

## **Chapter 16**

### **Summary of EIAR Mitigation and Monitoring Measures**

## 16.0 SUMMARY OF EIAR MITIGATION & MONITORING MEASURES

### 16.1 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.”

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.

### 16.2 MITIGATION STRATEGIES

#### 16.2.1 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).

#### 16.2.2 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.

#### 16.2.3 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.

#### **16.2.4 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.

#### **16.2.5 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).

#### **16.2.6 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.

### **16.3 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.

#### **16.3.1 Project Description & Alternatives Examined**

Having regard to the details of the construction stage of development, as described above, the following mitigation measures are considered relevant to Chapter 2- Project Description and Alternatives. Each individual chapter deals with specific aspects of the proposed development and includes mitigation and monitoring measures where considered appropriate.

##### **Construction Phase**

The Construction and Environmental Management Plan, which the building contractor will be contractually obliged to implement, 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.

A Construction Waste Management Plan and Operational Waste Management Plan have been prepared in respect of the proposed development by DBFL 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.

#### **16.3.2 Population and Human Health**

##### **Construction Phase**

The mitigation measures relating to construction phase referenced in Chapter 2, Chapter 8 and Chapter 9 are also relevant to Chapter 3 and therefore will not be repeated herein.

### **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.

### **16.3.3 Archaeology and Cultural Heritage**

#### **Mitigation Measures**

Topsoil stripping associated with the proposed development will be monitored by a suitably qualified archaeologist, which will ensure the identification of any small archaeological features that may survive within the site. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation will be required, such as preservation in-situ or by record. Any further mitigation will require approval from the National Monuments Service of the Department of Housing, Local Government and Heritage (DoH/LGH).

#### **Monitoring**

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

### **16.3.4 Biodiversity**

#### **Mitigation Measures**

Construction and operational Mitigation Measures will be incorporated into the proposed development project to minimise the potential negative impacts on the ecology within the Zone of Influence (ZoI) including the onsite drainage ditch, Mill Stream (Skerries\_10) and Skerries Islands SPA.

#### *Designated Conservation sites within 15km*

The proposed development is not within a designated conservation site. A potential pathway exists via surface water to the nearby Natura 2000 site (Skerries Islands SPA). The potential impacts on Natura 2000 sites are seen in Table 5.7. The construction works could lead to the transportation of silt and pollutants “downstream” to the Skerries Islands SPA via the drainage ditch on site and via the Mill Stream which connects to the culvert under the railway embankment. Construction phase mitigation measures are required on site particularly as significant reprofiling of the site is proposed which will remove all existing terrestrial habitats and can lead to silt laden and contaminated runoff. In addition, there is an existing drainage ditch that runs west to east across the northern boundary of the development site which will be impacted by the development of the site. There is potential for silt laden runoff and contamination to enter the watercourse with potential for downstream impacts. Mitigation measures are required to prevent downstream impacts. In addition, noise mitigation will be in place. These mitigation measures are described in Table 5.6 and illustrated in Figure 5.8.

#### *Ecology*

The impact of the development during construction phase will be a loss of existing habitats and species. During the site visit no flora, bird or terrestrial mammal species of conservation importance were recorded on site or in NPWS or NBDC records. However, spawn from the common frog (*Rana temporaria*) was noted in the wet grassland beside the drainage ditch, bordering the northern extent of the site. Trees and hedgerows will be removed to facilitate development. This will result in a loss of nesting and feeding resource for birds on site in addition to one tree of bat roosting potential. Additional planting will be carried out during the landscaping stage

Small mammals such as long-tailed field mouse, house mouse, brown rat are likely to be present. No evidence of mammal activity or badger setts were noted. Foxes are present on site. Frogs and reptiles were not observed on site; however, given the presence of an existing onsite drainage ditch and frogs spawn frogs are present on site. The common lizard may occur on site but was not observed. Some mortality may occur of species that are not of conservation significance during construction. Mitigation measures are required to protect the biodiversity on site and downstream from the proposed works impacts. These are described in Table 16.1.

**Table 16.1.** Sensitive Receptors/Impacts and mitigation measures.

Sensitive Receptors	Designed-in Mitigation
<p>Skerries Islands SPA Qualifying Interests (Cormorant (<i>Phalacrocorax carbo</i>) [A017] Shag (<i>Phalacrocorax aristotelis</i>) [A018] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Purple Sandpiper (<i>Calidris maritima</i>) [A148] Turnstone (<i>Arenaria interpres</i>) [A169] Herring Gull (<i>Larus argentatus</i>) [A184])</p> <p>Watercourses Aquatic flora Fauna</p>	<p>Given the nature of the works, adjacent to an onsite drainage ditch and Mill Stream (Skerries_10), all of these effects would be expected to be localised in nature restricted to the immediate vicinity of the site. However, without the presence of mitigation measures there is a potential for downstream effects if significant quantities of pollution or silt were introduced into the onsite drainage ditches and Mill Stream (Skerries_10) with potential for downstream impacts on Skerries Islands SPA.</p> <p>The storage of topsoil or works in the vicinity of the drainage ditch on onsite could lead to dust, soil or silt laden runoff entering adjacent watercourses and drainage ditches. Contaminated surface water runoff on site during construction or operation may lead to silt or contaminated materials from site entering the onsite ditch and Mill Stream (Skerries_10) with downstream impacts on the SPA. If on-site concrete production is required or cement works are carried out in the vicinity of watercourses/drainage ditches there is potential for contamination of watercourses. The use of plant and machinery, as well as the associated temporary storage of construction materials, oils, fuels and chemicals could lead to pollution on site or in adjacent watercourses.</p> <p><b>Construction Mitigation</b></p> <ul style="list-style-type: none"> <li>• All works methodologies will have prior approval of a project ecologist. The project ecologist will have experience with instream works.</li> <li>• Best available technology (BAT) mitigation measures designed by project ecologist</li> <li>• Staging of project will be carried out to reduce risks to drainage ditches from contamination</li> <li>• Local drainage ditches and watercourses must be protected from dust, silt and surface water throughout the works.</li> <li>• Local silt traps established throughout site.</li> <li>• Mitigation measures on site include dust control, stockpiling away from drains</li> <li>• The project ecologist will be present for the culvert installation to ensure that sufficient measures will be in place.</li> <li>• Stockpiling of loose materials will be kept to a minimum of 20m from watercourses and drains.</li> <li>• Stockpiles and runoff areas following clearance will have suitable barriers to prevent runoff of fines into the drainage system and watercourses.</li> <li>• Fuel, oil and chemical storage will be sited within a bunded area. The bund will be at least 50m away from drains, ditches or the watercourse, excavations and other locations where it may cause pollution.</li> </ul>

Sensitive Receptors	Designed-in Mitigation
	<ul style="list-style-type: none"> <li>• Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. Any water-filled excavations, including the attenuation tank during construction, that require pumping will not directly discharge to the stream. Prior to discharge of water from excavations adequate filtration will be provided to ensure no deterioration of water quality.</li> <li>• The excavation of the 10m buffer surrounding the drainage ditch should be carried out in dry weather with no runoff entering the drainage ditch.</li> <li>• Mitigation measures on site include dust control, stockpiling away from watercourses and drains</li> <li>• Pollution control and mitigation on site</li> <li>• Stockpiles and runoff areas following clearance will have suitable barriers to prevent runoff of fines into the drainage system and watercourses.</li> <li>• Fuel, oil and chemical storage will be sited within a bunded area. A risk based approach will be taken.</li> <li>• Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination.</li> <li>• During the construction works silt traps will be put in place in the vicinity of all runoff channels the stream to prevent sediment entering the drainage ditch.</li> <li>• Petrochemical interception and bunds in refuelling area</li> <li>• Planting in the vicinity of the crossing should be put in place as soon as possible to allow biodiversity corridors to establish.</li> <li>• On-site inspections to be carried out by project ecologist.</li> <li>• Maintenance of any drainage structures (e.g. de-silting operations) must not result in the release of contaminated water to the surface water network.</li> <li>• No entry of solids to the associated stream or drainage network during the connection of pipework</li> <li>• Landscaping of the Riparian corridor will be carried out to the satisfaction of ecologist at an early stage of the project.</li> <li>• Full compliance with the water Pollution Acts will be carried out on site.</li> <li>• Silt traps established throughout site including a double silt fence between the site and the watercourse.</li> <li>• Sufficient onsite cleaning of vehicles prior to leaving the site and on nearby roads, will be carried out, particularly during groundworks.</li> <li>• The Site Manager will be responsible for the pollution prevention programme and will ensure that at least daily checks are carried out to ensure compliance. A record of these checks will be maintained.</li> <li>• The site compound will include a dedicated bund for the storage of dangerous substances including fuels, oils etc. Refuelling of vehicles/machinery will only be carried out within the bunded area.</li> <li>• A project ecologist will be appointed and consulted in relation to all onsite drainage during construction works. Consultation with the project ecologist will not involve the formulation of new mitigation measures for the purposes of protecting any European Site, and</li> </ul>

