Voyage Property Limited

Greenpark SHD Development

Planning Stage Construction and Environmental Management Plan

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1 Introduction

This Construction and Environmental Management Plan (CEMP) has been prepared by Gavin and Doherty Geosolutions (GDG) on behalf of Voyage Property Ltd for a proposed Strategic Housing Development (SHD) on a site at Greenpark Dock Road, Co Limerick. The CEMP has been prepared in parallel with the Environmental Impact Assessment Report (EIAR) for the project and takes cognisance of the specific mitigation measures outlined in the EIAR.

The CEMP provides a framework from which a construction stage CEMP will be developed to implement the mitigation measures described below which are designed to avoid, minimise or mitigate adverse construction effects on the environment during construction of the development. The CEMP will be finalised following grant of planning permission and prior to construction to include all relevant conditions imposed by An Bórd Pleanála. Additional mitigation measures may be added following consultation with relevant parties.

Should any ambiguity or contradiction arise in the preparation of the construction stage CEMP between the text of the CEMP, the mitigation measures and planning conditions, the following precedence shall apply:

1. Planning conditions
2. Mitigation measures
3. CEMP text

The Contractor shall comply with any conditions arising from the site constraints identified and specified, all Statutory Regulations governing the works, and any additional measures or modifications that may be imposed on the proposed development by the local authority.

1.1 Project Background

Voyage Property Ltd is proposing to develop a site to the east of the Limerick Greyhound Stadium located at Greenpark, Dock Road, Limerick as shown in Figure 1-1 The site is located at the former Limerick Racecourse and will be accessed via the N69 Dock Road to the west of the site. The site is bounded to the east by existing housing estate at Log na gCapall and Greenpark Avenue.

Figure 1-1 Proposed site location map (Google Earth Pro, 2020)

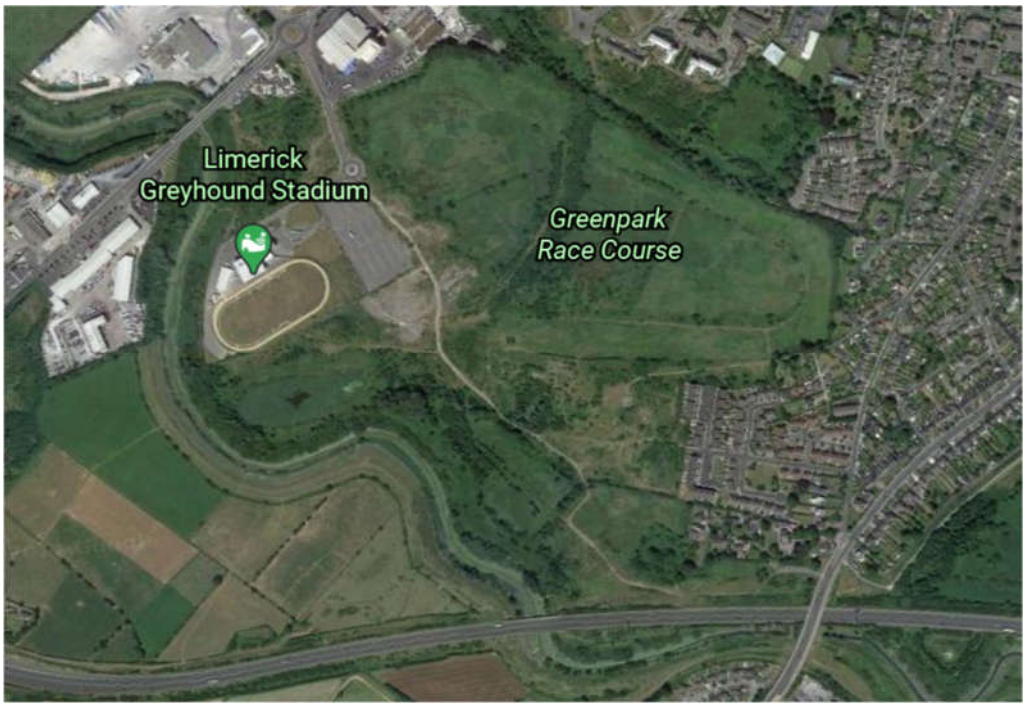

Figure 1-2 Aerial map (Google Earth, 2021)

1.2 Description of the Works

The proposed SHD will cover an area of 7.9 Ha approximately. It will consist of 371 units in total as well as associated green areas, access road, estate roads, boundary treatments, services and all other infrastructure required to develop a large housing project, the unit breakdown is itemised below:

- Apartment Block – 138 units,
- 2 Bedroom houses – 37 units
- 3 Bedroom houses – 110 units
- 4 Bedroom houses – 10 units
- 38 Duplex Apartment blocks – 76 units total
- Creche

Drawings of the development can be found within the planning documents; an outline of the development is reproduced below in Figure 1-3.

Figure 1-3 Proposed Development (Reddy Architects)

1.2.1 Topography

A tributary of the River Shannon (Ballynaclogh River) is located to the southwest of the site. The site slopes generally from east to west, existing levels vary between 2.5m OD and 10m OD approximately. The minimum finished floor level of all units will be 5.3m OD. Bulk earthworks are therefore required

to raise the lower portion of the site, fill from the higher levels will be used where possible to achieve an earthworks balance on the site.

