained for twelve months during which any defective or dead material will be replaced.
- Open Spaces, including Skylark Park will be offered for taking-in-charge by FCC.

18.2.9 Cumulative

Construction Phase

N/A

Operational Phase

N/A

18.2.10 Material Assets (Transportation) (Chapter 13)

Proposed Development

With the objective of mitigating the potential impact of the Proposed Development during its Construction and Operational Phase, the following proposals have been identified and subsequently form an integral part of the subject development proposals.

Construction Phase

Managing construction traffic is an ongoing collaborative process. In advance of work starting on site the works Contractor will prepare a updated and revised construction management plan and traffic management plan to be submitted to Fingal County Development Plan for approval. Refer to Construction Environmental Management Plan prepared for this application for further details.

The Construction Phase management plan will be based on the plans used for the previous phases of the development, it will act as a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the Construction Phase and will include the relevant mitigation measures outlined in the EIAR and any subsequent conditions relevant to the Proposed Development. The document will include lessons learned from the previous phases. The following mitigation measures have been identified which will form part of a plan: -

- Good construction management practices will be employed such as fencing the site off from the public and neighbouring sites, adequate external/internal signage, secure internal site offices, dedicated construction access points all to ensure the safety construction staff and the public.
- Appropriate levels of staff parking and compounding will be provided to ensure no potential overflow or haphazard parking in the area. The Site will be able to accommodate employee and visitor parking throughout.
- Set construction traffic routes to and from the site will be agreed with FCC prior to the commencement of constructions activities onsite. The time of day permittable for such routes will also be agreed upon and outside of the morning / evening peak hours.
- Wheel wash facilities will be provided on site to ensure that construction debris will not have an impact on the quality of roads in the Portmarnock area.

Mitigation measures as part of previous phases of the development have already been introduced, as construction traffic is forbidden from travelling through Junction 1: Station Road / Drumnigh Road junction and will have to use the Coast Road as outlined in Section 13.4.1.1. Additionally, it is important to note that Permission was granted (F20A/0700 – May 2021) for the construction of a new temporary Haul Road to the south connecting into Moyne Road, to link both the development under construction (1C) and any future phases, until such time as the permanent Access Road to Moyne Road is delivered under this Proposed Development. This temporary Haul Road will be completed in December 2021.

When complete, the new temporary Haul Road (and future Access Road) will allow construction traffic to access the site from the south, minimising the interaction with Phases 1A / B / C, the Station Road junctions and the general public.

Operational Phase

A number of measures have been and will be implemented prior to the subject scheme opening which include: -

- **Junction Upgrades:** As outlined in section 13.4.1.1, a number of proposed junction upgrades are planned for the area. Junction H: Hole in the Wall Road is nearing completion which will greatly increase traffic capacity in the area. Junction 1: Drumnigh Road / Station Road will be improved with traffic calming measures and changes to the kerb lines/footpaths. The Junction 2: Strand Road / Coast Road / Station Road mini roundabout will be turned into a signalised junction. All three junction upgrades will improve traffic movements in the area, improve road safety, and for Junctions H and 2, provide a safer environment for pedestrians and cyclists, encouraging sustainable transport.
- **Parking:** All car parking and bicycle parking within the development will comply with the Development Plan. The apartments and duplex units within all phases have been provided with cycle parking in excess of the Development Plan minimum requirement. It was agreed with Fingal County Council that a sustainable approach to parking would be incorporated into the development. This leads to a strong emphasis on bicycle parking, thus reducing the need for private single occupancy vehicles.
- **Mobility Management (MMP):** A MMP is to be rolled out with the aim of guiding the delivery and management of coordinated initiatives by the scheme promotor. The MMP ultimately seeks to encourage sustainable travel practices for all journeys to and from the Site. Details of the MMP are contained below.

