Cosgrave Developments

Blackwood Square, Northwood, Santry Demense, Dublin 9

Planning Application to An Bord Pleanala

Construction and Demolition Waste Management Plan

November 2019

BARRY & PARTNERS
consulting engineers

CIVIL • STRUCTURAL • ENVIRONMENTAL • TRANSPORTATION

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Table of Contents *(incl. Y/N)*	**List of Tables** *(incl. Y/N)*	**List of Figures** *(incl. Y/N)*	**Pages of Text** *(No.)*	**Appendices** *(No.)*
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SECTION 1: INTRODUCTION

1.1 Purpose

The purpose of the Construction and Demolition Waste Management Plan (CDWMP) is to provide a framework to ensure that the construction works are effectively managed during the construction, commissioning and handover periods of the development, and that appropriate mitigation, monitoring, inspection and reporting mechanisms are implemented.

An outline Construction Environmental Management Plan (CEMP) has also been prepared and should be referenced in conjunction with this document.

The CDWMP and CEMP requires that every reasonable effort be made to reduce and preferably to prevent negative impacts, while enhancing positive impacts/benefits during construction. The objectives of the project are summarised in Table 1-1.

Table 1-1: Objectives and Targets during Construction Period

Objective /Principal	Description
Ensure construction activities are carried out in accordance with the Conditions of Consent.	Prepare a contract specific CDWMP prior to commencement of construction contracts that reflects all environmental constraints and risks identified in the EIAR and sets out all mitigation measures identified in same and additional appropriate mitigation measures as may be necessary.
	Review and update the CDWMP as necessary on a regular basis throughout the construction stage of the project.
	Ensure Contractors comply with the CDWMP and implement the controls, procedures, method statements and plans therein.
	Review and improve these documents on an ongoing basis throughout the project.
Construction work is carried out with minimal impact on the Natural Environment	Construction is carried out in compliance with the contract specific CDWMP and any associated Method Statements, Plans and Procedures.
	Construction activities, particularly in relation to sensitive habitats and species, are subject to environmental/ecological supervision / under ecological direction as appropriate.
	Minimise the risk of pollution by ensuring all mitigation measures are implemented and effective.
	Construction activities are undertaken in accordance with national/international legislation.
	Effective waste management techniques are adopted on site as per Waste Management Plan.
	Develop and maintain an Environmental Incident Response Procedure and ensure adequate spill response. Spill kits are available on site.
Construction work is carried out with minimal disturbance to landowners and the local community.	Minimise potential for noise and vibration, traffic and dust impacts by ensuring all mitigation measures are implemented and plans are adhered to.
	Minimise disruption to local road users through effective management of traffic and construction related haulage in line with contract specific Traffic Management Plan.
	Keep sites clean and tidy at all times.
	Respond to any local concerns regarding construction activities.
	Report on environmental performance of construction activities.
Construction work is carried out with minimal impact on archaeology.	All features of archaeological interest to be treated in accordance with the defined mitigation measures.

Objective /Principal	Description
Adopt a sustainable approach to construction.	Minimise use of natural resources and source materials locally where possible.
	Minimise resource wastage and reuse materials where possible.
	Ensure a policy of reuse and recycling is adopted on the project.
	Ensure energy efficiency is considered when operating plant and machinery and running site offices and compounds.
Provide adequate environmental awareness for all project personnel	Ensure all personnel are aware of their environmental responsibilities and undergo induction training appropriate to their needs, prior to commencement of construction. Training and awareness of personnel will continue throughout the construction phase through provision of Toolbox talks or equivalent. Provide environmental training /talks on environmental issues associated with particular sensitive locations, construction activities and environmental best practice where required.
	Appropriate environmental signage will be erected on site where required. Details of site managers, contact numbers (including out of hours) and public information signs (including warning signs) at the entrance and, where appropriate, at the boundaries of the site.

