Kilcross Road,
Sandyford,
Dublin 18.

Construction Environmental Management Plan (CEMP)

February 2024

REPORT CONTROL

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Primary Author:	**Gearoid Kirwan**	**Signed:**	Gearoid Kirwan
Reviewed By:	Brian Byrne	Signed:	
Authorised By:	Brian Byrne	Signed:	

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This Construction Environmental Management Plan (CEMP) is for the works associated with the construction of the proposed Sonas Refuge development at Kilcross Road, Sandyford, Dublin 18, as indicated in Figure 1 below. The CEMP issues addressed in this plan include noise and vibration, traffic management, working hours, pollution control, archaeology, arboriculture, dust control, road cleaning, compound / public health facilities and staff parking.

Figure 1 - Site Location

1.1 The Proposed Development

The proposed development consists of 2 short stay residential buildings comprising of 12 residential units and a communal building on a 0.2 hectare site (site ownership, plus a 0.05 hectare way leave).

Refer to RDF architects' drawing '24-001-P-010 Site Layout Plan' for the proposed site layout.

2 Construction and Site Logistics

2.1 Construction Programme & Working Hours

The development is expected to start in Q4 2024 and take approximately 40 weeks. It should be noted that the rate of progress is predominantly influenced by market conditions. Consequently, the timeframes outlined here may be subject to significant fluctuations.

It is proposed that Construction works will be carried out between the hours of 08:00 and 18:00 from Monday to Friday and 08:00 and 14:00 on Saturdays.
No construction works will be carried out on Sundays or Bank Holidays, without the specific agreement of Dun Laoghaire-Rathdown County Council.

Workings hours will be confirmed by Dun Laoghaire-Rathdown County Council.

2.2 Training & Awareness

All personnel working on the site must complete an induction before initiating any tasks. The main contractor will provide the specifics of the site induction in the Construction Health & Safety Plan.

During the site induction, all staff members will be informed about the sensitive ecological areas near the site if any. They will also be educated on the risks related to stormwater runoff and soakaways on site and will be obliged to prevent any runoff or chemicals from entering channels or gullies if any.

Throughout the project, the Site Manager or Project Environmental Manager will conduct targeted talks, addressing potential environmental and safety hazards relevant to the specific stage of the project.

2.3 Pre-Construction Surveys

While topographical and utility evaluations have been completed for the site, the onus remains on the contractor to carry out their own site investigation prior to commencing any work. They are solely responsible for locating and securing all existing services in and around the intended site boundary.

Furthermore, the contractor is required to perform a pre-photographic and visual survey of the site, encompassing all boundary perimeters. Any damages inflicted on existing boundaries or features meant for preservation must be repaired by the contractor, in accordance with the relevant standards.

2.4 Construction Compound and Storage Areas

The development's construction compound will be situated within the domain of the proposed development. This compound will encompass a site office and amenities for the construction workforce. Initially, portable toilets will be available in the compound, with a dedicated restroom facility being installed at a later time. A licensed contractor will regularly empty the

toilet facilities. Both electrical and potable water supply will be derived from existing connections. Car parking can be found adjacent to the construction compound, as indicated.

Waste disposal containers will be placed near the site office. As needed, containers and skips designated for handling construction waste will be relocated closer to the work area. Construction materials arriving at the site will be unloaded and stored in the designated materials compound.