Mobility Management Plan

Introduction

A Mobility Management Plan, also known as a Travel Plan, is a long-term management strategy which identifies a package of measures to encourage residents and visitors to use sustainable forms of transport such as walking, cycling and public transport and to reduce dependency on private car single-occupancy use. By providing for the transportation needs of people and goods in an ordered and planned manner the environmental, economic and social impacts of travel may be greatly reduced. This section of the EIAR relates to Mobility Management and outlines it's aims/objectives and an action plan to achieve these objectives and how to implement this plan.

The objective of this Mobility Management section of the EIAR is to improve accessibility to the site, whilst providing a more sustainable approach to the site's transportation requirements.

Developing this plan will allow the development of managed travel options and more informed travel choices for residents and visitors whilst reducing dependency on private car use associated primarily with commuter travel.

Upon completion and occupation of the development, this Mobility Management Plan will provide the basis for an examination of the commuting patterns associated with the site to be undertaken.

With the information gathered, a strategy to promote sustainable travel decisions for the site will be devised. It is envisaged that occupants of the site will derive the following benefits: -

- Healthier commute to work for residents.
- More informed travel options for residents and visitors.
- A reduction in the demand for parking spaces (and as a consequence reduce parking practices).
- Improved environmental performance.
- On-going liaison with Fingal County Council and public transport providers to maintain, improve and support transportation services to and from the site.
- Promotion of social networks within the development.
- Reduced congestion around the site.
- Cheaper commutes for residents.

Influencing Travel Patterns

In order to give the strategy a good founding it will be necessary to fully understand the nature of the trip patterns associated with the Operational Phase of the Proposed Development. In order to achieve this, trip movements to and from the site must be examined and assessed for potential future influence.

Table 13.22 below lists the likely nature and extent of anticipated traffic movements to and from the Proposed Development. It also highlights those trips where change is most possible to influence.

Nature of Traffic Movements to Residential Development	Increasing with Development	Possible to Influence?
Residents commuting to and from work	Yes	Yes
Leisure Related Journeys	Yes	Yes, but more difficult
Deliveries	Yes	Yes, but more difficult
Members of the Public/Visitors	Yes	Difficult and impractical

Table 18.1: Nature of traffic movements & ability to influence.

As visitor journeys are difficult to predict and influence, this mobility management plan will focus on commuting journeys for residents. As commuting journeys are by their very nature regular and predictable i.e., they generally happen in the same period every morning and every evening, they will form the focus of the Mobility Management Plan.

The setting of realistic and achievable modal split targets is vital if all or any of the measures are to be successful. The targets need to be attainable and most importantly correspond with the development's goals i.e. deliver the benefits listed above.

Accessibility Audit

Section 13.3 provides a summary of the receiving environment, by way of the existing and proposed public transport services in the vicinity of the development. The section also looks at the existing road infrastructure and facilities and contains a summary of the existing and proposed facilities for pedestrians and cyclists.

In summary, the principle of providing sustainable transport which is embodied in the Portmarnock South Local Area Plan will be given physical expression in the Proposed Development. The form and structure of the Proposed Development will encourage the use of public transport, cycling and walking in preference to the private car.

Action Plan

Commuter journeys by their very nature usually occur between the same two points (eg home and work) and at regular times. The successful implementation of the mobility management plan will provide the development with a number of advantages, which include: -

- Improved environmental performance.
- Improved social networks between residents.
- Improved health and well-being for those staff using active transport modes.
- Reduced demand for car parking spaces.

The following details the available initiatives to reduce the environmental impact of commuter journeys.

Car Pooling Scheme

While use of the car will be essential for a proportion of residents, car sharing schemes have the potential to deliver a significant reduction in private vehicle trips by promoting more residents to travel in each vehicle, thereby lowering single occupancy vehicle (SOV) trips to the site.