1.2 Contract Specific CDWMP

A contract specific CDWMP will be prepared prior to commencement of works and shall be a specific, targeted, and 'stand-alone' plan to ensure that all of the mitigation measures, obligations, requirements and constraints identified in all relevant documents including the CEMP, EIA and planning conditions, are fully implemented under the construction contract.

The Contractors shall prepare the following for inclusion with the contract CDWMP:

- Management Structure for Construction and Operation Phases;
- Resources – roles and responsibilities;
- Training;
- Construction Activities and Sequencing;
- Method statements;
- Communications;
- Management of Sub Contractors;
- Monitoring;
- Inspections and Auditing;
- Reporting;
- Corrective and Preventative Action Procedures;
- Procedures for Review and Improvement; and
- Records.

SECTION 2: PROJECT PARTICULARS AND CONSTRUCTION ACTIVITIES

2.1 Site Location

The site location and site plan are shown in Figures 2.1 and 2.2 below:

Figure 2.1: Location of Blackwood Square *(Source: Google Maps, annotation by J.B. Barry & Partners)*

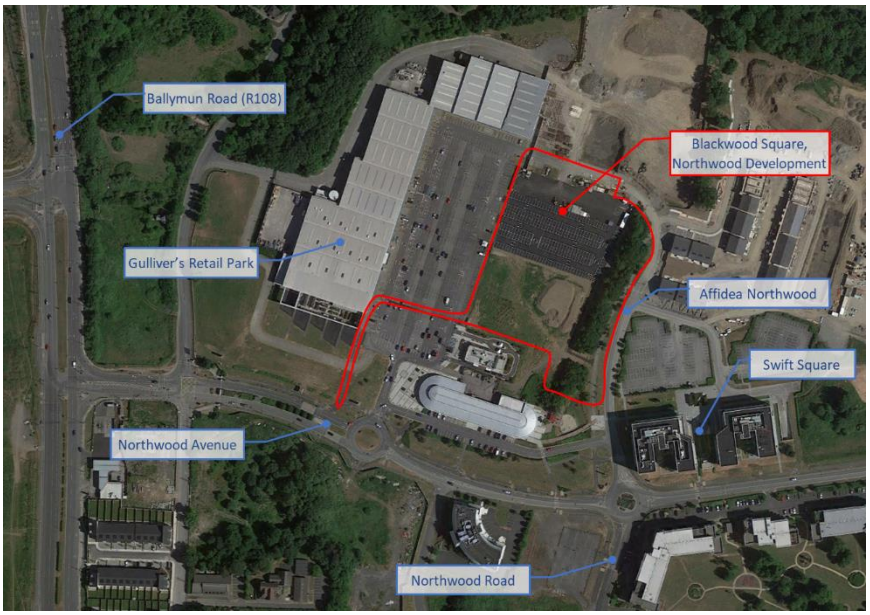


Figure 2.2: Site Plan - Blackwood Square *(Source: Google Maps, annotation by J.B. Barry & Partners)*

2.2 Project Description

The proposed development will consist the construction of 4 No.7-storey plus penthouse apartment blocks containing 331 No. apartment units, a multi-function area (c.133sq.m), a gym (c.140sq.m), a childcare facility (c.224sq.m), a concierge (c 81.5sq m) in Block A, 5 No. ground floor mixed use commercial units with a total area of c. 939sq.m; associated car parking (including 334 resident spaces at basement level), 760 No. bicycle storage spaces, 5 No. motorbike spaces, refuse storage, substation, landscaped public open space; network of pedestrian and cycle paths tying in with existing pedestrian and cycle paths on Northwood Avenue with access points along the south, north east and west boundaries of the site; and associated drainage arrangements, landscaping and site development works, all on a site of c. 2.119h.

2.3 Outline of Proposed Construction Works

2.3.1 Phasing

It is intended to carry out the proposed development in a single phase and construction may take up to 3 years to complete.