Sensitive Receptors	Designed-in Mitigation
	<p>relate only to the implementation of those mitigation measures already stated in the submission or the formulation of mitigation for other purposes.</p> <ul style="list-style-type: none"> <li>• Dewatering of excavations may be necessary. Appropriate monitoring of groundwater levels during site works will be undertaken. Standard construction phase filtering of surface water for suspended solids will be carried out. Unfiltered surface water discharges or runoff are not permitted from the site into the onsite watercourse during the works. Trenched double silt fencing shall be put in place along boundary of the proposed development site with 10m buffer from the onsite drainage ditch. This fencing must be in place as one of the first stages on site and prior to the full site clearance. The silt fencing will act as a temporary sediment control device to protect the watercourse from sediment and potential site water runoff. The fencing will be inspected twice daily, based on site and weather conditions, for any signs of contamination or excessive silt deposits.</li> <li>• Concrete trucks, cement mixers or drums/bins are only permitted to wash out in designated wash out area greater than 50m from sensitive receptors including drains and drainage ditches.</li> <li>• Abstraction of water from watercourses will not be permitted.</li> <li>• Spill containment equipment shall be available for use in the event of an emergency. The spill containment equipment shall be replenished if used and shall be checked on a scheduled basis.</li> <li>• All site personnel will be trained in the importance of good environmental practices including reporting to the site manager when pollution, or the potential for pollution, is suspected. All persons working on-site will receive work specific induction in relation to surface water management and run off controls. Daily environmental toolbox talks / briefing sessions will be conducted to outline the relevant environmental control measures and to identify any environment risk areas/works.</li> <li>• Environmental risks due to construction and operation of the proposed development do potentially exist, particularly in relation runoff from sloping site, drains that could lead to the onsite watercourse. Ecological supervision will be required during diversion, excavation and enabling works stages. Silt interception measures will need to be in place to ensure that the watercourses are not impacted during works and in particular during the site clearance, in-stream works and reprofiling stages. Landscaping of the grassed areas of the site proximate to the onsite watercourse should take place immediately following re-profiling, to act as a buffer to protect the drainage ditch.</li> </ul> <p><i>Air &amp; Dust</i></p> <p>Dust may enter the onsite drainage ditch via air or surface water with potential downstream impacts. Mitigation measures will be carried out reduce dust emissions to a level that avoids the possibility of adverse effects on the onsite watercourse. The main activities that may give rise to dust emissions during construction include the following:</p> <ul style="list-style-type: none"> <li>• Excavation of material;</li> </ul>



Sensitive Receptors	Designed-in Mitigation
	<ul style="list-style-type: none"> <li>• Materials handling and storage;</li> <li>• Movement of vehicles (particularly HGV's) and mobile plant.</li> <li>• Contaminated surface runoff</li> </ul> <p><i>Mitigation measures to be in place:</i></p> <ul style="list-style-type: none"> <li>• Consultation will be carried with an ecologist throughout the construction phase;</li> <li>• Trucks leaving the site with excavated material (if required) will be covered so as to avoid dust emissions along the haulage routes.</li> <li>• Speed limits on site (15kmh) to reduce dust generation and mobilisation.</li> <li>• The drainage ditch is to be protected from dust on site. This may require additional measures in the vicinity of the building during demolition e.g. placing of terram/protective material over the stream.</li> </ul> <p><i>Site Management</i></p> <ul style="list-style-type: none"> <li>• Regular inspections of the site and boundary should be carried out to monitor dust, records and notes on these inspections should be logged.</li> <li>• Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.</li> <li>• Make the complaints log available to the local authority when asked.</li> <li>• Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.</li> </ul> <p><i>Monitoring</i></p> <ul style="list-style-type: none"> <li>• Undertake daily on-site and off-site inspection, where receptors are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces within 100 m of site boundary, integrity of the silt control measures, with cleaning and / or repair to be provided if necessary.</li> </ul> <p><i>Preparing and Maintaining the Site</i></p> <ul style="list-style-type: none"> <li>• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.</li> <li>• Fully enclose specific operations where there is a high potential for dust production and the site is active for an extensive period.</li> <li>• Avoid site runoff of water or mud.</li> </ul>

Sensitive Receptors	Designed-in Mitigation
	<ul style="list-style-type: none"> <li>• Keep site fencing, barriers and scaffolding clean using wet methods.</li> <li>• Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.</li> <li>• Cover, seed or fence stockpiles to prevent wind whipping.</li> <li>• 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.</li> <li>• Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions.</li> <li>• Maintain a vegetated strip and vehicle exclusion zone between the works and the onsite watercourse in consultation with the project ecologist.</li> </ul> <p><i>Operations</i></p> <ul style="list-style-type: none"> <li>• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.</li> <li>• Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.</li> <li>• Use enclosed chutes and conveyors and covered skips.</li> <li>• Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.</li> <li>• Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.</li> </ul> <p><i>Measures Specific to Earthworks</i></p> <ul style="list-style-type: none"> <li>• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.</li> <li>• Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.</li> <li>• Only remove the cover in small areas during work and not all at once.</li> <li>• During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.</li> <li>• The Contractor will be required to consult with an ecologist prior to the beginning of works to identify any additional measures that may be appropriate and/or required.</li> </ul>

Sensitive Receptors	Designed-in Mitigation
	<p><i>Storage/Use of Materials, Plant &amp; Equipment</i></p> <ul style="list-style-type: none"> <li>• Materials, plant and equipment shall be stored in the proposed site compound location;</li> <li>• Plant and equipment will not be parked within 50m of the onsite watercourse at the end of the working day;</li> <li>• Hazardous liquid materials or materials with potential to generate run-off shall not be stored within 50m of the onsite watercourse.</li> <li>• All oils, fuels and other hazardous liquid materials shall be clearly labelled and stored in an upright position in an enclosed bunded area within the proposed development site compound. The capacity of the bunded area shall conform with EPA Guidelines – hold 110% of the contents or 110% of the largest container whichever is greater;</li> <li>• Fuel may be stored in the designated bunded area or in fuel bowsers located in the proposed compound location. Fuel bowsers shall be double skinned and equipped with certificates of conformity or integrity tested, in good condition and have no signs of leaks or spillages;</li> <li>• Smaller quantities of fuel may be carried/stored in clearly labelled metal Jeri cans. Green for diesel and red for petrol and mixes. The Jeri cans shall be in good condition and have secure lockable lids. The Jeri cans shall be stored in a drip tray when not in use. They will not be stored within 50m of the onsite watercourse;</li> <li>• Drip trays will be turned upside down if not in use to prevent the collection of rainwater;</li> <li>• Waters collected in drip trays must be assessed prior to discharge. If classified as contaminated, they shall be disposed by a permitted waste contractor in accordance with current waste management legal and regulatory requirements;</li> <li>• Plant and equipment to be used during works, will be in good working order, fit for purpose, regularly serviced/maintained and have no evidence of leaks or drips;</li> <li>• No plant used shall cause a public nuisance due to fumes, noise, and leakage or by causing an obstruction;</li> <li>• Re-fuelling of machinery, plant or equipment will be carried out in the site compound as per the appointed Construction Contractor re-fuelling controls;</li> <li>• All persons working will receive work specific induction in relation to material storage arrangements and actions to be taken in the event of an accidental spillage. Daily environmental toolbox talks / briefing sessions will be conducted for all persons working to outline the relevant environmental control measures and to identify any environment risk areas/works.</li> </ul> <p><b>Noise and Vibration</b></p> <p>As outlined in the Noise and Vibration Chapter of the EIAR (Chapter 10) the following mitigation will be in place:  <i>“The following noise and vibration management measures shall apply to the proposed project to ensure that the threshold value for noise and vibration (as applied to buildings) are complied with:</i></p>