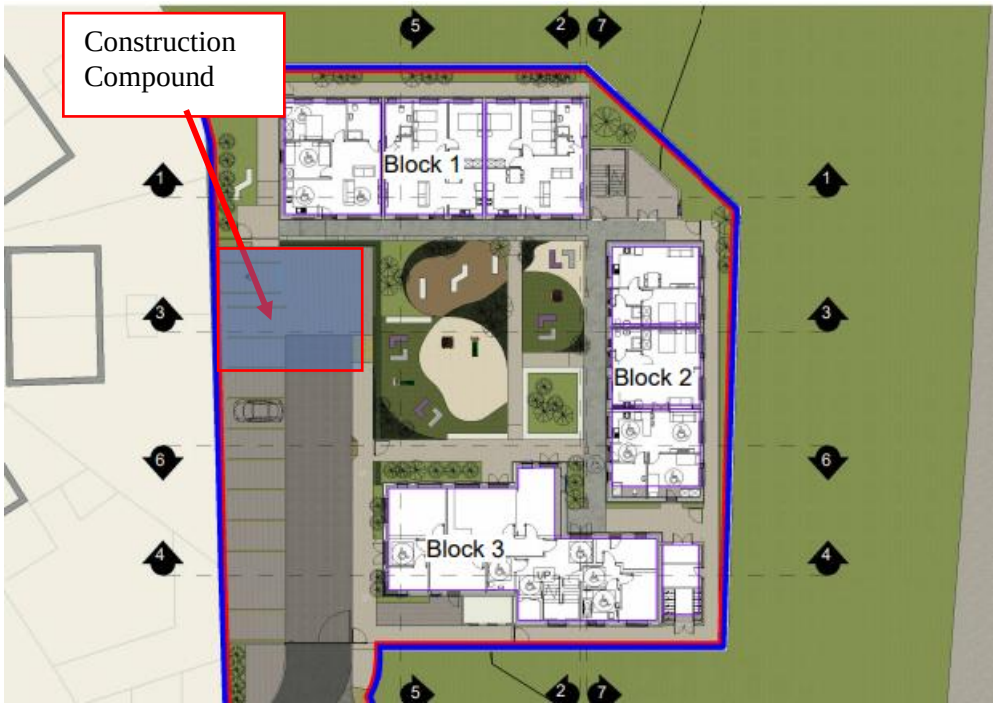

Figure 2 - Construction Compound Location

2.5 Site access and Security

Entry and exit from the construction site will be facilitated through the site entrance on Kilcross Road. Adequate space will be available for construction vehicles to access the site for material delivery and waste pickup without causing obstructions on the public road network.

Signs will be placed on Kilcross Road and the R117 (in both directions) to alert motorists of the ongoing construction activities. Vehicles entering and leaving the site will utilise the dedicated entrance off Kilcross Road. Signage at the site entrance will be installed to prevent the public from mistakenly accessing the site road. All vehicular access routes will be laid out in accordance with the requirements of chapter 8 of the Traffic Signs Manual.

At all times, the site will be secured with temporary fencing or hoarding to separate the ongoing construction work from the public. Any fencing employed will have netting attached to contain debris and dust, as well as provide visual screening of the construction activities. A secure, lockable gate will be installed at the site entrance, and visitors to the site will be directed to the adjacent site office. The Site management team will carry out frequent inspections and proactive maintenance of the security fencing and hoarding.

2.6 Oil & Fuel storage

To the extent possible, refuelling of vehicles and equipment will be avoided on site to reduce the likelihood of spills or leaks. Nonetheless, some fuel, lubricants, and hydraulic fluids must be stored on site during construction activities for machinery such as excavators and generators.

Refuelling and lubrication of equipment will be conducted exclusively in a designated area on the site, situated away from existing manholes or drainage channels. Currently, it is planned that fuel and lubricants will be stored near the office compound. Fuels and oils will be housed within a bunded enclosure with the capacity to hold 110% of the largest container or tank's storage volume. This bunded area will be suitably roofed to prevent rainwater infiltration.

The fuel storage zone will be securely protected against unauthorised entry or vandalism, and all nozzles will be locked when not in use. Spill kits and drip trays will be employed during refuelling to capture any potential spills or overflows. Vehicles or containers will not be left unattended while refuelling.

Mobile fuel dispensers may be utilised for refuelling heavy machinery. These dispensers will feature a double-skinned design, and spill kit or drip tray equipment will be used during refuelling. Refuelling will take place away from any nearby drains, watercourses, or surface water drainage channels.