The main stages of construction will proceed in a general sequence as follows:

- Enabling Works including set-up of site construction facilities
- Service diversion works;
- Site clearance will include cut and fill of existing ground profiles and formation of basement excavation;
- Construction of drainage, water supply and utility service distribution network within the site;
- Construction of basement car park and podium/transfer slab at ground level
- Construction of multi-storey apartment blocks
- Roads, landscaping and paving
- Building fit-out and commissioning.

2.3.2 Working Hours

This plan will include the permitted site operation hours which are expected to be 07:00-19:00 on weekdays and 09:00-13:00 on Saturdays with no works on Sundays or bank/public holidays in accordance with the Environmental Noise regulations 2006

2.3.3 Construction Site Access

Pedestrian access will be strictly controlled. Only Safepass accredited personnel will be permitted on site and daily in-out attendance records will be maintained. Safe pedestrian access points will be provided based on the stage of works and layout of the construction site.

Construction traffic will access the site via the existing access off Affidea Northwood Road to ensure minimal disruption on other routes. The routing will be strictly managed and controlled, and details will be incorporated into the traffic management plan - refer Section 4-11 of this report.

A site compound will be provided adjacent to the development site to the north. Construction car park will be accommodated within the site compound.

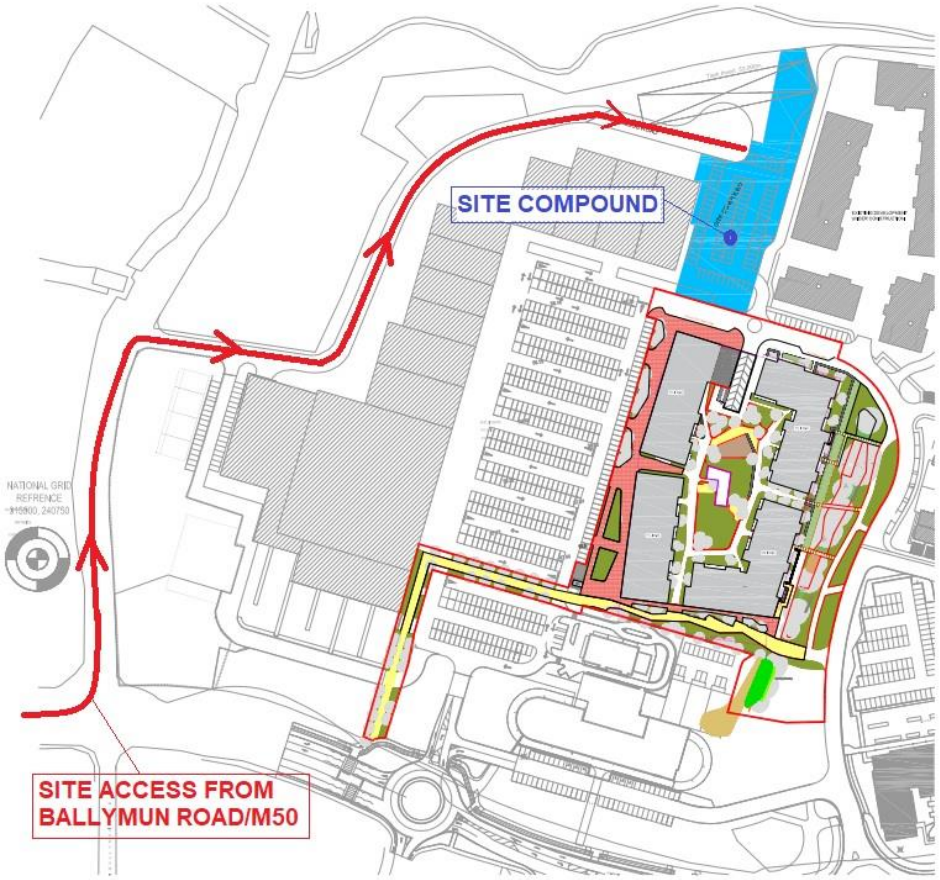


Figure 2.3: Site Access and Compound

2.3.4 Structural Works

A geotechnical investigation was undertaken by Ground Investigation Ireland Limited in February 2019. The main findings established a stiff layer of black boulder clay at approximately 2.0-2.5m below ground level throughout the site and the water table was not encountered in any trial pits or boreholes at a depth of 7.5m.