Sensitive Receptors	Designed-in Mitigation
	<ul style="list-style-type: none"> <li>• <i>A Site Representative shall be appointed for matters related to noise and vibration.</i></li> <li>• <i>Any complaints received shall be thoroughly investigated.</i></li> <li>• <i>A written complaints log shall be maintained by the Site Representative. This shall, at a minimum, record complainant's details (where agreed) the date and time of the complaint, details of the complaint including where the effect was observed, corrective and preventative actions taken and any close-out communications. This will ensure that the concerns of local residents who may be affected by site activities are considered during the management of activities at the site.</i></li> <li>• <i>Noise monitoring with capability for real-time review both on-site and remotely by Project Management shall be conducted at nearby NSRs throughout. Monitoring will be conducted at NSR1 and 3 at a minimum. As development moves south, monitoring shall be conducted at NSRs 2 and 5.</i></li> <li>• <i>In the event of exceedance of the limits at NSRs, works shall be ceased and measures implemented immediately to ensure that the limits are complied with and/or duration in minimised.</i></li> <li>• <i>Noise monitoring with capability for real-time review will facilitate immediate mitigation at nearby NSRs especially when noisy activities are planned.</i></li> <li>• <i>Due to the proximity of separate development sites, and where works are occurring in tandem, individual Site Representatives or their appointed noise and vibration representatives will be required to liaise on management of construction noise impact through real-time review of monitoring data to ensure that the limits are met cumulatively.</i></li> <li>• <i>Temporary acoustic screening shall be placed along the boundaries with NSRs where works take place close to the boundary. As a general rule of thumb, it is recommended that temporary screening break the "line of sight" from the sources to the affected windows of the nearest NSRs where possible. It is likely that screening will be required at NSR1 throughout the duration of the proposed works.</i></li> <li>• <i>The screening should be of sufficient surface density (minimum 10 kg/m<sup>2</sup>) to mitigate temporary noise impact associated with the construction phase.</i></li> <li>• <i>The operation of certain pieces of equipment, where substitution etc cannot be carried out shall be managed through monitoring and timing of use to ensure that the threshold values/criteria specified are complied with.</i></li> <li>• <i>During the construction phase all equipment shall be required to comply with noise limits set out in EC Directive 2000/14/EC as amended by Directive 2005/88/EC on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors. The directive covers equipment such as compressors, welding generators, excavators, dozers, loaders and dump trucks.</i></li> </ul>

Sensitive Receptors	Designed-in Mitigation
	<ul style="list-style-type: none"> <li>• <i>While piling is dictated by constraints such as ground conditions (although a worst-case scenario has been assessed in this chapter) the design and final method chosen shall ensure compliance with the threshold limits for noise and vibration as set out in this chapter and limits proposed by Irish Rail for the rail line.</i></li> <li>• <i>Measures such as use of an acoustic shroud, damping of the hammer impact and enclosure of the hammer shall be considered for reducing noise impact if applicable to the final piling design.</i></li> <li>• <i>At the time of tender, the contractor will be obliged to review all systems taking noise and vibration into account in the choice of equipment. As noted in BS5228-1, “the construction industry is generally innovative and constantly developing, and there may be proprietary systems available at the time of tender that were not known or available at the planning stage.”</i></li> <li>• <i>Vibration monitoring will be conducted when sources which potentially could cause vibration impact to buildings will be in use e.g. during piling at NSR5. In this regard, test monitoring will be conducted with the equipment on at low levels before increasing incrementally to operational levels if deemed necessary. Works will be ceased and mitigation measures implemented during the construction phase where monitoring detects vibration levels associated with the works above the relevant guidance values for building damage as set out in Section 10.5.1.2.”</i></li> </ul> <p><b>Operational Mitigation</b> Landscape and drainage (swale) works will be inspected by the project ecologist post construction. Silt and petrochemical measures will be in place on the surface water network.</p>
<p><b>Birds (National Protection)</b></p>	<ul style="list-style-type: none"> <li>• Compensatory hedgerows will be planted along the northern boundary to maintain and enhance a biodiversity corridor.</li> <li>• Relevant guidelines and legislation (Section 40 of the Wildlife Acts, 1976 to 2012) will be followed. Should the removal of potential nesting habitats outside of bird breeding season not be possible, a pre-works check by a qualified ecologist will be undertaken to ensure nesting birds are absent.</li> <li>• 30 Nest boxes will be placed on site to compensate for temporary resource loss. These will be located within the compensatory hedgerow.</li> </ul>

Sensitive Receptors	Designed-in Mitigation
	<ul style="list-style-type: none"> <li>Noise mitigation measures will be carried out as previously outlined in the Noise Chapter. Removal of potential nesting habitats will take place outside of bird breeding season (March to August inclusive). Should this not be possible, a pre-works check by a qualified ecologist will be undertaken to ensure nesting birds are absent.</li> <li>As outlined in the landscape plan the planting of the hedgerow will be with semi-mature trees to allow for the rapid establishment of the hedgerow and bird nesting resource.</li> </ul>
<b>Bats (international Protection)</b>	<ul style="list-style-type: none"> <li>Landscaping as outlined in the Landscape masterplan will provide unlit replacement foraging corridors for bat species within the drainage ditch buffer zone. Tree planting will be done in consultation with the onsite ecologist to reinstate foraging corridors.</li> <li>Lighting at all stages will be done sensitively on site with no direct lighting of hedgerows, treelines and drainage ditch, swale and buffer zone.</li> <li>6 bat boxes will be placed on site.</li> </ul>
<b>Hedgerows and Treelines (Local importance)</b>	<ul style="list-style-type: none"> <li>Landscaping will provide additional nesting and food resource for birds equivalent to that lost during site clearance.</li> <li>A semi mature hedgerow will be placed across the northern portion of the site above the swale to enhance the biodiversity corridor on site. This has been designed to guide biodiversity to the mammal passes under the road on site</li> </ul>
<b>Amphibians</b>	<ul style="list-style-type: none"> <li>Preconstruction amphibian survey by ecologist.</li> <li>Compensatory habitat within the drainage ditch/swale as a frog breeding area. This breeding area will be fenced off from the general public.</li> </ul>

## Monitoring

Monitoring of the project by a project ecologist will be undertaken to oversee the implementation of the surface water management on site, ensure that frogs on site are not impacted by the proposed works and that the landscaping strategy enhances and compensates for the loss of bat foraging areas on site.

### **16.3.6 Landscape and Visual Impact**

#### **Mitigation Measures**

##### Construction Phase

During construction the site and immediate environs would be heavily disturbed by construction activities and the incremental growth of the buildings on site, causing negative landscape effects of moderate significance and significant negative visual effects for some receptors (the houses nearest to the site).

Such impacts are an unavoidable consequence of development and there is limited potential for mitigation. Site hoarding would screen ground level activity, stockpiles, vehicles, etc. but once the buildings grow above ground floor level they would be visible above the hoarding, as would cranes, scaffolding and construction activity on the buildings themselves.

No landscape or visual-specific mitigation is recommended other than standard best practice construction site management, which should include the erection and maintenance of hoarding on the site boundaries.

##### Operation Phase

The potential landscape effects of the proposed development have been classified as being of moderate significance and positive (based on an analysis of the proposal against the relevant criteria in the Urban Design Manual – A Best Practice Guide (2009)).

The urban design criteria place considerable emphasis on a proposed developments' responsiveness (in layout, built form, architecture and landscape design) to the landscape context and sensitivities in the receiving environment. Such responsiveness is effectively 'embedded mitigation' in design. The analysis in Table 6.7 above shows that the proposed development responds appropriately and effectively to its context.

Only one negative potential visual effect has been identified. This is Viewpoint 3, which represents a house neighbouring the site. The house stands in a large open plot/garden and shares a 100m long boundary with the site (i.e. it is highly visually exposed to the site). Currently, due to its separation from the main urban area the landscape context of the house appears rural (although the landscape context is rather peri-urban, i.e. a combination of rural and urban-generated elements and characteristics, typical of the outskirts of a town) and the view from this property is over rolling agricultural fields (the current site condition).

The proposed development would see two duplex terraces (comprising Block B) located on the site side of the shared boundary. The landscape context of the property would be urbanised, and views from the property dramatically changed. Considering the current condition, the visual effects can only be classified as significant negative. This does not mean that the change is inappropriate. The following factors should be considered: (1) with most urban expansion/consolidation projects – particularly in peri-urban contexts where there might be a number of houses already existing in the expansion area - there are unavoidable impacts on those existing houses, due to the encroachment of new development into their immediate environment; (2) the site is zoned for residential development; (3) any development of sustainable density on the site would result in similar impacts on this highly exposed neighbouring property; (4) the design of Block B and the treatment of the shared boundary have sought to minimise the visual impact.