A car pooling scheme relies on a database to match residents, using information about their work addresses, their working hours, their preferences such as gender/driver or passenger and their preferred route to and from work. Depending on the desired level of on-going Management Company / Residents Association input, a number of database options exist, some examples include: -

- Message boards (either paper, electronic or web-based).
- Manually administered system championed by an individual, who's function is to match individuals interested in car sharing.
- Websites that have automated functions to match people and provide contact details.
- Websites that have automated functions to match people and provides a message service to potential matches.
- Dedicated phone line systems in cases where people are unlikely to have internet access.

The most successful car sharing schemes rely on strong promotion, are internet based and use an operator to contact members on a regular basis to inform them of potential lifts.

A number of car sharing initiatives have been launched recently in Dublin, including the "Gocar" pay-as-you-drive scheme which allows subscribed members to share in the use of a pool of vehicles by reserving a time allocation online in advance and "carsharing.ie", a car pooling service that facilitates people looking to trip share. The local centre, which is included in the Phase 1C development currently under construction, can be used to help promote these initiatives when completed.

Walking

It is proposed to provide a network of footpaths that will permeate the residential area and provide a high degree of accessibility to local facilities and to bus and rail transport. Initiatives such as the development of a support forum whereby any localised problems can be discussed, with the aim of pursuing corrective action from the local authority may encourage walking amongst residents.

On the basis that 30 mins is considered an acceptable walking distance, residents can walk to an area that includes Portmarnock Village, Baldoyle and Clongriffin.

Refer to Figure 13.19 following for illustration of 30min walking cordon.