1.2.2 Boundary Treatments

Because of the raising of site levels, boundary treatments will be required. The proposed levels will generally be graded up to meet the higher levels at Log na gCapall along the eastern boundary. This will avoid the need for retaining structures at the interface with the existing housing developments. The adjoining land to the south is not owned by the developer, a retaining structure will be required along a portion of this boundary. It is proposed to use reinforced soil embankments with a green vegetated face as the retaining structure. The adjoining lands to the west and north are in the ownership of the developer, retaining structures will not be required, embankment slopes will be formed within the SHD boundary.

1.2.3 Access Road

Access to the site will be from the N69 Dock Road. There is an existing entrance from the N69Dock Road that services the Limerick Greyhound Stadium. The road will tie into an existing roundabout at the greyhound stadium and proceed in a south easterly direction to meet the north-western corner of the SHD. Pedestrian and cycle access will be provided between the proposed development and existing developments to the east. No vehicular access will be permitted from the housing developments to the east. However, facility for emergency services to access the site will be provided.

1.2.4 Estate Roads

Estate roads will be constructed to provide access to the development. Roads will consist of an asphalt pavement on granular capping and subbase layers. Concrete footpaths will be provided. Services such as foul and surface water drainage, water, electricity, public lighting and telecommunications will be run under or next to the roads. Surface water from the roads will be collected in a drainage network and discharge to an existing constructed lagoon to the west of the site. The lagoon provides attenuation prior to discharge to the Ballynaclogh River.

1.2.5 Housing

The unit breakdown is given in Section 1.2 above. The housing units will be of typical domestic construction refer to the planning submission drawings for details. Foundations will be reinforced concrete (RC) raft footings. The buildings will be timber framed inner leaf with masonry/brick outer leaf. Concrete or paved entrance drives will be provided at the front of the units. The development will also include three apartment blocks and a creche facility.

1.2.6 Landscape Areas

Several green spaces and landscaped areas are provided within the development, refer to the Landscape Design Report for details.

2 Construction of the Development

2.1 Safety, Health, and Environmental Considerations

The appointed Contractor will be required to prepare a Construction Health & Safety Plan which will be put in place prior to commencement of the works. At a minimum, this plan will include:

- Construction Health & Safety training requirements
- Induction procedures
- Emergency protocols
- Details of welfare facilities
- Risk assessments and Method Statements

2.2 Phasing of the Development

It is envisaged that there will be some phasing of the development, as is commonplace for large housing developments. The exact configuration of the phasing has not been finalised at this stage, but the overriding principle will be to fully complete blocks of the development and isolate residents from the construction operations as much as possible.

2.3 Works Description

2.3.1 Site Access

Construction site access will be from the N69 Dock Road. There is an existing track through the site that is connecting to the entrance road at a roundabout junction with the entrance to the Greyhound Stadium. The road will be raised to the correct alignment using compacted stone fill. At the early stages of construction, the access road may be constructed from unbound stone. The access road will be paved and completed, including street furniture, cycle ways and footpaths, in advance of occupation of the first phase of the development.

2.3.2 Site Establishment and Security

The first activity to be carried out at the site will be the establishment of site facilities and security. The site office and welfare facilities (site compound) will be confirmed in advance of the commencement of site works.

All the sub-contractors as well as the main contractor and project managers will occupy offices within the construction compound. The site parking for all staff, contractors and visitors will also be located in this area.

Erection of perimeter hoarding will take place at the start of the project alongside the site establishment and security works. The hoarding will be installed around the complete perimeter,

except for dedicated access points. The extent of hoarding will be subject to the detailed phasing of the development and will ensure that areas under construction will be fenced off at all times. Gates will be provided at the access points and will be locked outside of working hours. Hoarding will consist of solid painted plywood on a timber support frame or similar. Hoarding will be properly designed to be secure and durable and will be maintained until it can be dismantled on completion of the development (or phase of the development).

2.3.3 Lighting

Lighting will be provided as necessary at construction compounds. Consideration of best practice and guidance in relation to lighting and wildlife impact such as *Bats & Lighting Guidance Notes for Planners, engineers, architects and developers* (Bat conservation Ireland, December 2010); All lighting will be directional with appropriate cowling installed to minimise light spillage from the site. The height of lamp posts will be restricted (e.g. <8m where possible) to reduce the amount of light spillage where it is not needed. The lights will be positioned facing away from the Ballynaclogh River to the west where possible to minimize impact on bats that may use this area as a commuting route as well as other species who may use this habitat e.g. otters. Where possible all light fittings will be LED, have asymmetrical projection i.e. directional, and with colour temperature of 2700K (warm spectrum preferred by bats). The radiation will be above 500nm to avoid the blue or UV light, most disturbing to bats.

