

## Chapter 15:

# Summary of EIAR Mitigation and Monitoring Measures

## 15.0 SUMMARY OF EIAR MITIGATION & MONITORING MEASURES

### 15.1 INTRODUCTION

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

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

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

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

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

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

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

### 15.2 MITIGATION STRATEGIES

#### 15.2.1 Introduction

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

### **15.2.2 Mitigation by Avoidance**

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

### **15.2.3 Mitigation by Reduction**

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

### **15.2.4 Reducing the Effect**

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

### **15.2.5 Reducing Exposure to the Impact**

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

### **15.2.6 Mitigation by Remedy**

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

## **15.3 MITIGATION AND MONITORING MEASURES**

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

### **15.3.1 Project Description & Alternatives Examined**

#### **Construction Phase**

Not applicable.

#### **Operational Phase**

Not applicable.

#### **Monitoring**

Not applicable.

### 15.3.2 Population and Human Health

#### **Construction Phase**

##### **P&HH CONST 1: Construction and Environmental Management Plan**

It will be necessary for the appointed contractor to prepare and implement a construction and environment management plan (including traffic management) to 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. The measures incorporated into the Preliminary Construction and Environmental Management Plan and this EIAR will inform the CEMP, which can be agreed with the Planning Authority prior to commencement of development.

##### **P&HH CONST 2: Resource and Waste Management Plan**

The measures outlined within the Resource and Waste Management Plan submitted with the application will be carried out in full during the construction stage in accordance with the requirements of the Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects.

#### **Operational Phase**

Not applicable.

#### **Monitoring**

This section addresses the effects that require monitoring, along with the methods and the agencies that are responsible for such 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, land and soils and noise and vibration sufficiently address monitoring requirements.

### 15.3.3 Archaeology, Architecture and Cultural Heritage

#### **Construction Phase**

##### **Archaeology**

The following mitigation measures are recommended:

##### **ARCH CONST 1: Preservation in-situ**

A large portion of AA1 (c. 90%) will be preserved in-situ during construction in order to retain the area of greenfield. Small sections of ditches in the north and east of the site will be affected by ground works. The archaeological exclusion area (Figure 4.7) will be established at construction stage in order to prevent inadvertent construction impacts. The small portions of the site to be impacted will be preserved by record. This will be carried out under licence to the National Monuments Service of the DoHLGH. Full provision will be made available for the resolution of the archaeological remains, both on site and during the post-excavation process.

##### **ARCH CONST 2: Archaeological Preservation by Record**

Whilst it is acknowledged that the preservation in-situ of archaeological remains is indeed the best manner in which to conserve the archaeological resource, the required layout of the development means that the archaeological features and deposits within AA2-13 (excluding AA8 and 9) will be subject to archaeological preservation by record (prior to the commencement of construction). This will be carried out under licence to the National Monuments Service of the DoHLGH. Full provision will be made available for the resolution of the archaeological remains, both on site and during the post-excavation process. The design rationale examining why the archaeological areas cannot be avoided is included in Appendix 4.9 of this EIAR.

### **ARCH CONST 3: Topsoil Stripping**

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

#### **Architecture**

No mitigation is required for the architectural heritage resource during construction.

#### **Cultural Heritage**

##### **CH CONST 1: Underwater Assessment**

An underwater archaeological assessment will be carried out along the path of the watercourse, where it will be affected by new crossing points. This will be carried out under licence to the National Monuments Service of the DoHGLH. Should any archaeological remains be identified, consultation will be required with the National Monuments Service of the DoHGLH as to whether preservation by record or in-situ is carried out.

#### **Operational Phase**

#### **Archaeology**

##### **ARCH OPERA 1: Archaeological conservation / management plan**

An archaeological conservation/management plan will be developed in order to inform future operations of the development within AA1 and ensure the area is managed appropriately. The plan will be compiled by a suitably qualified archaeologist and contain a list of proscribed activities and policies on future site maintenance.

#### **Architecture**

No mitigation is required.