The construction of the basement will involve excavations to an approximate depth of 4.0m below existing ground level and the removal of approximately 47,000m^3 of excavated material from site.

All foundations will be founded on the stiff layer of black boulder clay and will consist of reinforced concrete pad footings to columns and strip footings to all retaining, core and stairwell walls.

The basement structure will be constructed with reinforced concrete perimeter retaining walls and reinforced concrete basement slab on concrete blinding on boulder clay. All columns and load-bearing walls at basement level to the underside of ground floor/podium level will be reinforced concrete and all non-loadbearing partition walls will be 215 solid blockwork.

All apartment blocks will be constructed on reinforced concrete transfer slabs at ground floor level to transfer all upper level loadings into basement columns.

Upper floors will consist of precast floor structures supported on load-bearing blockwork. Blockwork strengths will vary throughout each floor level. The precast floors will consist of hollowcore units with a reinforced structural screed.

Balconies will be fabricated in galvanised structural steel frames supported on external steel columns and fixed back to the main concrete structure with steel stub brackets.

It is envisaged that four tower cranes will be erected on site for the duration of the construction period.

2.3.5 Drainage Works

The foul and storm sewer networks will be on the separate systems. No foul effluent will discharge to the storm water system.

Foul sewer construction will comply with Fingal County Council and Irish Water's requirements, specification and standard details.

Irish Water has confirmed that there is capacity in their wastewater infrastructure to cater for this development without upgrades - refer to the IW Confirmation of Feasibility Statement a copy of which is included in Appendix 1 of the Water Services Report prepared by J.B.Barry and Partners Limited and which forms part of the planning application.

Details of the proposed surface water network and the proposed SuDS (Sustainable Urban Drainage Systems) measures for this development are shown on drawings 19205-JBB-00-XX-DR-C-01001 Rev P3, 19205-JBB-00-XX-DR-C-01002 Rev P5 and 19205-JBB-00-XX-DR-C-01007 Rev P3 prepared by J.B.Barry and Partners Limited and which form part of the planning application.

SECTION 3: CONSTRUCTION MANAGEMENT

3.1 Employer

Cosgrave Developments are the Employer and Main Contractor for the development and shall have responsibility for the organisation, direction and execution of the works. They will ensure that competent parties are appointed to undertake all elements of works, sufficient resources are made available at all stages of the project and will appoint temporary or permanent Specialists as required.

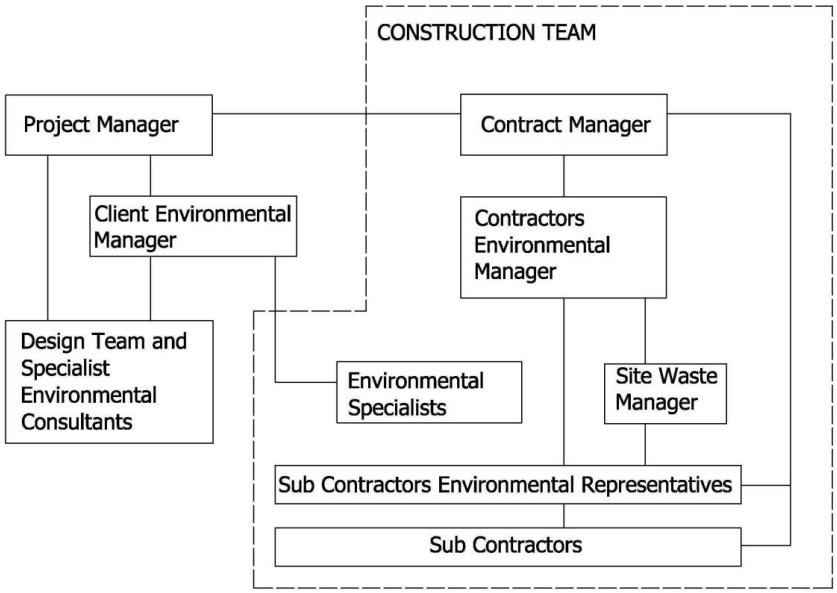
3.2 Employers Representative

J. B. Barry and Partners Limited are the Employers Representative (ER) and will be responsible for monitoring compliance with the CDWMP.