2.7 Environmental Incident Protocols

Spill kits will be readily accessible on site, marked with clear signage for use in case of an environmental spill or leak. A spill kit will be stationed near the fuel storage area to address any incidents during refuelling or maintenance activities. Heavy machinery on site will also be outfitted with individual spill kits.

Should an environmental incident occur, the designated Project Environmental Manager must be informed promptly, and absorbent materials employed to halt the spill or leak's spread. Contaminated materials will be moved to leak-proof storage receptacles, and any tainted soils or gravels will be excavated and transported off-site. An incident log will be maintained, and Dun Laoghaire County Council will be notified accordingly.

2.8 Siteworks

The proposed sequence of constructing key components is subject to a thorough review by the Contractor during the construction phase, generally encompassing the following steps:

- Site preparation
- Termination of services and verification of any utilities on site by service providers
- Establishment of temporary power, lighting, and water services
- Installation of site accommodations and welfare facilities
- Identification of potentially hazardous materials on site
- Allocation of exclusion zones for demolition and dismantling
- Site clearance and demolition
- Earthworks, including excavation and backfill, as well as off-site disposal of surplus materials
- External site works and infrastructure development
- Construction of the substructure and hardstand areas
- Erection of the superstructure

2.9 Enabling Works

2.9.1 Demolition

Demolition works are not required on the site.

2.10 Earthworks

The design of the development aims to tie into existing levels at the boundary on the west, to avoid disruption to neighbouring properties and to prevent damage to the existing pipes along the western boundary.
A combination of cut and fill becomes necessary to achieve level access to buildings in accordance with Part M building regulations. Minimal fill will be required due to the design of the development and the topography of the site. Cut is necessary and will be essential during foundation excavation. A net export of materials is required to attain the required site formation levels.

Assuming that all cut material will be suitable for fill is rather optimistic. In reality, a portion of the cut material may be unsuitable. The proportion of material appropriate for reuse can only be estimated until actual construction commences. The European Waste Codes and EPA offer published estimates of various waste types comprising the entire waste stream. The project employs these estimates, which suggest a 75% reuse/recovery rate (equivalent to cut-to-fill) for the "soil and stones" category of the overall tonnage excavated.

Further optimisation may be achievable during subsequent design phases and throughout the construction process.

2.10.1 Soil Excavation Management

Site earthwork tasks, including clearing, stripping, excavation, trenching, backfilling, levelling, and compaction, will be necessary components of the project.

- Appropriate soils for engineered fills will be repurposed within the site to satisfy the cut-to-fill requirements of the design levels as discussed above. Soils unsuitable for engineered fill will be reused on site as backfill in grassy areas, if feasible. Surplus cut material that cannot be reused on site will be transported off-site under stringent controls.

- Contractors must submit and comply with a method statement outlining the affected areas' scope and demonstrating that the disturbance is minimal and achieves the desired results.

- Temporary soil storage and stockpiles will be carefully managed to prevent any negative impacts on the surrounding environment, ensuring storage away from open surface water drains. Soil storage within 30 meters of open water will be prohibited when adequate working areas are available within the site boundaries, adhering to Inland Fisheries Ireland guidelines.

- Material movement will be minimized to reduce natural ground disturbance, soil structure degradation, and dust generation.

- While no historical contamination evidence exists in the proposed development area, all excavated materials will undergo visual inspection for potential contamination signs, such as staining or potent odours. If any unusual staining or odour is detected, soil samples will be analysed for possible contaminants to confirm no historical pollution. If any excavated soil is found to be contaminated, a licensed waste disposal contractor will dispose of it.

To protect overburden material from wind exposure, storage will occur in sheltered areas of the site, when possible.

2.10.2 Origin of Fill and Aggregates

All fill and aggregate materials for the planned development will be procured from reliable, licensed suppliers. At the very least, every supplier must:

• Supply certificates of compliance or declarations of conformity for the specified material classes associated with the proposed development;
• Offer evidence of a satisfactory environmental management standing; and
• Present documentation confirming the company's regulatory and legal compliance status.