#### **Cultural Heritage**

No mitigation is required.

#### **Monitoring**

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

### **15.3.4 Biodiversity**

#### **Construction Phase**

##### **BIO CONST 1: Bird Mitigation**

###### **Site Clearance**

Site clearance has the potential to impact on birds particularly when carried out during bird nesting season. This could potentially result in the destruction and/or disturbance to nests leading to injury/death or an increase in predation risk to birds. The following mitigation will be carried out in relation to birds:

- Ecology Supervision will be carried out on site by a qualified ecologist to ensure that site clearance does not significantly impact on bird species. This would include the protection of the kingfisher habitat and prey within the watercourse from silt and petrochemicals.
- No clearance works will be carried out outside the redline or in tree protection zones.
- “Relevant guidelines and legislation (Section 40 of the Wildlife Acts, 1976 to 2012) Should this not be possible, a pre-works check by a qualified ecologist should be undertaken to ensure nesting birds are

absent. If nesting birds are present a derogation licence will be sought from NPWS. If this is not forthcoming works to remove the nesting habitats will not commence within bird nesting season.

- An ecologist will be on site during site clearance to minimise impact on foraging/roosting bird species. The ecologist will have the ability to cease works on site that could cause disturbance, in the event of significant disturbance impacts being possible
- 20 bird boxes will be placed on site to offset nesting loss.

### **BIO CONST 2: Bat Mitigation**

#### **Lighting**

No roosts or potential roosts will be impacted. However, construction activities have the has the potential to impact on bats foraging particularly when lighting is note carried out sensitively during the construction phase. Lighting directed towards hedgerows and treelines can impact on foraging activity. The foraging areas for bats bordering the woodland and hedgerows need to be protected from light spill during construction and operation. The following mitigation will be carried out in relation to bats:

- Ecology Supervision will be carried out on site by a qualified ecologist. All lighting proposals for the construction phase will be discussed with the ecologist and there will be no direct lighting of treelines and hedgerows, with all lighting to face inwards within the site.

### **BIO CONST 3: Terrestrial Mammal Mitigation**

#### **Resting and breeding places in addition to ensuring connectivity.**

There is potential for mammals of conservation importance to enter the site and establish resting and breeding places between the original survey and the commencement of works. The construction of water crossings can lead to the fragmentation of mammal territories. The following mitigation will be carried out in relation to terrestrial mammals:

- A preconstruction mammal inspection will be carried out.
- Mammal passes will be placed within culverts/bridges any stream crossings.

### **BIO CONST 4: Aquatic Biodiversity Mitigation**

#### **Instream works**

Given that there are two watercourses within the proposed development site and works are proposed in the vicinity of the watercourses, including crossings, there is potential for localised and downstream impacts on aquatic biodiversity. The following mitigation will be carried out in relation to aquatic biodiversity:

- Inland Fisheries Ireland will be provided with an up to date CEMP and methodology statement prior to construction works commencing on site. This will include detailed methodologies for the watercourse crossings on site which are to include non-wooden mammal passes.
- Ecological supervision of all instream or riparian works will be carried out by an aquatic ecologist with previous Ecological Clerk of Works experience in riparian works including watercourse crossings.
- Silt fencing will be placed at key work locations in the vicinity of the watercourse subject to approval of the aquatic ecologist.

### **BIO CONST 5: Retention and Protection of Vegetation during Construction**

The tree constraints plan will be followed and vegetation retained where outlined. This includes trees, hedgerows and the woodland areas. In addition, the following mitigation will be carried out:

- Temporary fencing will be erected (as outlined in the arborist report) to include the Root Protection Area (RPA) of the trees.
- A qualified arborist shall oversee the implementation of tree protection and site clearance on site.

## **Operational Phase**

### **BIO OPER 1: Bats**

#### **Lighting**

The proposed development in the long term could potentially impact on bat foraging in the local area. The following mitigation will be carried out in relation to bats:

- No lights should be directed towards the hedgerows or woodland and during operation a post construction assessment will be carried to ensure compliance with Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers and that light levels at the edge of the treeline are not >1 lux.
- A post construction light assessment and bat surveys will be carried out.