Construction work will generally be confined to daylight hours and lighting will generally not be required for the construction phase. There will however be occasions where the provision of portable lighting will be required such as evening work during later winter/early spring, works on roadways and power floating floors. Where possible and without jeopardising site safety, lights will be pointed down at a 45-degree angle and away from sensitive receptors. The site compound will have external lights for safety and security. This lighting will also be controlled by occupancy/motion sensors so that it will remain at a low output unless activated. This will mitigate light overspill as well as avoiding energy wastage. Construction stage lighting will be designed to minimise the broadcast of light to surrounding areas including sensitive receptors.

2.3.4 Site Clearance

To facilitate the earthworks operation, site clearance will have to be carried out to remove vegetation. Removal of woody vegetation shall only take place outside the bird breeding season (1st March to 31st August). No removal of habitats or movement of construction machinery will occur outside of the development works area/footprint during the construction phase. Existing trees and hedgerows shall be retained where possible. Temporary surface water management measures will be put in place prior to stripping of topsoil and will remain in place until the completion of the development, or until the completion of each phase. Refer to Section 3.1 below for details of the surface water management measures.

Topsoil will be stripped from the area to developed and from the area where site won fill is to be excavated to bring the development to the correct level. All excavated topsoil will be stored in dedicated stockpiles with environmental controls in place.

Prior to topsoil clearance, an Invasive Species Management Plan and survey is recommended to ensure areas of invasive plant species (if any) are identified and managed prior to or during site clearance works. There is a responsibility on the Environmental Manager or Ecological Clerk of Works (ECoW) to regularly inspect and supervise maintenance of the environmental controls throughout the process.

2.3.5 Earthworks

Once surface water management measures are in place and topsoil has been stripped, earthworks operations can commence. This will consist of moving fill from the higher ground at the east to the lower ground to the west. Material will be excavated by 360° excavators and transported to the deposition area by articulated dumpers. The fill will then be placed by dozers and compacted using vibratory rollers. A testing regime will be implemented to ensure the acceptability of the fill and that the degree of compaction is sufficient. Fill will be brought to the required level across the site to allow construction of roads and foundations. An overall earthworks balance has been targeted i.e. no imported fill will be required for the bulk earthworks and no soil will be removed from the site.

2.3.6 Construction of housing

On completion of the bulk earthworks, construction of foundations for housing will commence. The exact construction sequence has not been determined, but it will be similar to what is described below:

- Temporary roads will be constructed to provide access to each row of units. This will include the construction of surface water management and silt control infrastructure, including settlement ponds and silt fencing.
- Construction of foundations. It is envisaged that raft foundations will be used on this site. The locations of foundations will be set out on the ground. Importation of certified stone fill will be required for the layers under the foundations in compliance with the Building Regulations. Reinforcement will be fixed, formwork installed and all required ducting placed prior to placement of concrete. Construction of foundations will require concrete deliveries to the site. Controls will be required to prevent any concrete material reaching local watercourses.
- Once foundations have cured, timber frames will be delivered to site and erected, followed by roofs.
- Scaffolding will be erected and construction of the masonry/brick outer leaf will then be completed.
- Windows and doors will be installed and first fix plumbing and wiring will be completed prior to external and internal rendering.
- On completion of rendering, second fix, plumbing wiring and carpentry will be completed, followed by floors, painting and finishing.
- At this stage, installation of drainage and services is likely to progress and the roads will be completed. Drives, footpaths, boundary walls and lawns will be finished and final road pavements will be installed.

The construction of apartment blocks will generally follow the construction sequence outlined below:

- Installation of piles
- Construction of pile caps, foundations and ground floor
- Erection of steel or reinforced concrete frame
- Construction of floors and roof slab
- Facades
- Fit out

2.3.7 Landscaping

Landscaped areas will be completed at the same time as each phase. These areas will be brought to a level below the final grading and will be finished with reclaimed topsoil on completion. Seeding and planting will be in accordance with the landscape plan for the site. Refer to the Landscape Design Report prepared by Murray and Associates.

3 Environmental Management

3.1 Surface Water Management

The SHD site is located on a ridge of ground running roughly in an east-west direction. The high point of the site is at the eastern boundary with existing housing developments. The ground level is higher on the east side of the boundary, there is therefore no risk of surface water from the site affecting the existing developments. The ground falls away from the SHD site on both the north and south boundaries. The land to the north is in the same ownership and is the location of the old racecourse. The area is currently overgrown and is generally damp and low lying. The land to the south is in different ownership (Limerick City and County Council) and slopes gently down to the Ballynaclogh River. The Ballynaclogh River is located to the southwest of the SHD site. The land to the west of the SHD is in the same ownership and slopes gently towards the entrance.

The Ballynaclogh River is located to the south and west of the site. There is an existing network of drainage channels on the old racecourse to the north of the site, refer to Photo 3-2. Currently, surface water on the existing site either infiltrates naturally through the ground or by overland flow to the existing drainage network. The most sensitive parts of the site in relation to surface water will be:

- the southern boundary as it is in different ownership and because of the presence of the Ballynaclogh River.
- The existing drainage channels to the north of the site.

Photo 3-1: View from southern boundary of SHD site looking south towards Ballynaclogh River

Photo 3-2: Existing drain on old racecourse to the north of SHD site

Run-off into excavations/earthworks cannot be prevented entirely and is largely a function of prevailing weather conditions. Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. All run-off will be prevented from directly entering any water courses as no construction will be undertaken directly adjacent to open water.