2.11 Construction Waste

2.11.1 Waste Categories

The expected construction and demolition waste quantities that will be generated throughout the course of the development are described in the tables below.

The calculated construction waste tonnage with the exception of soils and stones has been derived from the Building Research Establishment Environmental Assessment Method (BREEAM) which specifies that 11.1 tonnes of construction waste is generated for every 100m^2 of development area.

Construction and Demolition Waste falls under Chapter 17 of the European Waste Catalogue. The hazardous and non-hazardous waste streams likely to potentially arise and associated List of Waste (LoW) codes are presented in Table 1 below.

LoW Code	Description
17 01 01	Concrete
17 01 02	Brick
17 01 03	Tiles and Ceramics
17 01 07	Mix of concrete, brick, tiles, ceramics
17 02 01	Wood
17 02 02	Glass
17 02 03	Plastic
17 03 02	Bituminous Material
17 04 01	Copper, Bronze, Brass
17 04 02	Aluminium
17 04 03	Lead
17 04 04	Zinc
17 04 05	Iron and Steel
17 04 06	Tin
17 04 07	Mixed Metals
17 04 11	Cables
17 05 04	Soil and Stone
17 06 04	Insulation Material
17 08 02	Gypsum
17 09 04	Mixed C&D Waste
17 01 06*	Mix of concrete, bricks tiles containing hazardous substances
17 02 04*	Glass, Plastic and Wood containing hazardous substances
17 03 01*	Bituminous mixtures containing coal tar
17 05 03*	Soils and Stones containing hazardous substances
17 04 09*	Metal waste containing hazardous substances

Table 1 – Waste Categories

2.11.2 Predicted Waste Generation

The typical breakdown of construction waste generated on Irish sites taken from the EPA website based on 2021 figures (latest) is presented in Table 2 below:

EPA Data 2021

Waste Category	Recycling	Energy recovery	Backfilling	Disposal	Total
Metal	100	0	0	0	100
Segragated wood, paper, glass & plastic	77	21	1	1	100
Concrete, brick, tile & gypsum	45	0	52	3	100
Bituminous mixtures	49	2	40	9	100
Mixed C&D waste	0	0	72	28	100
Waste soils, stones and dredging spoils	0	0	94	6	100

Table 2 - Breakdown of Construction Waste as per EPA data

Based on a combination of the BREAAM predicted waste arisings and EPA statistical data, the total construction waste expected (excluding soils and stones) is 281 tonnes. The figure is split out in Table 3 below (excluding soil and stones).

Waste Type	Recycling		Energy recovery		Backfilling/Reuse		Disposal		Total
	%	Tonnes	%	Tonnes	%	Tonnes	%	Tonnes	
Metal	100	53	0	0	0	0	0	0	53
Segregated wood, paper, glass & plastic	77	6	21	2	1	0	1	0	8
Concrete, brick, tile & gypsum	45	57	0	0	52	66	3	4	126
Bituminous mixtures	49	9	2	0	40	8	9	2	19
Mixed C&D waste	0	0	0	0	72	54	28	21	75
Total	**44**	**125**	**1**	**2**	**45**	**128**	**9**	**27**	**281**

Table 3 - Outline Waste Quantities Likely to be Generated

Topsoil				
Item	**Excavate (m^3)**	**Reuse (m^3)**	**Export (m^3)**	**Import (m^3)**
Topsoil Strip	380			
Topsoil Reuse		30		
Topsoil Surplus for Export			350	
Subsoil				
Item	**Excavate (m^3)**	**Reuse (m^3)**	**Export (m^3)**	**Import (m^3)**
Subsoil – Site Levelling, Roads & Buildings	1770			
Subsoil Services & Attenuation	190			
Total	2020	50	1970	

Table 4 – Estimated Waste Arising from Excavation

It should be noted that until final materials and detailed construction methodologies have been confirmed, it is difficult to accurately predict construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

3 Health and Safety

The main contractor is obligated to establish a best practice work environment for all employees involved in the construction of the proposed development, considering all relevant statutory laws and guidelines. All construction activities will adhere to the Safety, Health and Welfare at Work (Construction) Regulations 2013. The main contractor must prepare a Construction Health & Safety Plan before initiating construction activities.