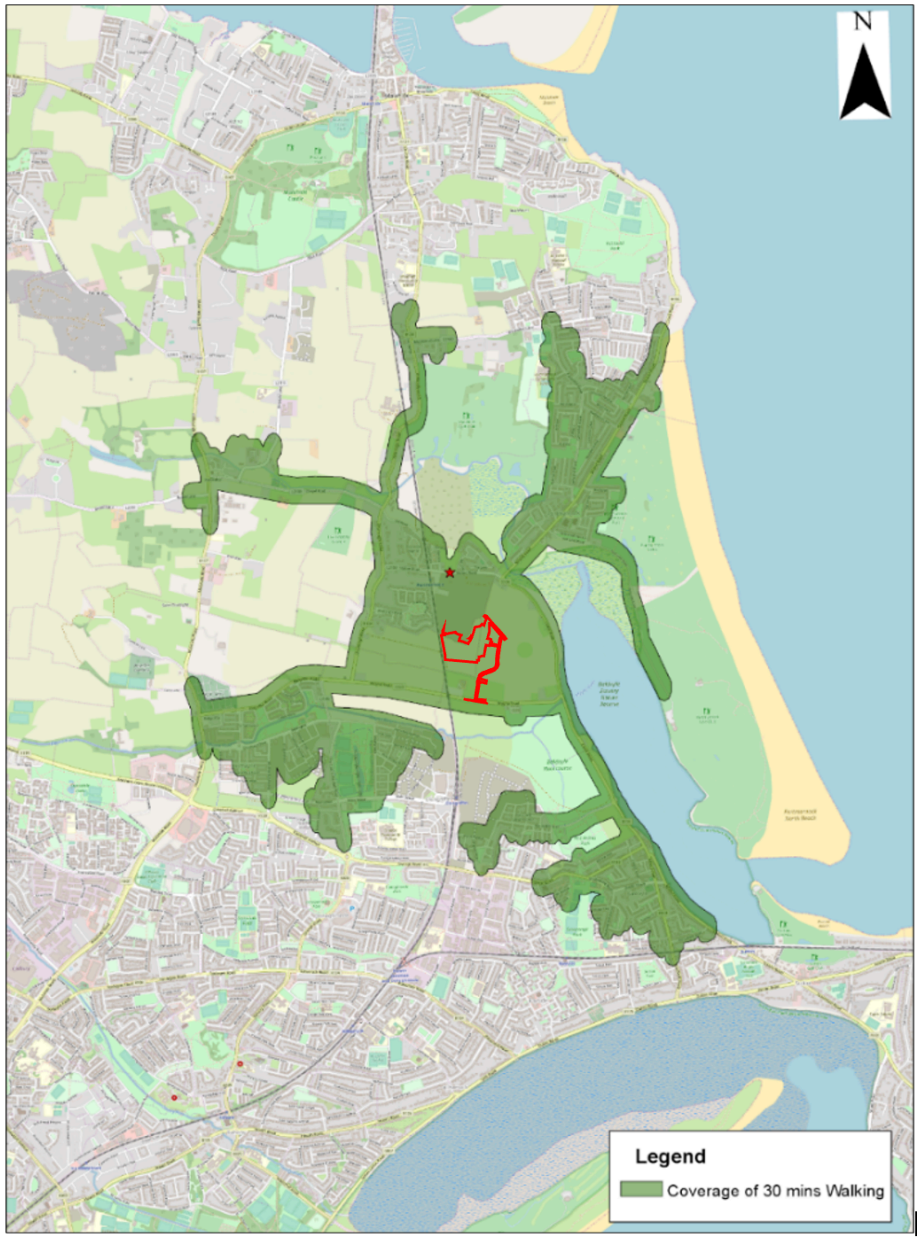

Figure 13.1: 30 min Walking Cordon from the Proposed Development / Portmarnock Local Area Plan lands.

Cycling

A number of segregated combined cycle and footpath routes through the development and a circular cycle/footpath route will connect homes to the DART station, commercial area and open space. For commuter journeys, cycling is a feasible mode of transport for those working within 30 mins of the site. Cyclists could therefore be expected to travel to an area encompassed by Clontarf, Howth, Malahide and Beaumont. Greater distances such as to the city centre, could be expected from cycle enthusiasts and regular cyclists.

Refer to Figure 13.20 following for illustration of 30 min cycling cordon.