No significant dewatering will be required during the construction phase which would result in the localised lowering of the water table. There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavations are kept safe and relatively dry.

The measures outlined in the following sections will be put in place during the construction phase to ensure protection of surface waterbodies. Construction works will be informed by best practice guidance from Inland Fisheries Ireland on the prevention of pollution during development projects. These measures comply with the following relevant CIRIA and Inland fisheries guidance documents:

- Control of Water Pollution from construction Sites, Guidance for consultants and contractors (C532)
- Environmental Good Practice on Site (3rd edition) (C692)
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016).

3.1.1 Pollution Control

3.1.1.1 Management of suspended solids in run-off

Prior to the commencement of topsoil stripping and earthworks operations, the following site-specific surface water management measures will be put in place:

1. Where possible, significant earthworks operations should be limited to the summer months.
2. Silt fencing will be installed around the perimeter of the site. The location of the silt fencing will be determined in the construction stage CEMP and will be subject to a detailed assessment of the area or phase to be developed. The purpose of the silt fencing is to prevent silt laden water leaving the site and entering neighbouring land with the potential to impact nearby watercourses. A typical silt fence detail is shown below in Figure 3-1. It will consist of a double layer of geotextile membrane fixed to wooden stakes approximately 600mm high. The membrane will be anchored into the ground to form a continuous barrier to silt laden water from the works site. Silt fences will be monitored via a silt inspection log (to be maintained by the Environmental Manager/ECoW) and periodically maintained during the construction period. Typical maintenance will consist of repairs to damaged sections of membrane and removal of a build-up of silt on the upslope side of the fence. Daily silt fence inspections are recommended as part of their operation ensuring that any necessary repairs can be expedited.

Figure 3-1 Silt Fencing (www.geosyn.co.uk)

3. Drainage ditches will be installed to intercept surface water where there is a risk of significant water flow into excavations or on to adjoining lands. There will also be a requirement to periodically pump water from excavations. All collected and pumped water will have to be treated prior to discharge. The run-off will be directed through appropriately sized settlement ponds to remove suspended solids. All treated water will then be directed to an existing constructed lagoon to the west of the site. The constructed lagoon was designed in

anticipation of the site being developed and was sized to receive and attenuate the operational surface water drainage. Discharge from the constructed wetland to the Ballynaclogh River is controlled by a penstock. The operational flow rates will be much greater, due to the increase in impermeable area. The constructed wetland will therefore be capable of dealing with runoff from the unpaved site during construction.

Figure 3-2 Multi-stage Settlement Pond (Scottish Renewables, 2019)

4. Emergency contact numbers for the Local Authority Environmental Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the site compound. These agencies will be notified immediately in the event of a pollution incident.
5. Site personnel will be trained in the importance of preventing pollution and the mitigation measures described here to ensure same.
6. The Environmental Manager or ECoW will be responsible for the implementation of these measures. They will be inspected on at least a daily basis for the duration of the works, and a record of these inspections will be maintained.
7. Any temporary storage of soil, hardcore, crushed concrete or similar material will be stored 50m from any surface water drains. All temporary storage areas should also have surface run-off controls in place to prevent migration of possible materials. There can be no direct pumping of silty water from the works directly to any watercourse. All water from excavations must be treated by infiltration over lands or via settlement areas, silt busters etc.

3.1.1.2 Flooding

The site is protected from flooding by existing embankments along the Ballynaclogh River and River Shannon. The risk of flooding during the construction period is therefore limited to an embankment breach scenario and then only during the bulk earthworks operations – once the earthworks are complete, the entire SHD site will be above the breach flood levels. An embankment breach is a catastrophic scenario with potential to cause widespread flooding, pollution and risk to life in the vicinity. The likelihood of flooding during the earthworks operations is extremely low. The nature of an embankment breach means that is impractical to provide silt management measures that could

remain operational during such an event. Protection of life and critical infrastructure will be the overriding concerns. The following measures will be required:

1. Stockpiles of soil shall be kept at the highest level possible within the site.
2. Silt fencing and settlement ponds shall be placed at the highest level possible within the site. Silt fences shall be inspected as part of the daily inspection regime. Trapped silt shall be removed from silt fencing at regular intervals.
3. Earthworks shall be left exposed for the minimum time possible. Earthworks formations shall be protected by a layer of imported granular fill.
4. Landscaping and seeding of the perimeter embankments and retaining structures in accordance with the Landscaping Plan shall be carried out as early as possible.
5. An Emergency Response plan shall be developed for the site and shall consider the following:
    a. Flood forecasting shall be used to determine the probability of the site being flooded.
    b. Emergency evacuation routes will be included in the plan to ensure that flooding does not threaten the safety of construction personnel and/or residents.
    c. Site compounds, fuel storage areas, generators and the like shall be sited as high as possible on the site.

3.1.1.3 Control of cement run-off

The washing out of concrete delivery vehicles is a potential source of pollution and shall be carried out in in designated wash out areas only.