In case of an emergency at the site, the following procedures will be implemented:

- Emergency services will be contacted immediately by dialling 112 or 999.
- The caller will provide precise details of the emergency/incident to the emergency line operator, enabling them to evaluate the situation and respond appropriately.
- The Site Manager will be informed of the emergency.
- Trained site first-aiders, if available, will attend to the incident.
- The Site Manager will maintain communication with emergency services, ensuring they have accurate directions to the site.

If an incident occurs that does not require emergency services, any injured individuals will be transported to the nearest hospital by the Site Manager or another appointed person.

The closest Accident and emergency department to the site is:

- Beacon Hospital, Bracken road, Sandyford Business Park, Dublin 18, North of site, Via R117
- Phone No. – (01) 293 6600
- Driving Time – approx. 4 minutes

Minimum PPE required during construction works includes protective footwear, high-visibility vests, gloves, safety glasses, and hard hats. Ear defenders will be utilized during noisy tasks, as needed and will be provided at the site compound.

Additional details will be outlined in the Construction Health & Safety Plan, prepared by the appointed main contractor.

Figure 3 - Health and Safety sign

4 Construction Traffic Management

4.1 Haul & Delivery Routes

The majority of construction traffic arriving at and departing from the site will utilize the M50 and the R117. Several quarries are situated to the West (Belgard quarry), southwest (Kilsaran) and East (JW Carnegie & Co,) of the proposed site. Transportation of construction materials will make up the majority of HGV traffic movements during the construction process. Likewise, the contractor must employ licensed and permitted waste management facilities within the Eastern-Midlands Waste Management Region 2015-2021 capable of accepting Construction and Demolition (C&D) waste generated from the site.

The appointed contractor will identify the facilities supplying construction materials and handling waste collection from the site. Authorised waste contractors will be appointed to transport any waste off-site. Construction traffic, delivering or collecting materials from the site, will access the site from Kilcross Road (from R117) and turn within the site to prevent traffic congestion on nearby roads. Drivers will be informed of the site's working hours, and suppliers will be prohibited from parking at the site entrance while waiting for gates to open.

The south boundary of the site can be accessed by Kilcross road, which joins to the R117 regional road which connects the towns of Enniskerry and Dundrum. The Western boundary of the site is bound by the Residential properties within the Kilcross estate.

4.2 Construction Traffic Mitigation Measures

The key to efficient material/plant dispatches will be the effective organisation and coordination of all dispatches. They will be arranged so as to avoid queues of vehicles negatively impacting traffic flow and to reduce disruption to local traffic, especially on the R117. Dispatches will be scheduled and co-ordinated to steer clear of clashes with waste collection, other dispatches, and rush hour traffic. Large dispatches will be scheduled outside peak hours to lessen disruption. The construction firm will consider out of hours dispatches and collections to enable the smooth progression of works and reduce disruption. During the project procurement phase, the construction firm will generate a timetable of dispatches, adopting a 'just in time' approach to prevent potential conflicts and unnecessary storage and handling. All deliveries will take place within the site boundary.

During the construction stage, there will be a noticeable increase in HGV traffic on the road network as waste materials are removed from the site and deliveries arrive. However, this activity will be short-lived and generally staggered. Parking for construction staff will be available within the site boundary, and no parking will be permitted outside this area.

A permanent Gateman will be stationed at the entrance to ensure public safety from vehicles entering and leaving the site, as well as managing deliveries.