3.3 Specialists engaged by the Contractor

To fulfil its obligations under the CDWMP and CEMP Cosgrave Developments have engaged suitably qualified and experienced consultants to monitor the following:

- Health and Safety
- Archaeology
- Ecology
- Ecology – Invasive Species
- Air Quality
- Noise
- Vibration
- Dust
- Waste



3.4 Health and Safety

3.4.1 Permits and Authorization Requirements

The following operations will need to be undertaken by means of a permit to work system.

- All metal grinding or other abrasive wheel work, or sand blasting.
- Hot works
- Hazardous material removals

3.4.2 Training

General Requirements

The contractor is required to provide suitable training and instruction, to minimise risk of injury to employees and other persons using the workplace. Four types of training should be considered.

a) **Induction -** ensuring that new recruits are clear about the key rules, and the need to follow them and accept supervisory scrutiny and guidance from experienced colleagues.

b) **Basic Training -** usually provided as a formal training programme either provided in a block or in short modules during the first days / weeks of working.

c) **Reminder / skill development -** best provided topic by topic in 10 minute “toolbox talks” with an opportunity for staff to comment and ask questions, thereby forming part of the organisation’s employee staff consultation process.

d) **Training for Persons Directly Involved -** All those workers who operate and maintain plant and machinery, or work in the field of operations operatives, and their direct supervisory staff should receive training and instruction.

3.4.3 Existing Services

Prior to commencement the contractor shall make enquiries to establish the position of any existing services within or adjacent to the environments of the site. The PSCS shall check for the existence of all services in the area of work and locate and mark or arrange for the owning authorities to locate/mark any services which may be affected by the works. The contractor shall review utility services drawings. The contractor should take all normal precautions against the risk of exposure to any live underground and overhead services within and in the vicinity of the site area. The contractor is to ensure compliance with the Code of Practice for Avoiding Danger from Underground Services and also the ESB Code of Practise for Avoiding Danger from Overhead Lines.

All existing gas pipes, water pipes, electric cables, sewers, drains and other services which do not in the opinion of the Engineer require to be changed in location, shall be carefully supported and protected from damage by the Contractor and in the case of injury shall be restored by him to as good condition as that in which they were found.

3.4.4 Vehicle and Pedestrian Hazards

All deliveries to the site shall be made via the approved access roads. Adequate manning and use of banks man to be allowed. The Contractor shall submit proposals for on-site storage areas for approval by the Project Supervisor (Construction) and segregate these from the works. Prior to works commencing on site

The Contractor shall implement an appropriate booking in and out system for all site operatives and visitors. Contractor's personnel shall carry appropriate identification at all time on site. All site personnel to have Safe Pass and Construction Skills Certification where appropriate. Unauthorised access to the site should be prevented. Site safety representative shall be appointed. The contractor shall institute a formal site induction procedure including issue of P.P.E. as appropriate for all personnel.

Warning signs sealed off access signs/barriers and "out of bounds" notices must be provided where relevant as the works proceed. The contractor is advised of the requirements for safe pedestrian access to be maintained at all times to the rest of the site. Temporary signs, sealed off access signs, barriers and "out of bounds" notices will be provided where relevant as the works proceed. Hoarding and site security generally must be of a high standard. Site access points must be manned and monitored at all times when work is in progress, and secured when work is not in progress.