Wash-out areas on site will be located greater than 50m from any natural watercourse and properly designed with an impermeable liner to contain all cement laden water. No wash-out of ready-mix concrete vehicles shall be located within 10 metres of any temporary or permanent drainage features. Signage shall be erected to clearly identify the wash-out areas. Sufficient wash-out areas shall be provided to cater for all vehicles at peak delivery times.

On-site batching of concrete is not envisaged, but ready to use mortar silos are often used for housing developments. These systems involve the delivery and storage of dry cement and aggregates in silos, water is added at the point of delivery to make mortar or plaster. The following controls shall be put in place for the on-site batching of concrete, mortar and render:

- The plant shall be maintained in good condition.
- Delivery of cement shall be means of a sealed system to prevent escape of cement.
- The plant shall be situated on a paved area at least 20m from any temporary or permanent drainage features.
- Emergency procedures shall be in place to deal with accidental spillages of cement or mortar.

Figure 3-3 Concrete wash-out area with impermeable liner (TII)

3.1.1.4 Accidental Spills and Leaks

No bulk chemicals will be stored within the active construction areas. Temporary oil and fuel storage tanks may be kept in the material storage area in suitable containers and will be stored on appropriately bunded spill pallets as required. Any fuel and oil stored onsite shall be stored on bunded spill pallets approved under BS EN 1992-3:2006). All bunds will be impermeable and capable of retaining a volume of equal to or greater than 1.1 times (>110%) capacity of the containers stored on them. In the event of a spillage, excess oil or fuel will be collected in the bund.

Refuelling of vehicles and the addition of hydraulic oils or lubricants to vehicles will be undertaken offsite where possible. Where this is not possible, filling and maintenance will take place in a designated material storage compound, which is located at least 10 metres from any temporary or permanent drainage features. Spill protection equipment such as absorbent mats, socks and sand will be available in clearly marked bins/silos and in construction vehicles to be used in the event of an accidental release during refuelling. Training will be given to site workers in how to manage a spill event.

The following mitigation measures will be taken at the construction site to prevent any spillages to ground of fuels during machinery activities and prevent any resulting soil and/or groundwater quality impacts:

- Refuelling will be undertaken off site where possible.
- Where mobile fuel bowsers are used the following measures will be taken:
    - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use.
    - Any pump or valve will be fitted with a lock and will be secured when not in use.
    - All bowsers to carry a spill kit and operatives must have spill response training; and
    - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.
    - Weekly checks of spill kits will be carried out to ensure they are sufficiently stocked.

3.1.1.5 Monitoring

Daily checks will be carried out and recorded in a Surface Water Management Log to ensure surface water drains are not blocked by silt, or other items, and that all storage is located the required distance from surface water receptors. A daily log of inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not reoccur.

3.2 Noise, Vibration and Dust Control

Construction of the development has the potential to create significantly increased noise and dust levels locally unless adequate controls are put in place. Earthworks operations will involve the use of heavy construction plant. Stockpiles of material and haul roads could become dusty in dry weather. Road and housing construction are also potential sources of noise and dust.

3.2.1 Noise

Specific noise abatement measures shall comply with the recommendations of BS5228-1 2009. These measures will include:

1. No plant used on site will be permitted to cause an ongoing public nuisance due to noise.
2. The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations.
3. All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract.
4. Compressors and generators will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
5. Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.
6. Any plant, such as generators or pumps, required to operate before 07:00hrs or after 19:00hrs will be surrounded by an acoustic enclosure or portable screen.
7. Location of plant shall consider the likely noise propagation to nearby sensitive receptors.

The earthworks will generate typical construction activity related noise and vibration sources from use of a variety of plant and machinery such as rock breakers (where required), excavators, lifting equipment, dumper trucks, compressors and generators. The noise levels shall comply with the mitigation measures and any planning conditions.

A designated noise liaison will be appointed to site during construction works. Any complaints will be logged and followed up in a prompt fashion. In addition, prior to particularly noisy construction activity, e.g. excavation close to a property, etc., the site contact will inform the nearest noise sensitive locations of the time and expected duration of the works.

All works on site shall comply with BS 5228 2009+ A1 2014 (Parts 1 & 2) which gives detailed guidance on the control of noise and vibration from construction activities. In general, the contractor shall implement the following mitigation measures during the proposed infrastructure works:

- Avoid unnecessary revving of engines and switch off equipment when not required.
- Keep internal haul roads well maintained and avoid steep gradients.
- Minimise drop height of materials.
- Start-up plant sequentially rather than all together

3.2.2 Vibration

Vibration limits to be applied for the infrastructure works will be those specified in the TII document Guidelines for the Treatment of Noise and Vibration in National Road Schemes (TII, Revision 1, 2004). These limits are outlined below:

Allowable Vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration shall comply with the mitigation measures and any planning conditions.

3.2.3 Dust

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design, planning and effective control strategies. The siting of construction activities and soil stockpiles will take note of the location of sensitive receptors and prevailing wind directions to minimise the potential for significant dust nuisance. In addition, good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or using effective control measures quickly before the potential for nuisance occurs.

- During working hours, technical staff (e.g. Environmental Manager/ECoW) will be available to monitor dust levels as appropriate; and
- At all times, the dust management procedures put in place will be strictly monitored and assessed.