#### **Monitoring**

No specific monitoring is required beyond the measures outlined above.

### **15.3.5 Landscape and Visual Impact**

The proposed development is a considered response to the sensitivities of the landscape (see Section 6.6.2.1 of the LVIA chapter), the opportunities provided by the site, and the relevant policy which encourages the site's development. The proposal incorporates all the avoidance and mitigation measures required to either limit the landscape and visual effects impacts to an acceptable level (e.g. the case of the Willow Park interface), or to ensure that the effects are positive.

No negative potential landscape or visual effects have been identified. Therefore, no avoidance, remedial or mitigation measures are recommended.

#### **Monitoring**

The retention of certain existing hedgerows, trees and tree groups on site is an important element of the proposal. Any unplanned loss of hedgerows or trees could result in negative landscape and visual impacts.

The planning application is accompanied by an Arboricultural Report prepared by Arborist Associates Ltd, which includes a detailed Tree Protection Strategy. It includes the requirement that (a) all tree works should be undertaken under the guidance of the project arborist, (b) that site works potentially affecting the hedgerows and trees to be retained should be monitored, and (c) that on completion of site works the retained trees are to be re-examined and any necessary remedial works to ensure the health of the trees implemented.

The implementation of the Tree Protection Plan is the only monitoring required in respect of potential landscape and visual impacts.

### **15.3.6 Land and Soils**

## **Construction Phase**

### **L&S CONST 1: Construction Environmental Management Plan (CEMP)**

A Construction Environmental Management Plan (CEMP) shall be prepared and agreed with the Planning Authority prior to commencement of development, and include the following mitigation measures:

- Stripping of topsoil to be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.

- Topsoil stockpiles to be protected for the duration of the works and not located in areas where sediment laden runoff may enter watercourses.
- Topsoil stockpiles to be located on site so as not to necessitate double handling.
- Topsoil to be re-used throughout the development in landscaping and public open spaces / linear park.
- Disturbed subsoil layers to be stabilised as soon as practicable - backfilling of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping, to be carried out promptly to minimise the duration that subsoil layers are exposed to the effects of weather and construction vehicles.
- Stockpiles of excavated subsoil material to be protected for the duration of the works and located separate to the topsoil stockpiles.
- Construction site mitigation such as wheel wash and dust suppression measures to be implemented as recommended the PCEMP.
- Measures to be implemented to capture and treat sediment laden surface water runoff especially from basement excavations and stripped land (e.g. sediment tanks, surface water inlet protection and earth bunding adjacent to open drainage ditches).
- Where feasible, excavated subsoil material to be reused as part of the site development works (e.g. for landscaping works and for backfill to basements and trenches under non-trafficked areas).
- Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes on the site and entering the site.
- All oils, fuels, paints and other chemicals to be stored in a secure bunded hardstanding area.
- Refuelling and servicing of construction machinery to take place in a designated hardstanding area, remote from surface water inlets (when it is not possible to carry out such activities off-site).
- Good housekeeping (site clean-ups, use of disposal bins, etc.) on the site project.
- Any hazardous materials to be stored within secondary containment designed to retain at least 110% of the storage contents - to prevent the accidental release (fuels, paints, cleaning agents, etc.) with bunds for oil/diesel storage tanks.
- Any material removed from site shall be classified before removal to ensure it is disposed of to an appropriately licensed landfill or recovery facility in accordance with The Waste Management (Hazardous Waste) Regulations 1998. Unsuitable material that cannot be reused on site to be disposed off-site under license.
- Where bedrock / boulders are encountered in excavations, option to crush and reuse to be considered depending on quantity of material excavated. Screened material may be reused as a fill material e.g. in road construction and backfill to service trenches.
- Where feasible, excavated material will be reused as part of the site development works (e.g. use as fill material beneath roads) however, unsuitable excavated subsoil is expected and will have to be removed to an approved landfill.
- The Environmental Site Assessment & Waste Classification report O'Callaghan Moran & Associates (OCM) (included in Appendix B of the Infrastructure Design Report) recommend that a copy of the report be provided in full to the relevant waste management facilities to which the made ground and subsoils will be consigned to confirm their suitability of acceptance.