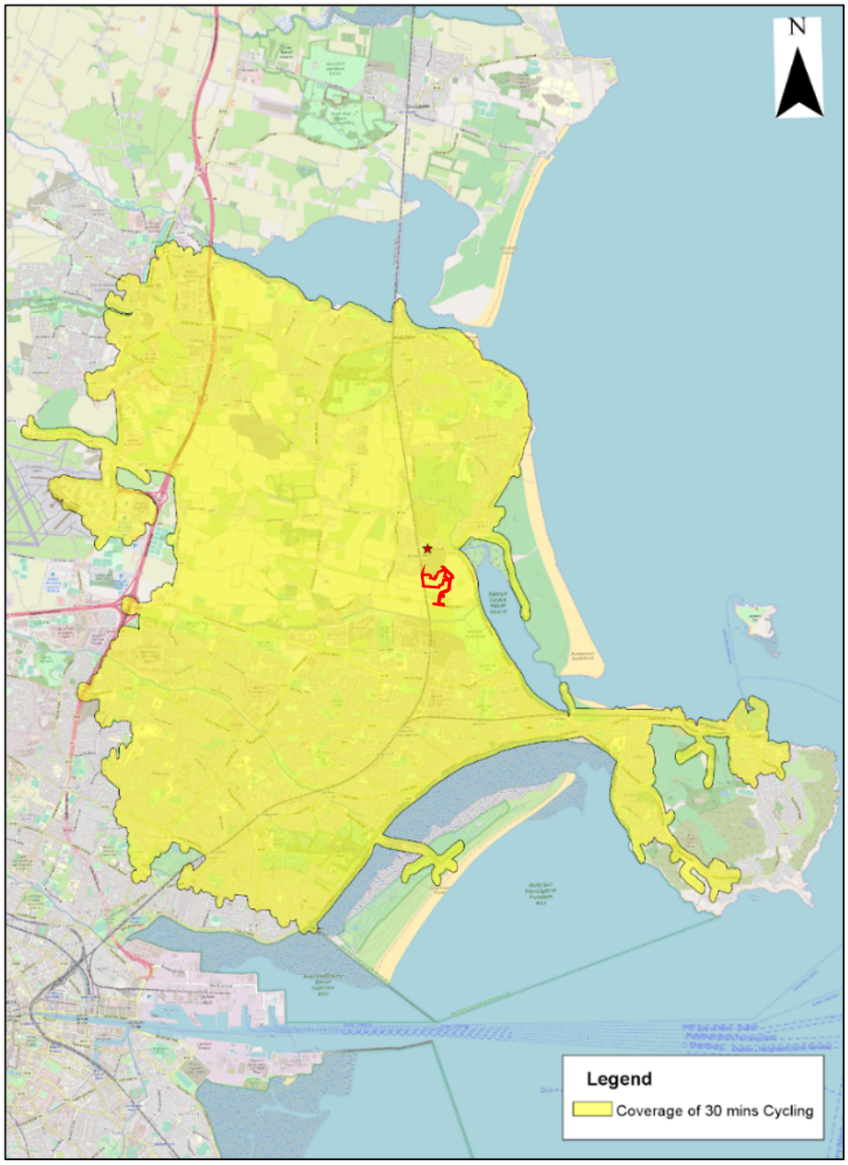

Figure 13.20: 30min Cycling Cordon from the Proposed Development / Portmarnock Local Area Plan lands.

The Government led initiative "Bike to Work" scheme allows employers to purchase a bicycle and safety equipment up to the value of €1,500. Employees can then use a salary sacrifice to pay for the bike, allowing them to save up to 52% on the retail price of the bike and safety equipment. Employers benefit by PRSI savings of 10.75%, as well as a reduced parking demand, a fitter and healthier workforce and improved environmental image.

Public Transport

The residential development and surrounding lands are currently well serviced by public transport between the Dart and Dublin Bus routes. To encourage patronage within the development for public transport the following measures could be set in motion: -

- Generate a site-specific leaflet showing all public transport routes;
- Promotion of a more environmentally friendly way to travel to work.
- Encourage Dublin Bus/Irish Rail to provide better public transport services to the site as demand grows.

Monitoring

Details on how best to implement and monitor the MMP is outlined in Section 13.8.1.3.

Cumulative Development

Construction Phase

The mitigation measures utilised for the Proposed Development (Phase 1D) will also be used in all future phases going forward. The construction management plan and traffic management plan to be submitted to FCC for approval will constantly be updated for future phases. It will set out requirements and standards which must be met during the Construction Phase and will include the relevant mitigation measures outlined in the EIAR and any subsequent conditions relevant to the Proposed Development. The document will include lessons learned from the previous phases.

Operational Phase

As per Section 13.6.2.1.

Additionally, the mobility management plan is not a one-off event, more so it is an on-going iterative process. The plan will constantly be updated and find new ways to reduce the developments' reliability on private cars.

18.2.11 Material Assets (Waste) (Chapter 14)

Proposed Development

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.

Construction Phase

The following mitigation measures will be implemented during the Construction Phases of the Proposed Development: -

- As previously stated, a project specific C&D WMP has been prepared in line with the requirements of the requirements of the Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects (DoEHLG, 2006), and is included as Appendix 14.1.

  Adherence to the high-level strategy presented in this C&D WMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the demolition, excavation and Construction Phases of the Proposed Development.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the C&D WMP (Appendix 14.1) in agreement with FCC, or submit an addendum to the C&D WMP to FCC, 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 be required to fully implement the C&D WMP throughout the duration of the proposed Construction and Demolition Phases.

A quantity of topsoil, sub soil and clay which will need to be excavated to facilitate the Proposed Development. Project Engineers have estimated that c. 23,663 m^3 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 with an aim 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.
    - 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 Waste Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the demolition, 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.
- 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. However, it is not currently anticipated that Article 27 will be used.