Therefore, while a negative effect on this neighbouring property is acknowledged, no further mitigation (other than the embedded mitigation in the design of the proposal) is recommended. Overall, the proposed development represents a considered an appropriate response to the landscape context and sensitivities.

#### **Monitoring**

No monitoring of landscape or visual effects is proposed.

### **16.3.7 Air Quality and Climate Noise & Vibration**

#### **Mitigation Measures**

A Dust Management Plan will be formulated for the construction phase of the project, as construction activities will generate some dust emissions as described above. The principal objective of the Plan is to ensure that dust emissions do not cause significant nuisance at receptors in the vicinity of the site. The most important features of the Dust Management Plan are presented in Section 11 of the Construction and Environmental Management Plan and are summarised below:

- Apply a speed limit of 20km/hr for on-site vehicles
- Provide water bowsers during periods of dry weather to ensure unpaved areas are kept moist.
- Spray exposed site haul roads during dry and / or windy weather.
- Ensure paved roads are kept clean and free of mud and other materials. Sweep hard surface roads, inside and outside the site, to ensure roads are kept clear of debris, soil or other material.
- Restrict un-surfaced roads to essential site traffic.
- Construction techniques shall minimise dust release into the air.
- Protect overburden material from exposure to wind by storing the material in sheltered regions of the site.
- Regular watering of stockpiles during dry and windy periods.
- Located any stockpiles away from sensitive receptors, (i.e. receptors sensitive to dust release).
- Provide tarpaulins over all unacceptable excavated materials being carted off site.
- The excavating machines will be cleaned on a daily basis to ensure no excess grease and dust is left on the machine.

The design of the construction programme and the location and layout of the construction compound and the storage of materials will be carefully planned to ensure that air quality impacts are minimised. Any contractors working on the subject site will be contractually obliged to ensure the following mitigation features will be employed in order to minimise emissions from the activity and the associated impacts of such emissions.

- Activities with potential for significant emissions will wherever possible be located at a position as far as possible removed from the nearest residential and commercial receptors;
- The construction compound area will have hard standing areas to minimize dust generation from windblow.
- A daily inspection programme will be formulated and implemented in order to ensure that dust control measures are inspected to verify effective operation and management.
- A dust deposition monitoring programme will be implemented at the site boundaries for the duration of the construction phase in order to verify the continued compliance with relevant standards and limits.

#### **Monitoring**

The Contractor will be required to produce an Air Quality and Dust Management Plan including Best Practice Measures to control dust and in particular, measures to prevent dust nuisance. The Contractor will be obliged to include and observe the measures specified in the Construction Environmental Management Plan. The principal objective of the Air Quality and Dust Management Plan will be to ensure that dust emissions do not cause significant nuisance at receptors near the Proposed Project. A dust deposition monitoring programme will be implemented during the Construction Phase in order to verify the continued compliance with relevant standards and limits.

### **16.3.8 Land and Soils**



## **Mitigation Measures**

### *Construction Phase*

Construction will result in land take of approximately 4.8 hectares of agricultural land and the design levels will tie in with the surround topography.

### *Stripping of Topsoil*

Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.

Topsoil stockpiles will be protected for the duration of the works and not located in areas where any sediment laden runoff may enter existing surface water drains.

*Topsoil stockpiles will also be located so as not to necessitate double handling.*

Surface water runoff from areas stripped of topsoil 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.

On-site settlement ponds will be installed and will include geotextile liners and riprapped inlets and outlets to prevent scour and erosion.

### *Excavation of Subsoil Layers*

Excavation of existing subsoil layers has been minimised by designing the proposed road and finished floor levels as close to the original topography as possible. Cut type earthworks operations will not be required to achieve designed site levels.

Disturbed subsoil layers will be stabilized as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). The duration that subsoil layers are exposed is to be minimised in order to mitigate against weather effects.

Similar to the 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).

### *Imported Fill*

As noted in section 8.5.1.3 above, importation of fill to site will be required.

No large or long-term stockpiles of fill material will be held on the site. At any time, the extent of fill material held on site will be limited to that needed in the immediate vicinity of the active work area.

Smaller stockpiles of fill, where required, will be suitably protected to ensure no sediment laden runoff enters existing surface water drains. Such stockpiles are to be located in order to avoid double handling.

### *Construction Traffic*

Plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site.

Vehicle wheel wash facilities will be installed in the vicinity of any site entrances and road sweeping implemented as necessary in order to maintain the road network in the immediate vicinity of the site.

Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods.

### *Accidental Spills and Leaks*

In order to mitigate against spillages contaminating underlying soils, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstanding area.

Refuelling and servicing of construction machinery will take place in a designated hardstanding area which will also be remote from any surface water inlets (when not possible to carry out such activities off site).

Oil, fuel etc. storage areas will be decommissioned on completion of the construction phase. Any remaining liquids will be removed from site by an appropriately authorised collector and disposed of at an appropriate authorised facility.

### *Geological Environment*

No mitigation measures are proposed in relation to the geological environment as they are not necessary. There are no geological heritage or designated sites within the proposed development boundary.

### Operational Phase

On completion of the construction phase no mitigation measures are proposed as there will be no likely significant effect on land, soils and geology.

### **Monitoring**

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

- Adherence to Outline Construction Management Plan.
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road formation level in advance of placing capping material, stability of excavations etc.).
- Inspection of fuel / oil storage areas.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill, protection of soils for removal from site from contamination).
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.)

No ongoing monitoring is proposed on completion of the construction phase.

### **16.3.9 Water**

#### **Mitigation Measures**

The following mitigation measures (Table 16.2 and Table 16.3) will be implemented to ensure all risks identified are appropriately mitigated.

#### Construction Activities

No.	Construction Activity	Attribute	Character of Potential Impact	Mitigation	Post Mitigation Impact
1.	Excavation Activities	Groundwater	<p>It is anticipated that the development site works will involve some excavation of soils/subsoils for the various aspects of the development including foundations, underground services and site drainage. Although the northwest corner of the site is mapped as extreme vulnerability, the vast majority of the site is mapped as high vulnerability. The depth of excavation is anticipated to be limited and therefore the reduced thickness of overburden will not significantly effect the vulnerability of the underlying groundwater in the event of a pollution event such as a fuel spillage during the construction works. In addition, no significant excavation operations are proposed in the northwestern region of the site further minimising risks to groundwater.</p>	<p>The limited depth of excavation activities, in particular in the northwestern region of the site, will minimise the risk of increasing groundwater vulnerability at the site. Appropriate groundwater protection/mitigation measures in relation to fuel storage and construction traffic are detailed in the following sections and will ensure the risk posed is low, temporary and neutral.</p>	<p><b>Imperceptible</b></p>

No.	Construction Activity	Attribute	Character of Potential Impact	Mitigation	Post Mitigation Impact
		Surface Water	<p>The removal of established vegetative cover and construction work activities (e.g. vehicle movements) could lead to the loss of large quantities of soil particles through uncontrolled sediment erosion and silty runoff to the northern boundary ditch which flows to the Irish Sea, particularly during periods of high rainfall. This runoff could cause pollution to surface waters through the generation of suspended solids.</p>	<p>Soil removal during the construction phase of the project will be an unavoidable consequence of the development and would apply for virtually any form of site development.</p> <p>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.</p> <p>To ensure that any surface water runoff from the construction activities is appropriately controlled and treated before discharging into the surface water network.</p> <p>Topsoil will be stored in an appropriate manner on site for the duration of the construction works and protected for re-use on completion of the main site works.</p>	<b>Imperceptible</b>
2	Fuel storage/usage on site	Groundwater Surface Water	<p>Accidental spillage of contaminants during construction works may cause short to long term, moderate to significant impacts to groundwater and surface water if not stored and used in an environmentally safe manner.</p>	<p>Waste fuels and materials will be stored in designated areas that are isolated from surface water drains or open waters (e.g. excavations). Skips will be closed or covered to prevent materials being blown or washed away and to reduce the likelihood of contaminated water leakage. Hazardous wastes such as waste oil,</p>	<b>Imperceptible</b>