3.4.5 OTHER PRECAUTIONS

General

- Every working place and approach and all openings dangerous to persons employed and others should be properly illuminated and protected.
- Before carrying out any part of the work the contractor should consider prevailing weather conditions and weather forecasts. Attention should be paid to the effects of wind (especially when operating cranes).
- When materials and debris are lowered, care should be taken to prevent the material from swinging in such a manner that it creates a danger to the safety of either personnel or the surrounding structure.

Electrical Hazards

The main hazards arising from electricity on this project include electric shock, burns, fires and explosions. A planned schedule shall be used for the testing and inspection of portable electrical equipment. This shall include the strength and capability of electrical equipment, protection against adverse/hazardous conditions. Persons working on electrical equipment shall have the necessary competence requirements to carry out their work safely and not endangering themselves or others.

When mechanical plant is used, care should be taken to ensure that no part of such machines can come into direct contact or in close proximity to overhead cables.

NOTE: Additional safety advice on the danger from electricity overhead lines and underground cables is given in Guidance Noted GS6 published by the Health and Safety Executive and in the booklet *Recommendations on the avoidance of danger from underground electricity cables* published by the National Joint Council Utilities Group of British Telecom, the Electricity Council, British Gas and the British Water Council and E.S.B. Guidelines code 9803203, Health & Safety Authority which are similar in scope. The ESB Code of Practice for Avoiding Danger from Overhead Electricity Lines and The Code of Practice for Avoiding Danger from Underground Services must be taken account of when working with electrical hazards.

Fire or Explosion Risks

Precautions should be taken to prevent the risk of fire or explosion caused by gas or vapour. When the thermal reaction or thermal lancing methods are used, consideration should be given to the prevention of oxygen enrichment and the attendance risk of explosion or ignition of

flammable vapour. Containers of oxygen, acetylene or liquefied petroleum gas should be handles with care and stored and used in accordance with good practice.

Gas cylinder and similar containers, whether empty, in use or spare, should be stored in a safe place, in accordance with good practice, since if they become involved in a fire any resulting explosion may cause injury to persons and damage to property.

Flammable liquids shall be used only in small amounts in approved, self-closing safety cans and shall be stored in approved flammable liquid cabinets.

“NO SMOKING” signs shall be posted where appropriate and will be strictly observed.

Access to fire extinguishers and other firefighting equipment must not be obstructed.

Water-type extinguishers shall not be used on electrical fires.

Know the location and the correct operation of the nearest fire extinguisher.

When used, fire extinguishers shall be recharged prior to being returned to service.

Fire extinguishers shall be inspected at least monthly and shall be maintained fully charged.

Report all fires to your supervisor.

A Company Welding and Flame Permit shall be issued before welding or cutting in close proximity of flammable and combustibles.

Excavations

Numerous hazards associated with excavation work exist: contact with over ground/underground lines/services, collapse of excavation sides, materials, vehicles and people falling in to the excavation, materials falling onto people in the excavation, people being struck with plant, groundwater, soil, fumes and accident to members of the public.

A safe system of work plan shall be used for the start of each new activity. Supervisions must be completed at the start of each activity and reviewed appropriately. A competent person shall supervise the installation, alteration or renewal of excavation supports. The contractor is to ensure compliance with the Code of Practice for Avoiding Danger from Underground Services.

See also the Health & Safety Authority’s Publication: A Guide to Safety Excavations.

Working at Height

Work at height is work in any place, including a place at, above or below ground level, where a person could be injured if they fell from that place. Taking this into account, work at height activities shall be identified as the works progresses. The regulations shall be applied continuously throughout the project, most notably during work in/near excavations in addition to the extension and even the refurbishment works.

The main onus in relation to these regulations include: to carry out a risk assessment, to follow the General Principles of Prevention (taking steps to prevent, avoid or reduce risks) and finally to choose the correct equipment and select collective measures to prevent falls (i.e. guard rails, working platforms etc.). These should be selected before other measures which may only reduce the distance and the consequence of the fall.

A safe system of work is required when planning to do work at a height. This system should include; appropriate supervision where necessary, weather conditions workers may be exposed to and emergency/rescue procedures that may be required.