4.3 Construction Traffic Dust and Debris Management

Periodic visual surveys of the road network near the site will be conducted. The main contractor will perform road sweeping operations for approaching roadways using a suction sweeper or a similar suitable method to remove any site-related dirt or material deposited on the roads by construction or delivery vehicles. Hosing down of the access roads is also an option during periods of dry weather. The contractor must also provide adequate hard standing within the site

boundary off the main access to minimise spoil transfer onto public roads. Nevertheless, a wheel wash for construction vehicles leaving the site will be established in case debris deposition on the road becomes a risk. The Gateman will also be equipped with a yard brush to clean up any debris that has been fallen onto the public road and to keep the areas around the site entrance clean.

Waste collection vehicles leaving the site must cover their loads with a canvas to prevent waste or dust emissions from the vehicle on the road network.

4.4 Construction Traffic Safety Management

Key considerations for on-site traffic management include:

- Separating pedestrians and vehicles
- Reducing vehicle movements
- Managing personnel on site
- Facilitating vehicle turns
- Ensuring visibility
- Providing clear signs and instructions

Accidents can occur at any stage of construction, from groundwork to finishing, posing risks to managers, workers, site visitors, and the general public. Many construction vehicle accidents stem from inadequate planning and control.

Maintaining separation between pedestrians and vehicles is vital. The majority of construction transport accidents arise from insufficient separation between pedestrians and vehicles. Through careful planning, particularly at the design phase, and controlling vehicle operations during construction, such issues can be mitigated.

The following measures will assist in keeping pedestrians and vehicles separate:

- Entrances and Exits - The contractor will establish distinct entry and exit points for pedestrians and vehicles, with an attending gate person coordinating with the traffic and public to ensure safe vehicle movements.
- Walkways - The company will provide firm, level, and well-drained pedestrian walkways.
- Crossings - The firm will set up clearly marked and illuminated crossing points where walkways intersect with roads, ensuring clear visibility for both drivers and pedestrians.
- Visibility - The firm will ensure drivers have clear visibility in both directions before entering public roads.
- Obstructions - Walkways will not be obstructed to prevent pedestrians from stepping onto the vehicle route.
- Barriers - The firm will erect barriers between roadways and walkways.

On-site personnel management will be a priority, with measures in place to ensure workers are physically fit and competent to operate vehicles, machines, and attachments. This will include:

- Background checks during recruitment or contractor hiring;

- Driver and operator training;

- Management of visiting drivers.
- Those directing vehicle movements will be trained and authorised.
- Aids for drivers, such as mirrors, CCTV cameras, and reversing alarms will be provided, enabling all-around visibility. Gate personnel will be appointed and trained to control vehicle manoeuvres.
- The site will be adequately lit to enable clear visibility for drivers and pedestrians sharing routes, particularly after sunset or in poor weather conditions. On-site pedestrians will be required to wear high visibility clothing.
- The contractor will ensure that all drivers and pedestrians are aware of and understand the on-site routes and traffic regulations, using standard road signs where applicable.
- Induction training will be provided for drivers, workers, and visitors, and visitors will receive instructions prior to their visit. The firm will ensure all drivers and supply chain personnel are competent and possess the necessary training and certification for their roles.

5 Environmental Objectives & Targets

The primary environmental goals for the construction phase of the proposed development include:

- Safeguarding soil and water quality at the site, preventing any degradation caused by construction activities; and
- Minimising the impact on local residents and road users due to construction activity

Regarding waste management, a target of 80% recycling and recovery for C&D waste has been established. Waste contractors will be assessed based on their ability to meet this goal and must provide verifiable evidence of their success in doing so.

6 Environmental Management

6.1 Noise and Vibration

The works will be conducted in compliance with BS5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites, with careful consideration given to potential noise impacts arising from construction activities. Noise is primarily expected to be generated by plant and machinery operations, particularly during earthworks and rock-breaking processes.

To mitigate the potential noise impact on local residents, working hours will be limited to appropriate daytime hours specified in Section 2.1, thereby avoiding early morning noise generation. Additionally, the following measures will be employed to control noise emissions:

- Turning off HGV engines during prolonged parking on site and while loading demolition waste materials;
- Utilising low-impact reversing alerts and refraining from horn usage, where possible, while maintaining essential safety measures;
- Selecting equipment with lower noise output and incorporating silencers/dampeners;
- Implementing radio communication throughout the site to prevent shouting or whistling;
- Ensuring proper maintenance of plant and equipment to meet noise emission specifications and maintain effective noise attenuation features; and
- Opting for mains power supply over generators, as much as possible.