No.	Construction Activity	Attribute	Character of Potential Impact	Mitigation	Post Mitigation Impact
	Construction Traffic		<p>There may be a risk of groundwater pollution from site traffic through the accidental release of oils, fuels and other contaminants from vehicles.</p>	<p>chemicals and preservatives, will be stored in sealed containers and kept separate from other waste materials while awaiting collection by a registered waste carrier. Fuelling, lubrication and storage areas and site offices will not be located within 25m of drainage ditches, surface waters or open excavations.</p> <p>All waste containers (including all ancillary equipment such as vent pipes and refuelling hoses) will be stored within a secondary containment system (e.g. a bund for static tanks or a drip tray for mobile stores and drums). The bunds will be capable of storing 110% of the tank capacity. Where more than one tank is stored, the bund must be capable of holding 110% of the largest tank of 25% of the aggregate capacity (whichever is greater). Drip trays used for drum storage must be capable of holding at least 25% of the drum capacity. Where more than one drum is stored the drip tray must be capable of holding 25% of the aggregate capacity of the drums stored.</p> <p>Regular monitoring of water levels within drip trays and bunds due to rainfall will be undertaken to ensure sufficient capacity is maintained at all times.</p>	

No.	Construction Activity	Attribute	Character of Potential Impact	Mitigation	Post Mitigation Impact
				<p>A bunded hardstanding area for refuelling will be constructed at the site. Surface water runoff from this concrete surface will discharge to a drain via a full retention petrol interceptor or to the on-site WWTP. Prior to the interceptor, a silt trap will be installed in order to remove the majority of suspended solids.</p> <p>The provision of wheel wash facilities close to the site entrance shall reduce the deposition of mud, soils and other substances on the surrounding road network.</p> <p>Oil which accumulates within the petrol interceptor shall be regularly removed by an appropriately licensed contractor. In addition, the petrol interceptor shall be appropriately maintained in accordance with the manufacturer's specification.</p> <p>Monitoring prior to, during and post construction works of surface water quality shall be undertaken to ensure minimum disturbance of water quality in the boundary ditch. No monitoring of the Mill Stream is deemed necessary as the site is not hydraulically connected with this water feature. During the construction phase, the monitoring programme will include daily checks, weekly inspections and monthly audits to ensure</p>	

No.	Construction Activity	Attribute	Character of Potential Impact	Mitigation	Post Mitigation Impact
				<p>compliance with the Construction Environmental Management Plan.</p> <p>Hazardous waste shall be dealt with in accordance with the Waste Management (Hazardous Waste) Regulations.</p> <p>An Emergency Operating Plan (EOP) to deal with the possibility of contamination or fuel spills, e.g., pumping of wells or sumps to collect contaminated groundwater or surface water for treatment will be developed and incorporated into an overall Construction &amp; Waste Management Plan (CWMP) for the development. The CIRIA document (2001) recommendations for developing a contingency plan for pollution emergencies will be implemented and include the following:</p> <ul style="list-style-type: none"> <li>• Containment measures.</li> <li>• Emergency discharge routes.</li> <li>• List of appropriate equipment and clean-up materials.</li> <li>• Maintenance schedule of equipment.</li> <li>• Details of trained staff.</li> <li>• Details of staff responsibilities.</li> <li>• Notification procedures to inform the relevant environmental protection authority.</li> <li>• Audit and review schedule; and,</li> <li>• List of specialist pollution clean-up companies and their telephone numbers.</li> </ul>	

No.	Construction Activity	Attribute	Character of Potential Impact	Mitigation	Post Mitigation Impact
				<p>Any vehicles utilised during the operational phase shall be maintained on a weekly basis and checked daily to ensure any damage or leakages are corrected. The potential impacts are limited by the size of the fuel tank of the largest plant / vehicles used on the site. Precautions shall be taken to avoid spillages. These include:</p> <ul style="list-style-type: none"> <li>• Use of secondary containment e.g. bunds around oil storage tanks;</li> <li>• Use of drip trays around mobile plant;</li> <li>• Supervising all deliveries and refuelling activities; and,</li> <li>• Designating and using specific impermeable refuelling areas isolated from surface water drains.</li> </ul> <p>The implementation of the above-described mitigation measures will ensure the risk posed by the identified potential impact will be low, temporary and neutral.</p>	
3.	Waste Arisings	Groundwater Surface Water	Waste material generated from construction activities may require disposal off-site. Temporary storage on site may be required and impacts to groundwater and surface water from possible contaminated direct runoff during rainfall events could potentially occur.	<p>Appropriate safe storage of all waste materials shall be implemented during the construction works in accordance with the Construction Waste Management Plan (CWMP) for the works. Measures include:</p> <ul style="list-style-type: none"> <li>• Covering of stockpiles to minimise surface water runoff,</li> <li>• Creation of berms around stockpiles to contain runoff during heavy rainfall events.</li> </ul>	<b>Imperceptible</b>



No.	Construction Activity	Attribute	Character of Potential Impact	Mitigation	Post Mitigation Impact
				<ul style="list-style-type: none"> <li>Waste segregation and storage in dedicated sealed skips</li> </ul> <p>The implementation of the above-described mitigation measures will ensure the risk posed by the identified potential impact will be low, temporary and neutral.</p>	
4.	Contaminated land / buried waste / waste soils	Groundwater Surface Water	No contaminated material or buried waste has been reported during the site investigation completed across the site. However, it is noted that no site investigation can be thorough enough to investigate every area of the site and therefore in the event of encountering unexpected ground contamination or buried waste material, it is anticipated to be very localised with an associated low level of risk posed to the environment	<p>Special environmental and human health contingency plans and procedures, following best-practice guidance, will be developed for the unexpected discovery of contaminated or illegally deposited waste materials.</p> <p>In the event of encountering contaminated ground or buried waste, an appropriately scoped contaminated land site investigation will be undertaken by a contaminated land consultant comprising soil monitoring, water monitoring, gas and vapour monitoring and groundwater level monitoring. All works will be undertaken in accordance with best practice and EPA Guidance On The Management Of Contaminated Land And Groundwater At EPA Licensed Sites, 2013.</p> <p>On completion of the above, a suitably detailed remediation program of works will be undertaken under the direction and supervision of a contaminated land consultant. The outcome of the investigation will dictate the most appropriate remedial solution for the development.</p>	<b>Imperceptible</b>

No.	Construction Activity	Attribute	Character of Potential Impact	Mitigation	Post Mitigation Impact
				<p>The implementation of the above-described mitigation measures will ensure the risk posed by the identified potential impact will be low, temporary and neutral.</p>	
5.	Vandalism	Groundwater Surface Water	<p>Pollution due to vandalism of stores or plant poses a risk to groundwater and to future site users.</p>	<p>Adequate security measures shall be installed on the construction site. Security measures will include secure fencing, secure site access, securing site plant and equipment, secure storage of materials and sufficient warning signage.</p> <p>The implementation of the above-described mitigation measures will ensure the risk posed by the identified potential impact will be low, temporary and neutral.</p>	<b>Imperceptible</b>
6.	Contaminated imported fill	Groundwater Surface Water	<p>The importation of unsuitable or contaminated fill material for the purpose of reinstatement works or access roads may pose a risk to the groundwater aquifer and surface waters in proximity to the site. 4,500 m<sup>3</sup> of imported fill to the site is expected.</p>	<p>All imported fill material shall be sourced from approved sources and appropriately certified and fit for purpose. All fill material will be confirmed to be inert prior to importation to the site including confirmation of the chemical testing and a visual assessment. Fill sourced from non-licensed/non-permitted facilities will require prior authorisation under Article 27 legislation.</p>	<b>Imperceptible</b>
8.	Increased risk of flooding and soil erosion	Surface Water	<p>The creation of hard standing areas (access roads) will be minimal as will the compaction of soil which increases the levels of surface water run-off resulting in flooding and/or soil erosion.</p>	<p>The risk of flooding on-site is very low based on the OPW flood maps.</p> <p>An appropriately designed site drainage system for the construction stage will be developed across the site to ensure that any surface water</p>	<b>Imperceptible</b>