The dust minimisation measures will be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust generation. In the event of dust nuisance occurring outside the site boundary, site activities will be

reviewed, and procedures implemented to rectify the problem. Dust levels shall comply with the mitigation measures and any planning conditions.

Specific dust control measures to be employed are presented below.

3.2.3.1 Site Routes

Site access routes (particularly unpaved areas) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions.

- A speed restriction of 15 km/hr will be applied as an effective control measure for dust for on-site vehicles or delivery vehicles within the vicinity of the site.
- Bowsers will be available during periods of dry weather throughout the construction period, with water sourced from the mains supply. The bowser will operate during dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use.
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced areas shall be restricted to essential site traffic only.

3.2.3.2 Demolition/Excavation

Demolition and excavation works during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust.
- During periods of very high winds (gales), activities likely to generate significant dust emissions will be postponed until the gale has subsided. The movement of truck containing materials with a potential for dust generation to an off-site location will be enclosed or covered.

3.2.3.3 Stockpiling

The location and moisture content of stockpiles are important factors which determine their potential for dust emissions. The following measures will be put in place:

- Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible.
- Regular watering will take place during dry/windy periods to ensure the moisture content is high enough to increase the stability of the soil and suppress dust.
- Permanent or long-term stockpiles of topsoil shall be seeded to limit dust emission.

3.2.4 Site Traffic

Spillage and blow-off of debris, aggregates and fine material onto public roads will be reduced to a minimum by employing the following measures:

- Vehicles delivering material with potential for dust emissions to an off-site location shall be enclosed or covered at all times to restrict the escape of dust.
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.
- A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate.
- Road sweepers will be employed to clean the site access route as required.

Due to potential phasing of the project, there may be some parts of the development occupied while construction continues on other parts of the site. The following strategy will be employed to ensure that construction traffic does not impact negatively on residents:

- Once the first phase has been completed and units are occupied, construction traffic will be segregated from completed estate roads as much as possible. This will minimise the interaction between construction operations and the residents. This process will be repeated for subsequent phases.
- All roads and footpaths used by residents will be paved and regularly maintained and cleaned.
- Solid painted hoarding will be installed between completed phases and those under construction. Hoarding will be maintained in good order.
- Site compounds will generally be moved away from completed phases to subsequent phases.

3.3 Biodiversity and Invasive Species Management

All site-specific mitigation measures shall be adopted to ensure the protection of biodiversity during the construction works. In the unlikely event that invasive species be discovered on site that were not identified in the EIAR, a detailed management plan shall be developed.

3.4 Consents and Licenses

All statutory consents and licences required to commence on-site construction activities will be obtained ahead of works commencing, allowing for the appropriate notice period. These will include, but are not limited to:

- Site notices
- Construction commencement notices
- Licence to connect to existing utilities and mains sewers, where required

3.5 Services and Utilities

Welfare facilities (canteens, toilets etc.) will be available within the construction compound and this will remain in place for the construction of the proposed development. The offices and site amenities

will initially need to have their own power supply, water deliveries and foul water collection until connections are made to the mains networks.

Electrical connections will be made by suitably qualified personnel following consultation with the relevant authorities and will be cognisant of subsequent construction works. High voltage connections will be established for heavy duty equipment and site facilities, as required. The current electricity facilities on the site of the proposed development are supplied by the ESB through a ring network. All electrical works, including connection to the ESB network will be carried out by a suitably qualified contractor.

Water supply required for welfare facilities, dust suppression and general construction activities will be sourced from the existing public piped supplies running into the site, in consultation with Irish Water.

As with electrical works, this will be carried out by a suitably qualified contractor. It will be necessary to service the site with a reliable and safe water supply. Site welfare facilities will be established to provide sanitary facilities for construction workers on site. The Contractor will ensure that sufficient facilities are always available to accommodate the number of employees on site. Foul water from the offices and welfare facilities on the site will discharge into the existing sewer on site (the cabins may initially need to have the foul water collected by a licensed waste sewerage contractor before connection to the sewer line can be made)

3.6 Material Handling, Storage and Delivery

The Contractor will ensure that the delivery of materials is coordinated to minimise impacts to adjacent properties. The Contractor will ensure that all materials are adequately stored and secured in their site compound. The Contractor will ensure the roads adjacent to the site are kept clean and free of debris.

It is proposed to source general construction materials from the local area to minimise transportation distances (subject to suitable material costs). Where possible 'Just in Time' delivery system will operate to minimise storage of materials on-site.

Aggregate materials such as sands and gravels will be stored in clearly marked areas in the compound area. Liquid materials will be stored within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications – BS EN 1992-3:2006) to prevent spillage.

Construction materials will be brought to site by road from the N69 entrance. Construction materials will be transported in clean vehicles. Lorries/trucks will be properly enclosed or covered during transportation of friable construction materials and spoil to prevent the escape material along the public roadway.

The majority of construction materials generated will be soil from excavation works, but it is planned to reuse all excavated soil on site and achieve a cut-fill balance. Movement of spoil and soil will be carried out in accordance with the recommendations detailed in the Invasive Species Management

Plan for the site to prevent the inadvertent spread of invasive species within the site itself and off site to other areas.