### **Operational**

#### **L&S OPERA 1: Sustainable Urban Drainage**

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



## **Monitoring**

Construction phase monitoring relates to the good maintenance of mitigation measures outlined above in section 7.6 including the project specific Construction Management Plan (PCEMP). Soil removed during the construction phase is to be monitored to maximise potential for re-use on site. Monitoring of any hazardous material stored on-site will form part of the proposed Resource (Construction) Waste Management Plan. A dust management/monitoring programme should be implemented in accordance with the mitigation measures in section 7.6 and the PCEMP.

### **Monitoring measures – construction**

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

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

### **15.3.7 Water**

#### **Construction Phase**

##### **WATER CONST 1: Construction and Environment Management Plan**

General site works:

- It is recommended that best practice construction methods and practices complying with relevant legislation to avoid or reduce the risk of contamination of watercourses or groundwater in accordance with section 8.6.1 and the CEMP.
- It is recommended that a Site Specific Construction and Environment Management Plan be developed and implemented during the construction phase. Site inductions to include reference to the procedures and best practice as outlined in the PCEMP, prepared by DBFL Consulting Engineers, submitted with the SHD application.
- Measures to be implemented to capture and treat sediment laden surface water runoff especially from basement excavations and stripped land (e.g. sediment tanks, surface water inlet protection and earth bunding adjacent to open drainage ditches).
- Weather conditions and seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.
- The extent of sub-soil and topsoil stripping to be minimised to reduce the rate and volume of the run-off during construction until the topsoil and vegetation are replaced.
- Concrete batching will take place off site or in a designed area with an impermeable surface.
- Concrete wash down and wash out of concrete trucks will take place on-site into an appropriate washout facility.
- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement tanks.

- Oil and fuel stored on site for construction should be stored in designated areas. These areas shall be bunded and should be located away from surface water drainage and features.
- Refuelling and servicing of construction machinery to take place in a designated hardstanding area, remote from surface water inlets (when it is not possible to carry out such activities off-site).
- Any hazardous materials to be stored within secondary containment designed to retain at least 110% of the storage contents - to prevent the accidental release (fuels, paints, cleaning agents, etc.) with bunds for oil/diesel storage tanks.
- Spill kits will be kept in designated areas for re-fuelling of construction machinery.
- Dewatering measures will only be employed where necessary.

### **Operational Phase**

#### **WATER OPERA 1: Scheme Design and Maintenance**

- The design of proposed site levels (roads, FFL etc.) has been carried out to replicate existing surface contours, break lines etc. and therefore replicating existing overland flow paths, and not concentrating additional surface water flow in a particular location.
- Surface water runoff from the site will be attenuated to the greenfield runoff rate as recommended in the Greater Dublin Strategic Drainage Study (GSDSDS). Surface water discharge rates will be controlled by a Hydrobrake flow control device, with underground attenuation tanks, swales and detention basins provided to store runoff from a 1 in 100 year return period event. SUDs features are implemented in the surface water drainage network to reduce the rate of runoff from hard standing area sand to improve the quality of surface water runoff. For detailed information refer to DBFL Report number 180221-DBFL-XX-XX-RP-C-0002, "Infrastructure Design Report".
- Surface water runoff from the development will be collected by an appropriately designed system with contaminants removed prior to discharge i.e. petrol interceptor.
- A regular maintenance and inspection programme of the flow control devices, attenuation storage facilities, gullies and petrol interceptor will be required during the Operational Phase to ensure the proper working of the development's networks and discharges.
- Waste generated by the everyday operation of the development should be securely stored within designated collection areas with positive drainage collection systems to collect potential runoff.
- Operational waste should be removed from site using licenced waste management contractors.