No.	Construction Activity	Attribute	Character of Potential Impact	Mitigation	Post Mitigation Impact
				<p>runoff from the site is appropriately controlled and treated before discharging into the northern boundary land drain. Settlement ponds and will be established.</p> <p>Trenched double silt fencing shall be put in place along boundary of the proposed development site with 10m buffer from the onsite drainage ditch. This fencing shall be in place as one of the first stages on site and prior to the full site clearance. The silt fencing shall act as a temporary sediment control device to protect the watercourse from sediment and potential site water runoff. The fencing shall be inspected twice daily, based on site and weather conditions, for any signs of contamination or excessive silt deposits. Concrete trucks, cement mixers or drums/bins are only permitted to wash out in designated wash out area greater than 50m from sensitive receptors including drains and drainage ditches.</p> <p>Abstraction of water from watercourses will not be permitted.</p> <p>Water quality monitoring within the land drain will be undertaken by the contractor during the period of the construction phase of works. The monitoring will be undertaken on a daily, bimonthly, and monthly basis to ensure compliance with the 2009 Surface Water Regulations and with any conditions set by the planning authority. Daily monitoring will comprise visual and on-site monitoring (e.g. pH, Electrical Conductivity, Temperature and Total Dissolved Solids). Bimonthly monitoring will</p>	

No.	Construction Activity	Attribute	Character of Potential Impact	Mitigation	Post Mitigation Impact
				<p>involve samples collected for laboratory testing including Total Suspended Solids (TSS), Total Dissolved Solids (TDS), pH, Electrical Conductivity, Chloride and Ammoniacal Nitrogen. Monthly monitoring will include heavy metals, nitrate, nitrite, ORP and total hydrocarbons. Baseline monitoring of the land drain will be undertaken to determine the condition of the drain prior to commencement of the construction works. Any exceedances of baseline conditions attributed to the construction operations will be immediately assessed by the contractor and identification of the source of the impact identified to facilitate appropriate measures to prevent any further potential impacts.</p> <p>The implementation of the above-described mitigation measures will ensure the risk posed by the identified potential impact will be low, temporary and neutral.</p>	
9.	Construction stage dewatering	Surface Water	<p>Localised dewatering operations from trenches or excavations may be required during the construction works primarily relating to the build up of rainwater within excavations. Dewatering of the underlying bedrock aquifer is not anticipated. The discharge of sediment laden water to surface water has the potential to impact on surface water quality.</p>	<p>The temporary disposal and treatment of any water pumped from any excavations will be carefully managed.</p> <p>All waters from excavations will be passed through an on-site construction stage drainage system before being discharged to the local drain., along the northern site boundary.</p> <p>Construction phase filtering of surface water for suspended solids will be undertaken carried out. Untreated water discharges or runoff shall not be permitted from the site into the land drain.</p> <p>All waters abstracted from excavations will be monitored, as a minimum, on a daily, bimonthly, and monthly basis to ensure compliance with the 2009 Surface Water Regulations and with any</p>	<b>Imperceptible</b>

No.	Construction Activity	Attribute	Character of Potential Impact	Mitigation	Post Mitigation Impact
				<p>conditions set by the planning authority. Daily monitoring will comprise visual and on-site monitoring (e.g. pH, Electrical Conductivity, Temperature and Total Dissolved Solids). Bimonthly monitoring will involve samples collected for laboratory testing including Total Suspend Solids (TSS), Total Dissolved Solids (TDS), pH, Electrical Conductivity, Chloride and Ammoniacal Nitrogen. Monthly monitoring will include heavy metals, nitrate, nitrite, ORP and total hydrocarbons. Any exceedances of baseline conditions in the land drain or water quality disposed to the drain that is attributed to the construction operations will be immediately assessed by the contractor and identification of the source of the impact identified to facilitate appropriate measures to prevent any further potential impacts.</p> <p>The contractor will consult with the local authority to facilitate the application and granting of a temporary discharge licence.</p> <p>The implementation of the above-described mitigation measures will ensure the risk posed by the identified potential impact will be low, temporary and neutral.</p>	

**Table 16.2 Predicted Construction Phase Mitigation Measures**

## Operational Activities

No.	Construction Activity	Attribute	Character of Impact	Mitigation	Post Mitigation Impact
1.	Hydrocarbon laden surface water runoff from roads, carparks and general hardstanding	Groundwater Surface Water	Road surface runoff and poorly designed drainage system being channelled to groundwater and surface water can result in contamination of the subsurface and proximate rivers/streams and wetlands.	<p>An appropriately designed drainage system has been designed for the subject site. The system was designed in accordance with the CIRIA SUDS Manual 2015 and Recommendations for Site Development Works for Housing Areas published by the Department of the Environment and Local Government.</p> <p>It is proposed to use a sustainable urban drainage systems (SuDS) approach to stormwater management throughout the site, the overall strategy aims to provide an effective system to mitigate the adverse effects of urban stormwater runoff on the environment by reducing runoff rates, volumes and frequency, reducing pollutant concentrations in stormwater, contributing to amenity, aesthetics and biodiversity enhancement and allow for the maximum collection of rainwater for re-use where possible.</p> <p>The SuDS features includes swales, filter strips, filter drains, oil-water interceptor and permeable paving.</p>	Imperceptible
2.	Reduced infiltration of rainwater to the underlying aquifer	Groundwater Surface Water	The increased presence of hard standing across a large area could potentially reduce the amount of infiltration of rainwater to the underlying aquifer and potential impact on the hydrogeological and hydrological regime.	The surface water collection and infiltration system for the entire site has been designed in accordance with the CIRIA SUDS Manual 2015 and Recommendations for Site Development Works for Housing Areas published by the Department of the Environment and Local Government. It also incorporates partial infiltration design on all SuDS features.	Imperceptible

				Therefore, the potential impact on reduced rainfall infiltration has been minimised with the overall effects anticipated to be low, long-term and imperceptible.	
3.	Flood Risk - Pluvial	Surface Water	Flooding from surcharging or blocking of the developments' drainage systems.	<p>Drainage system has been designed in accordance with the regulations e.g. Greater Dublin Strategic Drainage Study (GDSDS) and considering the flood exceedance for storms of return periods exceeding 1% AEP (Annual Exceedance Probability).</p> <p>Proper operation and maintenance of the drainage system will be implemented to reduce the risk of human or mechanical error causing pluvial flood risk from blockages etc.</p>	Imperceptible

**Table 16.3 Predicted Operational Stage Mitigation Measures**

### 16.3.10 Noise and Vibration

#### Mitigation Measures

##### Site Development and Construction Phases

The use of preformed built elements is a significant mitigating factor to reduce the duration of the construction phase and in turn the duration of the construction-related noise impacts.

As development proceeds from north to south, intervening distances will increase from the bulk of receptors in Ballygossan Park.

The following noise and vibration management measures shall apply to the proposed project to ensure that the threshold value for noise and vibration (as applied to buildings) are complied with:

- A Site Representative shall be appointed for matters related to noise and vibration.
- Any complaints received shall be thoroughly investigated.
- A written complaints log shall be maintained by the Site Representative. This shall, at a minimum, record complainant's details (where agreed) the date and time of the complaint, details of the complaint including where the effect was observed, corrective and preventative actions taken and any close-out communications. This will ensure that the concerns of local residents who may be affected by site activities are considered during the management of activities at the site.
- Noise monitoring with capability for real-time review both on-site and remotely by Project Management shall be conducted at nearby NSRs throughout. Monitoring will be conducted at NSR1 and 3 at a minimum. As development moves south, monitoring shall be conducted at NSRs 2 and 5.
- In the event of exceedance of the limits at NSRs, works shall be ceased and measures implemented immediately to ensure that the limits are complied with and/or duration in minimised.
- Noise monitoring with capability for real-time review will facilitate immediate mitigation at nearby NSRs especially when noisy activities are planned.
- Due to the proximity of separate development sites, and where works are occurring in tandem, individual Site Representatives or their appointed noise and vibration representatives will be required to liaise on management of construction noise impact through real-time review of monitoring data to ensure that the limits are met cumulatively.
- Temporary acoustic screening shall be placed along the boundaries with NSRs where works take place close to the boundary. As a general rule of thumb, it is recommended that temporary screening break the "line of sight" from the sources to the affected windows of the nearest NSRs where possible. It is likely that screening will be required at NSR1 throughout the duration of the proposed works.
- The screening should be of sufficient surface density (minimum 10 kg/m<sup>2</sup>) to mitigate temporary noise impact associated with the construction phase.
- The operation of certain pieces of equipment, where substitution etc cannot be carried out shall be managed through monitoring and timing of use to ensure that the threshold values/criteria specified are complied with.
- During the construction phase all equipment shall be required to comply with noise limits set out in EC Directive 2000/14/EC as amended by Directive 2005/88/EC on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors. The directive covers equipment such as compressors, welding generators, excavators, dozers, loaders and dump trucks.
- While piling is dictated by constraints such as ground conditions (although a worst-case scenario has been assessed in this chapter) the design and final method chosen shall ensure compliance with the threshold limits for noise and vibration as set out in this chapter and limits proposed by Irish Rail for the rail line.