3.7 Visitor Management

Visitors will only be allowed to enter the main site compound via the designated pedestrian access gate. A dedicated, secured footpath to the site office is established at the gate for registration and obtaining PPE prior to entering the site. A log will be maintained by security to control access to the site. Visitors will be required to attend a site-specific induction to allow access to the compound and/or construction site unless being accompanied by an inducted member of the site team. Visitors will then be taken by an inducted member of the construction team to the required area of the site.

3.8 Site Working Hours

The proposed hours of work on site will be stipulated in the planning conditions attached to the planning grant. Any working hours outside the normal construction working hours will be agreed with the planning authority. The planning of such works will take consideration of sensitive receptors.

3.9 Employment and Management Workforce

Construction employment numbers will vary depending on the construction stage of the project and the actual approach adopted by the Main Contractor. However, it is anticipated that at the peak of construction there will be a workforce varying in a range of approximately 70-100 people employed depending on phasing and stage of construction.

Initial stages of construction such as site clearance will be limited to specific disciplines which will not require large numbers of personnel. However, multiple trades may be active on the buildings during internal fit-out of the completed structures on a staggered basis as the works are progressed leading to higher numbers of personnel being present.

It is estimated that there will initially be 15-30 staff on site on a typical day, however during peak construction periods this is expected to fluctuate up to 70-100 staff and contractors on site per day. It is anticipated that the key project managers and main contractor representatives will maintain a presence on site for the whole duration of the project and the labour workforce will be determined by the specialist contractors required on site.

All employees working on the site will be required to have a SafePass Card (or similar approved Construction Health & Safety card), manual handling training, CIF COVID 19 training and the necessary certificates to operate machinery as required. The details of training required, records maintained, and induction procedures will be outlined in the Main Contractor's Health and Safety Plan(s).

3.10 Communications with Local Stakeholder Management

The Developer will, as required, liaise with owners of local properties in advance of works commencing onsite and coordinate works to have minimum impact on the operation of local properties. All signage used will meet the requirements of the Safety, Health & Welfare at Work (General Applications) Regulations 2007 and Chapter 8 Traffic Signs Manual.

3.11 Preliminary Traffic Management Plan

A Traffic Management Plan (TMP) will be prepared for the site works in accordance with the principles outlined below and shall comply with the requirements of:

- Department of Transport Traffic Signs Manual 2010 – Chapter 8 Temporary Traffic Measures and Signs for Roadworks
- Department of Transport Guidance for the Control and Management of Traffic at Road Works (2010)
- Any additional requirements detailed in the Design Manual for Roads and Bridges (DMRB) & Design Manual for Urban Roads & Streets (DMURS)

The Contractor shall prepare a detailed traffic management plan for works at that interface with the existing road network and obtain all required road opening licenses. Access for construction of the development will be via the proposed primary access for the development from the Dock Road.

The earthworks plan has been developed to ensure an earthworks balance on site. Excavated material will be reused as part of the site development works where possible to minimise HGV movements to and from the site via the Dock Road.

3.12 Waste Management

This section outlines the measures that will be undertaken to minimise the quantity of waste produced at the site and the measures to handle the waste in such a manner as to minimise the effects on the environment. A site-specific Construction Waste Management Plan (WMP) has been prepared and will be employed to ensure sustainable and effective waste management throughout the construction and demolition phases of the project.

Adherence to the WMP prepared for the construction works will ensure that the management of waste arising is dealt with in compliance with the provisions of the Waste Management Acts 1996 – 2015 and amendments. The waste management hierarchy to be adopted will be as follows:

1. Prevention and Minimisation
2. Reuse of Waste
3. Recycling of Waste:
4. Disposal

Typical waste materials that will be generated from the demolition and construction works will include:

- Soil and stones
- Concrete, bricks, tiles and ceramics
- Wood, glass and plastics
- Metals
- Gypsum-based construction material
- Paper and cardboard
- Mixed C&D waste
- Chemicals (solvents, paints, adhesives, detergents etc.)

The management of all hazardous waste arisings, if they occur, shall be coordinated in liaison with Health and Safety Management.

3.12.1.1 Waste Minimisation

Waste minimisation measures proposed are summarised as follows (and are described in more detail in the CWMP):

- Materials will be ordered on an 'as needed' basis to prevent over supply.
- Materials will be correctly stored and handled to minimise the generation of damaged materials.
- Materials will be ordered in appropriate sequence to minimise materials stored on site.
- A waste tracking log will be established.
- Sub-contractors will be responsible for similarly managing their wastes.
- All wood waste generated by site works will be inspected and examined and will be segregated as re-useable wood and scrap wood waste.

3.12.1.2 Waste Storage

The main waste storage area will be located in the site compound A dedicated and secure area containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the development.

Waste materials generated will be segregated at the site compound, where it is practical to do so. Where the on-site segregation of certain waste types is not practical, offsite segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source. All waste receptacles leaving site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled.

The site Construction Manager will ensure that all staff are informed of the requirements for segregation of waste materials by means of clear signage and verbal instruction. Appointed employees will be made responsible for ensuring good site housekeeping.