### **Monitoring**

Construction phase monitoring relates to the good maintenance of mitigation measures outlined in Section 8.6 of the Water Chapter including the project specific Construction Environmental Management Plan (CEMP). It is recommended that any monitoring of any hazardous material stored on-site be carried out in accordance with the CEMP. It is recommended that a dust management/monitoring programme be implemented during the construction phase of the development in accordance with the CEMP.

#### **Monitoring measures – construction**

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

- Contractors will be recommended to adhere to the CEMP.
- Construction monitoring of the works (e.g. inspection of services and SuDS installation and backfill, stability of excavations etc.).
- Inspection of fuel / oil storage areas.

- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill; protection of soils from contamination for removal from site)
- Monitoring sediment control measures (sediment retention tanks, surface water inlet protection etc.)

### **Monitoring measures – operational phase**

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

- The taking in charge of the water infrastructure will ensure the system is regularly inspected and maintained.
- The performance of all SuDS features will be monitored by the relevant authorities during the life of the development.
- Monitoring of the installed hydrobrake, interceptor and gullies will be required to prevent contamination and increased runoff from the site.
- Although no specific monitoring will be required as part of the proposed development, it is envisaged that EPA Monitoring of the water quality of the water bodies will continue in the area through the life of the development.

### **15.3.8 Air Quality & Climate**

#### **Construction Stage**

##### **AIR CONST 1: Dust Control**

The proactive control of fugitive dust will ensure the prevention of significant emissions. The key aspects of controlling dust are listed below. Full details of the dust management plan can be found in Appendix 9.2. These measures have been incorporated into the overall Construction Environmental Management Plan (CEMP) prepared in respect of the proposed development.

In summary the measures which will be implemented will include:

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

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

### **CLIMATE CONST 1: Construction Controls**

Impacts to climate during the construction stage are predicted to be imperceptible however, good practice measures can be incorporated to ensure potential impacts are lessened. These include:

- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- Ensure all plant and machinery are well maintained and inspected regularly.
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

### **Operational Stage**

The impact of the operational traffic associated with proposed development on air quality and climate is predicted to be imperceptible with respect to the operational phase in the long term. Therefore, no site specific mitigation measures are required other than those set out in Section 9.5.2 of Chapter 9 in relation to operational phase energy usage.

### **Monitoring**

#### **Construction Stage**

Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/(m<sup>2</sup>\*day) during the monitoring period between 28 - 32 days.

#### **Operational Stage**

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

### **13.3.9 Noise & Vibration**

#### **Construction Phase**

##### **N&V CONSTR 1: CEMP and Noise**

The Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures and comply with the recommendations of BS 5228-1:2009+A1:2014 *Code of Practice for Noise and Vibration Control on Construction and Open Sites - Noise* and the European Communities (Noise Emission by Equipment for Use Outdoors) Regulations, 2001, and these should be set out in the CEMP.

#### **Operational Phase**

##### **N&V OPERA 1: Plant**

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

### **Monitoring**

The contractor will be required to ensure construction activities operate within the noise and vibration limits set out within this assessment. The contractor will be required to undertake regular noise and vibration monitoring at locations representative of the closest sensitive locations to ensure the relevant criteria are not exceeded.

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

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

### **15.3.10 Microclimate / Wind**

#### **Construction Phase**

No mitigation measures required.

#### **Operational Phase**

The impact of the proposed development on microclimate will be imperceptible. Thus, no site-specific mitigation measures are required.

### **Monitoring**

No monitoring is required.