Housekeeping

This is a significant issue during the internal works. It's also important within the designated site compound.

The main onus on all contractors is related to their organisation/co-operation with a view to protecting workers & preventing accidents on site. The main issues that need to be addressed continually include general material storage, access & egress within the site and ensuring that traffic routes (horizontal & vertical) are kept clear. Housekeeping is vital to prevent slips, trips and falls and falling materials. It should cover the storage, use, cleanup and adequate disposal of materials. Good housekeeping results in a safe, efficient and non-polluting site.

The contractor is required to ensure compliance with the Safety Health and Welfare at Work Act Construction Regulations 2013, Safety Health and Welfare at Work Act General Application Regulations 2007 and all amendments.

SECTION 4: CONSTRUCTION AND ENVIRONMENTAL MANAGEMENT MEASURES

4.1 General Construction Management Measures

The following table contains a summary of the construction and environmental management measures that are required to be implemented during the design, mobilisation and construction works to be undertaken in relation to the proposed development.

Table 4-1: General Construction Management Measures

Topic	Management Measure
Construction Impacts General	A detailed *Construction and Demolition Waste Management Plan* (CDWMP) and a *Construction Environmental Management Plan* (CDEMP) will be prepared by the contractor prior to work commencing on site. The main purpose of these documents is to provide a mechanism for implementation of the various mitigation measures which are described in this EIAR and contained within the outline plans and have regard to the guidance contained in the handbook published by Construction Industry Research and Information Association (CIRIA) in the UK, *Environmental Good Practice on Site*, CIRIA 2005. Any planning conditions imposed by the planning authority shall be strictly observed and monitoring requirements shall be observed as conditioned.
Guidance Documents	▪ Measures set out in the Construction Industry Research and Information Association (CIRIA) on Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors Volume 532 shall be adhered to by the Contractor ▪ The Guidelines entitled "Requirements for the Protection of Fisheries Habitats during Construction and Development Works at River Sites" prepared by the Eastern Regional Fisheries Board shall be adhered to in full by the Contractor.
Emergency Response Plan	A contract specific Emergency Response Plan shall be prepared by the Contractor and shall include an emergency work procedure to deal with any accidental/emergency spills of hazardous substances (oils, hydraulic fluids, concrete/cement etc.). This will be submitted to the ER for approval.
Contact Details	Details of site managers, contact numbers (including out of hours) shall be listed on public information signs (including warning signs) at the entrance and, where appropriate, at the boundaries of the site.
Fuel / Chemical Handling	▪ All potentially harmful substances will be stored in compliance with the handling instruction, including separation of incompatible chemicals, provision of adequate firefighting, spill containment and other safety facilities. ▪ The Contractor will ensure that adequate means (Spill Kits) to absorb or contain any spillages of these chemicals are available on site at all times. Any waste or hazardous waste residuals or potentially contaminated sludge from spill clean-up shall be stored in appropriate receptacles or containers, or in bunded storage areas prior to their removal by an EPA licensed contractor. ▪ Any handling of hazardous chemicals shall be in compliance with the relevant safety instructions and legislation (Safety, Health and Welfare at Work Act 2005 (S.I. No. 10 of 2005) and the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 (S.I. No. 619 of 2001) and the Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. No 299 of 2007) and amendments). ▪ A Safety Data Sheet will be available, as well as an assessment of the hazards associated with the chemical (to personnel, for storage, for emergency response).
Fuel / Chemical Handling	▪ All fuels or chemicals substances (e.g. oils, diesel, herbicides, pesticides, concrete etc) kept on the construction site shall be stored in bunded containers in specified hard standing bunded areas with the provision of a storage/retention capacity of 110% of tank storage. ▪ No refuelling or maintenance of vehicles and equipment shall be carried out within 20 metres of any water course
Water Discharge General	Where the Contractor proposes discharging effluent (including groundwater) from the site to waters or to a sewer under the Local Government (Water Pollution) Acts and Regulations it shall obtain at its own cost and expense all consents, approvals, and/or licences required and shall strictly comply with all conditions, constraints and requirements imposed by same.
Discharge to waters	Any discharges arising from the construction phase shall incorporate silt removal and hydrocarbon removal using a hydrocarbon interceptor (which will comply with current European Standard EN858).
Sewage	Foul sewage shall be removed off site and disposed of by discharging to a licensed sewer network by