The site manager's contact details will be displayed at the site entrance, and local residents or the public will be encouraged to report any noise-related concerns. All noise complaints will be logged, investigated, and addressed with appropriate measures to reduce noise emissions.

Vibration impacts from the proposed works are not expected to be significant. Although minor vibrations may be generated by heavy plant and machinery, it is anticipated that there will be no need for piling or substantial percussion equipment, which could potentially cause vibration effects or damage.

6.2 Soil & Groundwater

The proposed development will require surface stripping to prepare the site for the new construction. Additionally, some cut and fill will be required to attain the necessary site formation levels. In designing the development, efforts have been made to minimise cut/fill however this is largely constrained by the existing levels along the western boundary. Hence, given the site's topography, significant cut is required on the east side of the site.

To minimise the quantity of materials to be removed from the site, excavated soil and stone materials will be reused within the site boundaries wherever possible. Any material intended for retention on site for landscaping will be relocated to these landscaped areas as quickly as possible. The primary contractor will limit the extent of areas of exposed soil at any given time to decrease the possibility of dust generation during dry periods or the creation of sediment-laden run-off during wet periods. Where feasible, construction activities will be scheduled during dry weather conditions.

Before the start of topsoil removal and the commencement of earth-moving activities, comprehensive measures specific to surface water management shall be instituted to ensure minimal environmental impact. These measures are listed below as follows:

- Substantial earth-moving tasks are to be predominantly scheduled within the summer season, conditions permitting, to capitalize on reduced precipitation rates.

Essential contact information for pertinent authorities, including the Dun Laoghaire-Rathdown County Council Environmental Section, Inland Fisheries Ireland, the Environmental Protection Agency, and the National Parks and Wildlife Service, will be clearly displayed within the site area. Immediate notification to these bodies is mandated in the case of a pollution incident.

Training programmes for on-site staff will emphasise the criticality of pollution prevention and adherence to the stipulated mitigation strategies.

The protocol for the storage of materials such as soil, hardcore, or crushed concrete necessitates a minimum clearance of 10 meters from any surface water drains. Moreover, all storage sites must implement runoff control systems to preclude material dispersion. Direct pumping of turbid waters into watercourses is strictly prohibited; instead, all excavated water must undergo treatment through land infiltration or settlement methodologies, such as the use of silt busters.

These preparatory measures will form the cornerstone of the site's water management strategy, ensuring the preservation of adjacent watercourses and compliance with environmental regulations.

6.3 Surface Water

To safeguard surrounding watercourses, proactive pollution prevention measures will be implemented, ensuring no pollutants infiltrate the local water system. During construction, surface water runoff management will align with the CIRIA C698F publication Site Handbook for the Construction of SUDS.

A minimum distance of 20 meters will be maintained between material stockpiles and watercourses or manholes, with silt fences set up at the base of stockpiles to impede runoff. The main contractor will monitor these fences daily, removing silt as needed and promptly repairing any damage. During heavy rainfall, tarpaulins or polythene sheets will cover stockpiles to minimize sediment release.

6.3.1 Control of Concrete and cement run-off

The washing out of concrete delivery vehicles is a potential source of pollution and shall be carried out in designated wash out areas only. Wash-out areas on site will be 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. Onsite 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 15m from any temporary or permanent drainage features.
- Emergency procedures shall be in place to deal with accidental spillages of cement or mortar.

6.4 Ecology

To minimise disruption to local fauna during construction, the following measures will be adopted:

- Noise control measures, including limited working hours as described above and noise emission reduction;
- Turning off plant machinery when not in use;
- Restricting site illumination to the minimum required for health and safety, and implementing task-specific lighting;
- Minimising light spill wherever feasible;
- Confined operation of equipment and machinery within site boundaries.