- Measures such as use of an acoustic shroud, damping of the hammer impact and enclosure of the hammer shall be considered for reducing noise impact if applicable to the final piling design.
- At the time of tender, the contractor will be obliged to review all systems taking noise and vibration into account in the choice of equipment. As noted in BS5228-1, *“the construction industry is generally innovative and constantly developing, and there may be proprietary systems available at the time of tender that were not known or available at the planning stage.”*
- Vibration monitoring will be conducted when sources which potentially could cause vibration impact to buildings will be in use e.g. during piling at NSR5. In this regard, test monitoring will be conducted with the equipment on at low levels before increasing incrementally to operational levels if deemed necessary. Works will be ceased and mitigation measures implemented during the construction phase where monitoring detects vibration levels associated with the works above the relevant guidance values for building damage as set out in Section 10.5.1.2.

The CEMP submitted with this application shall include the noise and vibration management measures listed above.

### Operational Phase

#### **Existing NSRs**

No additional specific mitigation measures are proposed for existing NSRs in the long term.

#### **Future Residents**

The following mitigation measures apply in the long term:

- Balustrades proposed on balconies for units close to rail line are as high as possible to further improve usability from a noise perspective. The balustrades will be made from a solid material (minimum surface density 10 kg/m<sup>2</sup>) with no gaps in the construction taking account of other factors such as adequate daylighting.
- The following is an average A-weighted spectrum for passing trains recorded at NMP5 and NMP6 within 10-15m distance unscreened from the rail line:

**Table 16.4 Passing Train Spectra**

Source	63	125	250	500	1000	2000	4000	8000	Total L <sub>Ae</sub> (dBA)
	Hz								
	64	73	72	75	76	73	67	57	82

*Free-field.*

- Although the Project will achieve the internal criteria with open or partially open windows, it is recommended that the final glazing chosen during the detailed design stage takes account of the spectral characteristics of train noise as indicated in Table 16.4 above and performs sufficiently at low frequencies to future proof the development and afford residents the option to further reduce noise ingress to indoor areas.
- Final specifications for glazing and ventilation shall be approved by an acoustic specialist at detailed design stage.
- Glazing suppliers shall provide laboratory tests confirming the sound insulation performance to BSEN ISO 140 Part 3 1995 and BS EN ISO 717, 1997.

## Monitoring

The contractor will be required by contractual obligation to ensure construction activities operate within the noise and vibration limits set out within this assessment. The contractor will be required to undertake real-time noise monitoring at locations representative of the closest NSRs to ensure the relevant criteria are not exceeded. Vibration test monitoring will be required at NSRs and at the rail line in accordance with Irish Rail requirements, especially during piling to ensure that limits are not exceeded

### 16.3.11 – Material Assets Traffic

#### Construction Phase

The Construction Management Plan will be prepared as part of the planning application with an associated Construction Traffic Management Plan (CTMP) which will incorporate a range of integrated control measures and associated management activities with the objective of minimising the construction activities associated with the development. The following initiatives, which will represent contractual obligations for the appointed contractor; will be implemented to avoid, minimise and/or mitigate against the anticipated construction impacts:

- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and roads;
- Appropriate on-site parking and compound area will be provided to prevent overflow onto the local network;
- It is likely that some numbers of the construction team will be brought to/from the site in vans/minibuses, which will serve to reduce the trip generation potential;
- Delivery vehicles to and from the site will be spread across the course of the working day, therefore, the number of HGVs travelling during the peak hours will be relatively low;
- Truck wheel washes will be installed at construction entrances and any specific recommendations with regard to construction traffic management made by Fingal County Council will be adhered to;
- Potential localised traffic disruptions during the construction phase will be mitigated through the implementation of industry standard traffic management measures. These traffic management measures shall be designed and implemented in accordance with the Department of Transport's Traffic Signs Manual "*Chapter 8 Temporary Traffic Measures and Signs for Roadworks*" and "*Guidance for the Control and Management of Traffic at Roads Works – 2nd Edition*" (2010); and
- Site entrance point/s from the public highway will be constructed with a bound, durable surface capable of withstanding heavy loads and with a sealed joint between the access and public highway. This durable bound surface will be constructed for a distance of 10m from the public highway.
- Material storage zone will be established in the compound area and will include material recycling areas and facilities;
- 'Way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas;
- Dedicated construction haul routes will be identified and agreed with Fingal County Council prior to commencement of activities on-site; and
- On completion of the works, all construction materials, debris, temporary hardstands etc. from the site compound will be removed off-site and the site compound area reinstated in full on completion of the works.

#### Operational Phase

A package of integrated mitigation measures has been identified to off-set the additional local demand that the proposed residential development at the subject site could potentially generate as a result of the forecast increase in vehicle movements by residents of the scheme. The identified measures and associated timescale for their implementation are summarised below.

- **Management** – A Mobility Management (MMP) is compiled with the aim of guiding the delivery and management of coordinated initiatives by the scheme promotor to be implemented upon occupation of the site. The MMP will ultimately seek to encourage sustainable travel practices for all journeys to and from the proposed development.
- **Infrastructure by Applicant 2022/2023** – Off-site junction enhancements at Millers Lane junctions.
- **Infrastructure (By Others)** – The aspirations of the Fingal County Council Development Plan seeks the implementation of the Skerries Southern Relief Road (Local Objective No 10) which upon delivery will transform local traffic characteristics along Golf Links Road. Whilst the proposed off-site junction enhancements have been proved to fully mitigate the predicted impact from both the subject LDA development and the neighbouring Noonan plot and will provide further relief to the existing local road network.
- **Infrastructure (Bicycle Facilities)** – The development proposals seek to encourage sustainable travel habits through the provision of a network of dedicated infrastructure connections for active modes of travel. This includes the implementation of (i) segregated bicycle tracks along the eastern side of the proposed developments main north-south 'link' street, (ii) the provision of a dedicated shared ped / cycle connection along the entire western boundary of the subject site which links into existing and emerging (Noonan Construction site) onwards connections subsequently providing an attractive and convenient route to/from the R127 Dublin Rd corridor, and (iii) internal traffic free pedestrian links that provide an attractive and positive advantage (e.g. shortest route) for pedestrians.
- **Infrastructure (Bicycle Facilities)** – With the objective of encouraging the local journeys to be undertaken by bicycle, the design of the LDA residential development includes the provision of a total of 802 bicycle parking opportunities including both long term (residents) and short term (visitors) bicycle parking facilities. This overall quantum complies with development management standards. Furthermore, in accordance with best practice the dedicated long term (residents) bicycle parking all benefit from the provision of secure weather protection.
- **Infrastructure (Permeability)** – The design of the scheme proposals has sought to maximise the ability to provide attractive connections to the third-party lands surrounding the subject development site. The implementation of pedestrian / cycle infrastructure extending right up to the boundary of the site enables the planning authority, in consultation with third parties as appropriate; to deliver a network of permeable linkages between the subject development lands and both existing and future developments adjoining the subject site.
- **Car Sharing** – The applicant is in negotiations with GoCar, the leading car sharing service provided in Ireland; to locate and base a GoCar vehicle on-site within the subject development. The availability of car sharing on-site provide a viable alternative to residents owning private vehicles whilst still having access to a car when required.

### 'Worst Case' Scenario

As stated previously, the analysis carried out represents a worst-case appraisal of a typical weekday as it is focused upon the two busiest periods of the day (i.e., AM and PM peak hours). During the remaining 22 hours of the day, traffic flows are predicted to be significantly lower resulting in the network operating with additional reserve capacity to that forecast for the peak hour periods. Similarly, over the weekend periods both the site generated traffic and the external road network traffic flows are generally lower compared to the weekday peak hour periods that have been assessed.

## **Monitoring**

### Construction Phase

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
- Timing of construction activities.

## Operational Phase

As part of the MMP process, bi-annual post occupancy surveys are to be carried out in order to determine the success of the measures and initiatives as set out in the proposed MMP document. 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.

### **16.3.14 Material Assets – Waste**

#### **Mitigation**

##### Construction Phase

Prior to commencement, the contractor(s) will be required to prepare a site-specific Resource and Waste Management Plan (RWMP) The RWMP will be prepared in accordance with the “*Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Development Projects*” and shall set out the proposed mechanisms for the proper handling, segregation, storage, recycling and/or disposal of all wastes and by-products associated with the proposed development at the subject site.