3.12.1.3 Records

A written record of all quantities and nature of wastes removed from the site will be maintained on-site in a waste file (in hardcopy or electronically).

It is the responsibility of the project manager or his/her delegate that all contracted waste haulage drivers hold an appropriate waste collection permit for the transport of waste loads and that all waste materials are delivered to an appropriately licenced or permitted waste facility in compliance with the relevant Regulations as outlined in the CWMP.

The Contractor, as part of regular site inspection audits, will determine the effectiveness of the waste management strategy and will assist the project manager in determining the best methods for waste minimisation, reduction, re-use, recycling and disposal as the construction phase progresses and waste materials are generated.

3.12.1.4 Invasive Species Management

No plant species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (i.e. species of which it is a legal offense to disperse, spread or otherwise cause to grow in any place) or classified as a 'risk of high impact invasive species' (Kelly et al. 2013) were recorded within the study site. In total five non-native invasive plant species were recorded during the 2020 habitat survey including:

- Himalayan honeysuckle (*Leycesteria formosa)*
- Fuchsia *(Fuchsia magellanica)*
- Buddleia (*Buddleja davidii)*
- Travellers Joy *(Clematis vitalba)*
- Montbretia *(Crocosmia pottsii x aurea = C. x crocosmiiflora)*
- Sycamore (*Acer pseudoplatanus*)

Himalayan honeysuckle, Travellers Joy and Buddleia are classified as a 'risk of medium impact invasive species' (Kelly *et al.* 2013) but not listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011. Fuchsia and Montbretia are not yet classified.

Construction works within the proposed works areas can potentially disturb stands of invasive plants and/or soils contaminated with invasive plant material. In addition to lands within the proposed works areas, there is an identified risk of invasive plant species being spread onto neighbouring lands and onto public roads and other locations. Construction works could therefore result in the spread of invasive plant species both in-situ and ex-situ. The following measures are proposed to prevent the inadvertent spread of invasive plant species:

(i) The Contractor will prepare an Invasive Alien Species (IAS) Management Plan for the works. The Plan must be clearly communicated to all site staff and must be adhered to if it is to be implemented successfully.

(ii) Prior to the development works and landscaping activity begins an updated survey by an appropriately experienced ecologist will be carried out to establish the full extents of the invasive plant species within the proposed development site boundary.

(iii) In accordance with the TII guidance this survey will produce accurate 1:5,000 scale mapping for the precise location of invasive species. The pre-construction surveys will be undertaken by suitable ecologists with competence in identifying the species concerned having regard to any seasonal constraint.

(iv) Areas of invasive species will be fenced off and signage installed where no works will take place within this area until such time as they can be eradicated/managed.

(v) The invasive species will be appropriately managed (aiming for eradication) prior to any vegetation clearance works occurring where these species were identified.

The best available methods of control and eradication refer to the NRA Guidelines (2010) and Fennell *et al*. (2018). It is recommended that a suitably experienced contractor is employed to undertake the invasive species eradication programme at the site. Several approaches are available for the control of invasive plant species consisting of chemical control, physical control or a combination of both. For example, manual control may only work for small, new infestations such as young Buddleia shrubs, but a combination of manual and chemical control may be required to ensure the complete eradication of more established shrubs. The specialist contractor will advise/finalise the best approach based on their knowledge of the species in question.

4 Roles and Responsibilities

4.1 Construction Manager

The Construction Manager will have overall responsibility for the site during the construction phase. This will include implementation of the CEMP. The Construction Manager shall:

- Manage all construction staff and subcontractors to ensure the requirements of the CEMP, planning permission and all legislative requirements are complied with.
- Cooperate with the Environmental Manager to ensure that the do not pose an environmental risk.
- Ensure all monitoring plans are maintained throughout the construction phase.
- Be responsible for implementing all response plans and notifying relevant bodies of any incidents.

4.2 Environmental Manager/ECoW

The Environmental Manager will be responsible for all environmental monitoring during the construction phase. The duties of the Environmental Manager are summarised as follows:

- Carry out (or manage) all environmental monitoring and maintain auditable logs of all environmental requirements.
- Liaise with statutory bodies in relation to environmental issues.
- Prepare regular environmental reports and maintain the CEMP.

- Carry out environmental site audits to ensure the works are carried out in accordance with the CEMP. Advise the Construction Manager of non-conformances and areas for improvement.
- Review the Contractor's method statements with respect to environmental issues.
- Monitor compliance with the mitigation measures and any planning conditions relating to the environment.
- Assist the Construction Manager in the notification and investigation of all environmental incidents.
- Act as a point of contact to allow all site staff to take responsibility for and report environmental issues.
- Provide education and toolbox talks for all site staff and maintain an Environmental Notice Board.

5 Conclusion

This CEMP sets out the overall management strategy for construction works for the proposed development. The CEMP aims to ensure the management of construction activity is carried out in a planned, structured and considerate manner which minimises the impacts of the works on the local environment, residents and commercial activities in the vicinity of the site. Due to the nature of construction works, there may be unforeseen events which occur at the site and the project team will actively manage any changes and discuss with the relevant authorities, where required. The project team are committed to ensuring that the construction activities to be carried out are pro-actively managed to minimise potential impacts.

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