In accordance with The Wildlife Act 1976 (as amended) and the European Communities (Birds and Natural Habitats) Regulations, 2011-2015, mitigation measures will be implemented to protect fauna and minimize adverse impacts.

6.4.1 Spread of Invasive Species

The Contractor will be required to implement best practice measures to mitigate and prevent the spread of invasive species at the site:

- Comprehensive cleaning of all construction machinery (such as excavators, tracked vehicles, and boots) using a high-pressure washer, with decontamination occurring in a specialised area before entering and exiting the site. This is crucial for hindering the spread of invasive species like Japanese knotweed (Fallopia japonica) and Himalayan Balsam (Impatiens glandulifera). A documented log will be kept by the Contractor to verify these cleanings.
- Materials collected in the cleaning zone will be treated as contaminated and managed accordingly.
- Suppliers are required to certify that materials delivered to the site are devoid of invasive species.
- It's vital to educate all site personnel about the identification, prevention, and management of invasive species.
- Conduct educational toolbox talks prior to initiating work on-site.
- Install clear signage around the site promoting hygiene practices in relation to handling invasive non-native materials.
- The Contractor must develop and execute an Invasive Species and Biosecurity Plan that encompasses these strategies.

6.4.2 Habitats

Hedgerow

The value of hedgerow habitat is high as they act as wildlife corridors and provide opportunity for small breeding birds/ passerines to nest within these areas. Measures will thus be proposed to ensure that breeding birds are not endangered by the vegetation removal activities, and awareness around the breeding bird season – 1st March to 31st August inclusive is fully in place.

6.4.3 Species

Terrestrial Mammals

Construction Phase

Prevention of Physical Injury
Uncovered deep excavations could be hazardous for commuting/ foraging mammals in the area (e.g. Badger, hedgehog, small mammals such as shrew, vole etc) could fall into open excavations, becoming trapped and potentially hurt and distressed. To protect mammals from indirect harm during construction, all open excavations will be covered when not in use and backfilled as soon as possible. Excavations will also be covered at night, and any deep excavations which must be left open will have appropriate egress ramps in place to allow mammals to safely exit should they fall in. Battering the excavation sides to a safe angle of repose can also reduce risks to wildlife. These mitigation measures will protect badger and other mammals from general site obstacles, preventing accidental trapping or entanglement.

Habitat Protection & Enhancement
Retention of existing habitats where possible will be a key requirement for the contractor, and supplementary or replacement planting of habitats, to eventually produce habitats of better quality than were there previously.

Reduction of Light Spillage
In order to reduce the amount of light spillage, louvres and hoods should be affixed to lights during construction activities to reduce the amount of light spill onto hedgerows and tree lines.

6.5 Waste Management

Where feasible, materials will be segregated on-site to optimise their potential for off-site reuse. To enable storage before transportation off-site, skips and haulage trucks will be temporarily situated near work areas.

Beside the construction compound, adequately sized skips will be allocated for general construction waste and materials such as wood, metal, and plastic. For recyclable paper and cardboard waste generated in site offices, and for food waste from the canteen, smaller wheelie bins will be made available. A leak-proof container will be provided for storing contaminated spill kit absorbents.

Compliant with the Waste Management (Collection Permit) Regulations 2007, as amended, authorised waste contractors will collect both non-hazardous and hazardous waste materials from the site. These materials will be transported to licensed or permitted waste facilities for proper recovery or disposal.

The main contractor will maintain hard copies of waste collection permits and waste facility licenses/permits for all appointed waste hauliers and facilities on site. They will also keep records of every waste movement off-site. Dun Laoghaire-Rathdown County Council's authorised personnel will be granted access to inspect and review all waste records at any given time.

The project’s Environmental Manager will oversee waste management, ensuring maximum on-site waste segregation. This manager will also confirm that signage is displayed on skips to indicate acceptable waste types and maintain waste records.