### **15.3.11 Traffic and Transport**

#### **Construction Phase**

##### **T&T CONST 1: Construction & Environmental Management Plan and Construction Traffic Management**

- The Construction & Environmental Management Plan (a preliminary CEMP accompanies the application) and the associated Construction Traffic Management Plan (CTMP) in addition to the Resource (Construction) Waste Management Plan for the development will incorporate a range of integrated control measures and associated management initiatives with the objective of mitigating the impact of the proposed developments on-site construction activities
- All construction related parking will be provided on site. Construction traffic will consist of the following categories: -
  - Private vehicles owned and driven by site construction staff and by full time supervisory staff. The proposed on-site car parking area will be designed to have the capacity to accommodate this parking demand in addition to an element of visitor parking spaces
  - Excavation plant and dumper trucks involved in site development works and material delivery vehicles for the following: granular fill materials, concrete pipes, manholes, reinforcement steel, ready mix concrete and mortar, concrete blocks, miscellaneous building materials, etc
- On-site employees will generally arrive before 08:00, thus avoiding morning peak hour traffic. These employees will generally depart after 18:00 and avoid the PM peak hour
- To minimise disruption to the surrounding environment, the following mitigation measures will be implemented;
  - During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and roads.

- All road works will be adequately signposted and enclosed to ensure the safety of all road users and construction personnel.
- A dedicated 'construction' site access / egress junction will be provided during all construction phases.
- Provision of sufficient on-site parking for staff and visitors (as described above) and compounding through the construction of temporary hardstanding areas to ensure no potential overflow of construction generated traffic onto the local network.
- A material storage zone will also be provided in the compound area. This storage zone will include material recycling areas and facilities.
- A series of 'way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas.
- A dedicated construction haul route has been identified and will be agreed with the local authority prior to the commencement of construction activities on-site.
- Truck wheel washes will be installed at construction and discharge from wheel wash area will be directed to on-site settlement ponds.
- On completion of the works all construction materials, debris, temporary hardstands etc. from the site compound will be removed off site and the site compound area reinstated in full on completion of the works

### **Operational Phase**

#### **T&T OPERA 1: Mobility Management**

A Mobility Management Plan (MMP) is included with the application. The measures identified in the MMP form part of the specific mitigation of this EIAR and a dedicated resident specific Mobility Management Plan (MMP) is to be compiled with the aim of guiding the delivery and management of coordinated initiatives by the scheme promoter. Resident specific MMPs include specialised plans and associated implementation strategies for the subject development proposals. The MMP ultimately seeks to encourage sustainable travel practices for all journeys by residents and visitors traveling to and from the proposed development. It involves the incorporation of a wide range of possible "hard" and "soft" tools from which to choose from with the objective of influencing travel choices.

#### **T&T OPERA 2: Infrastructure**

The delivery of a through route between Dublin Road corridor and Shinkeen Road corridor will provide an alternative routing option between origins / destinations to the north / east negating the need to travel via the Dublin Road / Shinkeen Road junction. This will help improve the operational performance of the existing Dublin Road / Shinkeen Road junction.

#### **T&T OPERA 3: Permeability**

The proposed scheme design incorporates the LAP objectives of 'Green Links' through the site for the benefit of pedestrians and cyclists. The implementation of dedicated infrastructure along an integrated area wide catchment provides an attractive, convenient, seamless 'green' corridor providing a permeable, safe connection between existing (and future) residential neighbouring's.

### **Monitoring**

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

### **15.3.12 Material Assets**

#### **Construction Phase**

##### **MA CONST 1: Resource & Waste Management Plan**

The proposed development will comply with the provisions of the Resource and Waste Management Plan with respect to construction waste.

##### **MA CONST 2: Construction and Environmental Management Plan**

A construction and environmental management plan, including measures for construction traffic management, will be submitted prior to commencement of development and will be implemented in order to protect local amenities and the integrity and operation of the local road network during the construction phase.

##### **MA CONST 3: Provision of Utilities**

Provision of utilities will be carried out in accordance with the recommendations of the relevant statutory bodies and providers (ESB, Gas Networks Ireland, Irish Water, EIR, Kildare County Council etc.)

##### **MA CONST 4: Water Metering**

Water Metering will be included in each unit to record consumption.

#### **Operational Phase**

No mitigation measures are considered necessary during the operational phase.

#### **Monitoring**

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