The RWMP will develop as the project progresses from design through to construction. The structure of the plan shall be flexible and proportionate with the waste management approach based on the international principles of optimising resources and reducing waste on construction projects through Prevention, Reuse, Recycling, Green Procurement Principles, Off-Site Construction, Materials Optimisation and Flexibility and Deconstruction.

The construction contractor will be required to employ a suitably qualified Resource Manager (RM) with expertise in waste and resource management to implement the requirements of the RWMP.

Excavation works will be required to facilitate the development. The project engineers estimate that 10,702m<sup>3</sup> of stripped topsoil and 20,386m<sup>3</sup> of excavated subsoil will be generated. All of the stripped topsoil and 10,523m<sup>3</sup> of excavated subsoil will be reused as part of the developments permanent landscaped works while 9,863m<sup>3</sup> of subsoil will need to be moved offsite. 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 or on the receiving environment.

The following mitigation measures will be implemented at the site:

- Materials will be ordered on an ‘as needed’ basis to prevent over supply;
- A take back/buy back system will be set up with the supplier of the construction materials;
- Panelling, coverings and other raw materials will be ordered to size, shape and form to minimise excessive scrap waste and handled through centralised cutting operations on site;
- Construction materials will be handled and stored properly to prevent damage;
- Construction operations will be carried out in the correct sequence to prevent damage to other construction works;
- Individual responsibility will be assigned to all contractors working on site for the management of wastes arising from their activities;
- Excavated soils will be used in the landscaping of the development;
- Waste wood will be reused in the making of site signs or storage compounds;

Recycling of waste will be achieved by segregating wastes such as spoiled timber and hoarding, concrete, asphalt and bitmac and sending them off-site to licensed waste management facilities for further processing and recycling. All packaging waste will be returned to the supplier where possible. Where this is not possible the packaging materials will be segregated and stored in skips for subsequent off-site recycling.

All management of waste at the subject site will be undertaken in accordance with the Waste Management Act 1996 as amended, Waste Management (Collection Permit) Regulations 2007 and Amendments and Waste Management (Facility Permit & Registration) Regulations 2007 as amended.

These mitigation measures will ensure that waste generation rates at the site are minimised and that all wastes generated will be managed in an environmentally sound manner and in compliance with the relevant waste legislation.

### Operational Phase

An Operational Waste Management Plan (OWMP) has been prepared as a stand-alone report to accompany this planning application. The OWMP has been prepared to demonstrate how the required infrastructure will be incorporated into the design and operational management of the development to ensure that domestic wastes will be managed and monitored with the objective of maximising the quantity of waste segregated at source and maximising the volume of clean recyclable materials generated by the residents of the development.

Each residential unit will provide sufficient internal storage space for the storage of mixed dry recyclables, mixed non-recyclables, organic waste and glass. Each unit shall include waste storage bins which will be of such a size that will allow easy manual handling of them to be brought to the private bin stores.

Each residential unit will have its own external private bin stores that will house three separate bins to provide full segregation for maximum recycling. Each bin in the bin store will be clearly labelled and colour coded to avoid cross-contamination of the different waste streams. Signage will be posted above or on the bins to show exactly which waste types can be placed in each bin. The bin stores will comprise a galvanised metal frame and will be formed using timber composite panels. Each unit will be lockable and will have a hinge lid and a pair of front doors for full access. All bins will be securely stored in the locked unit and will be wheeled to kerbside on bin collection day and returned to the locked unit after waste collection.

Communal waste storage facilities will be provided for a total of 76 residential units across four of the residential blocks where private bins stores were identified as not practical for these residents. The residential units where communal waste facilities will be provided are the following:

- the lower ground level units in in Block A1 comprising of 13 no 2-bedroom apartments;
- the lower ground level units in in Block A2 comprising of 11 no 2-bedroom apartments;
- the Block E units which are entered via the courtyard comprising of 24 no 1-bedroom duplexes and 1 no 3-bedroom duplexe; and
- the Block F units which are entered via the courtyard comprising of 16 no 1-bedroom duplexes and 11 no 2-bedroom duplexes.

The common waste storage areas have been designed as covered buildings to ensure safe access for all users in a brightly lit area, spacious enough for easy manoeuvrability, good ventilation and ready access for the control of vermin if required. The communal bin stores also provides for sufficient access and egress to enable the bins to be easily moved from the stores to an appropriate collection point nearby. The bin stores all comply with the following requirements:

- A well-defined pedestrian route will be marked from the relevant residential units to the nearest waste storage area.
- A non-slip surface will be provided within the waste storage area.
- Adequate ventilation to avoid the creation of stagnant air or foul odours.
- Sensor controlled lighting.
- Appropriate wastewater drainage to allow for cleaning and disinfection.
- Provision of appropriate signage to inform residents of their obligation to reduce waste, segregate waste and to use the correct bins for each waste.
- The waste storage area will be designed to provide safe access from the apartment units by mobility impaired persons.
- All waste storage bins will be clearly labelled with exactly what type of waste materials may be deposited within them. Provision will be made for sufficient segregated storage of mixed dry recyclables, mixed non-recyclables, organic waste and glass at each bin store.

Waste glass will be stored in centrally located containers with easy access for all residents of the development. The development will generate approximately 3.3m<sup>3</sup> of glass waste per week and will be stored in 3 no 1,100L bins which will be colour coded to facilitate segregation according to glass colour of clear, green and brown.

### Monitoring

The RWMP will require that all waste generated during the construction phase is weighed and logged. Records will be kept detailing the quantities of each waste stream generated and how the waste was managed including onsite storage, removal from site and next and final destination.

The Facility Management Company for the residential development will maintain a register of all waste volumes and types collected from the development each year including a break-down of recyclable waste and where necessary, shall introduce initiatives to further encourage residents to maximise waste segregation at source and recycling.

### **16.3.13 Material Assets Utilities**

#### Mitigation Measures

A detailed “Construction Management Plan” will be prepared by the Contractor and implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the “Construction Management Plan”.

#### *Foul Sewerage*

- In order to reduce the risk of defective or leaking sewers, all new sewers should be laid in accordance with the relevant standards, pressure tested, and CCTV surveyed to ascertain any possible defects.
- The construction compound will include adequate staff welfare facilities including foul drainage. Foul drainage discharge from the construction compound will be removed off site to a licensed facility until a connection to the public foul drainage network has been established.
- It is envisaged that the development would take place and be occupied over a reasonable time period, and therefore the downstream foul sewerage system (foul sewer network and wastewater treatment facility) would be gradually loaded.

#### *Surface Water*

- 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.
- In order to mitigate against spillages contaminating the surrounding surface water and hydrogeological environments, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstanding area. Refuelling and servicing of construction machinery will take place in a designated hardstanding area which is also remote from any surface water inlets (where not possible to carry out such activities off site).
- Concrete batching will take place off site and wash down and wash out of concrete trucks will take place off site (at authorized concrete batching plant in full compliance with relevant planning and environmental consents).
- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
- In order to reduce the risk of defective or leaking sewers, all new sewers should be laid in accordance with the relevant standards, pressure tested, and CCTV surveyed to ascertain any possible defects.
- Regular maintenance of the drainage network including the petrol interceptor, flow control device and surface water storage system will ensure that they are operating correctly.
- The design of proposed site levels (roads etc.) has been carried out to ensure the proposed development is elevated and set in such a way as to avoid concentrating additional surface water flow in a particular location.
- Surface water runoff from the site will be attenuated to the greenfield runoff rate as outlined in the Greater Dublin Strategic Drainage Study 2005 (GDSDS).
- Surface water discharge rates will be controlled by a Hydrobrake type vortex flow control device.
- A contract will be entered into with a suitably qualified contractor for maintenance of the attenuation system, Hydrobrake and fuel / oil separator noted above.

#### *Water Supply*

- The watermains will be tested according to the requirements of Irish Water and Fingal County Council prior to commissioning.

- 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.

#### *Utilities*

- The electrical ducting and infrastructure is to be installed to the requirements of ESB Networks and the national standards.
- The comms ducting and infrastructure is to be installed as per the requirements of the provider.

These mitigation measures are also contained in the Construction and Environmental Management Plan under separate cover.

#### *Monitoring*

No monitoring is required in addition to those specifically noted in other chapters of the EIAR.

#### **16.3.15 Risk Management**

The Construction Management Plan as well as good housekeeping practices will limit the risk of accidents during construction.