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, and the EMR Waste Management Plan 2015 – 2021. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

Operational Phase

As previously stated, a project specific OWMP has been prepared and is included as Appendix 14.2.

The residents of the development during the Operational Phase will be responsible for ensuring a high level of recycling, reuse and recovery in their individual units in accordance with the FCC waste-byelaws.

In addition, the following mitigation measures will be implemented: -

- The residents 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.
    - Glass.
    - Waste electrical and electronic equipment (WEEE).
    - Batteries (non-hazardous and hazardous).
    - Cooking oil.
    - Light bulbs.
    - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.).
    - Furniture (and from time to time other bulky waste).
    - Abandoned bicycles.
- The residents will ensure that all waste materials will be stored in colour coded bins or other suitable receptacles. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials.
- The residents 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.
- The residents 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 FCC Waste Management (Segregation, Storage and Presentation of Household and Commercial Waste) Bye-Laws 2020. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

Cumulative

Construction Phase

Multiple permissions remain in place for both residential and commercial developments within the vicinity of the development and it is likely more will occur in the Portmarnock area. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the Construction Phase. Due to the high number of waste contractors in the Fingal region there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

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

Operational Phase

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

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

18.2.12 Material Assets (Utilities) (Chapter 15)

Proposed Development

Construction Phase

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

- A detailed Construction & Environmental Management Plan will be developed and implemented during the Construction Phase.
- The construction compound will include adequate staff welfare facilities including power and potable water supply.
- The construction compound's potable water supply shall be protected from contamination by any construction activities or materials.
- All watermains to be constructed, pressure tested, cleaned and sterilised before being connected to existing operational water infrastructure in accordance with Section 4 of Irish Water's *Code of Practice for Water Infrastructure July 2020*.
- Method statements will be produced by the Contractor for submission to Irish Water prior to commencing any work in the vicinity of the 450mm DI Watermain.
- 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.
- Connections to the existing gas and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.

Operational Phase

On completion of the Construction Phase no further mitigation measures are proposed in relation to the electrical, telecommunications or broadband infrastructure.

18.2.13 Cultural Heritage (Archaeological & Architectural) (Chapter 16)

Proposed Development

Construction Phase

All archaeological mitigation measures identified within the SHD baseline report (CDHC 2021) for this project in order to gain a better understanding and certainty of the archaeological potential lands of the Phase 1D lands namely a geophysical survey and excavation of two 10m sections of townland boundaries to be impacted by the Proposed Development have taken place. The results of these surveys and excavations are discussed within this report (sections 16.3.3-16.3.4) and no features of an archaeological significance were identified.

Archaeological monitoring will take place of any works requiring ground disturbance / excavation, including site preparation works and temporary works where required. Should archaeological material be identified and subject to approval from the statutory authorities, the remains will be preserved by record through archaeological excavation. All findings will be submitted to the National Monuments Service (NMS) of the DHLGH and the National Museum of Ireland.

The developer, Quintain Developments Ireland Ltd is aware of their responsibility to fund all necessary archaeological work. All recommendations are subject to approval by the NMS of the DHLGH and the Heritage Officer from Fingal County Council.

Operational Phase

No mitigation measures are required during the Operational Phase of the Proposed Development.

Cumulative

Construction Phase

No cumulative mitigation measures were identified in relation Phase 1D during the Construction Phase.

Operational Phase

No cumulative mitigation measures were identified in relation Phase 1D during the Operational Phase.

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

Rating of Major Accidents and Disasters Without Mitigation

Construction Phase

The mitigation measures relevant to each environmental factor outlined in chapters 5 – 17 of the EIAR, as well as the CEMP, will be implemented during the Construction Phase of the development and will collectively mitigate the risk of major accidents and disasters during this time.

The Construction Phase of the Proposed Development will be carried out in accordance with best practice site management measures relating to health and safety and emergency response. These measures are described in the CEMP.

Operational Phase

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