Topic	Management Measure
Management	the Contractor. Any discharges arising from the construction phase of the proposed scheme entering the foul/storm sewer network will be in accordance with the requirements of a discharge licence (if required) granted by Fingal County Council.
Cement Washout	Designated impermeable cement washout areas must be provided.
Stockpiles	Any excavated vegetation, soil and subsoil will be temporarily stockpiled away at least 20 m from any surface water features in order to reduce the likelihood of any suspended solids reaching them;
Pest Control	A Pest Control Plan for the construction phase shall be completed and included in the Contract specific CEMP written by the Contractor.

The following specific mitigation measures will be implemented during the construction period:

4.2 Population and Human Health

This section includes the measures that are required to protect human beings and material assets during the design and the execution of the project. The contract CDWMP and CEMP shall detail all measures (including method statements) to be employed in relation to all potential impacts on human beings and material assets; and how the following mitigation measures will be implemented.

Table 4-2: Population and Human Health Management Measures

Topic	Management Measure
Human Health	It is recommended that a rodent and pest control plan is put in place so as to manage and limit any potential disturbance to populations that may utilise the site. The pest control plan should be in accordance with the Chartered Institute of Environmental Health's "*Pest minimisation Best practice for the construction industry"* guidelines or a similar appropriate standard.
Human Health	During the construction phase, the legal duties under the Construction Regulations (Safety, Health and Welfare at Work (Construction) Regulations 20135) will be adhered to;
Human Health	It is recommended that a rodent and pest control plan is put in place so as to manage and limit any potential disturbance to populations that may utilise the site. The pest control plan should be in accordance with the Chartered Institute of Environmental Health's "*Pest minimisation Best practice for the construction industry"* guidelines or a similar appropriate standard.

4.3 Terrestrial Biodiversity Management

This section includes the measures that are required to protect terrestrial ecology during the execution of the project. The contract CDWMP and CEMP shall detail all measures to be employed in relation to all potential impacts on terrestrial ecology and how the following measures will be implemented. No Invasive Species have been identified in the areas where the Contract relating to the current application will be undertaken.

Table 4-3: Terrestrial Biodiversity Management Measures

Topic	Management Measure
Breeding birds	In order to avoid disturbance of breeding birds, their nests, eggs and/or their unflown young, all works involving the removal of trees or hedgerows will be undertaken outside of the nesting season (1st March to 31st August inclusive). **Or where this seasonal restriction cannot be observed then:** A breeding bird survey will be undertaken during the appropriate survey season (between early March

Topic	Management Measure
	and late June) by an ecologist with experience undertaking breeding bird surveys in order to confirm whether birds are nesting within suitable habitat affected by or immediately adjacent to the subject lands. Should nesting birds be encountered during surveys, the removal of trees or hedgerows may be required to be delayed until after the nesting season (1st March to 31st August inclusive).
Bats	The following mitigation measures are proposed to ensure compliance with legislation within the Wildlife Acts 1976-2012 which protects bats and their roosts: Two trees located within the proposed development site contained suitable features for roosting bats. As a precautionary measure, it is recommended that the potential bat roost trees are inspected by an experienced ecologist for the presence if they are to be felled. They should be section-felled using controlled rigging under the supervision of an experienced ecologist. If bats are present, the relevant works will have to cease and NPWS will have to be contacted in order to obtain a derogation licence. Lighting proposals for the construction phase will adhere to the advice provided in Bats and lighting – *Guidance for Planners, Engineers, Architects and Developers* (Bat Conservation Ireland 2010), *Guidance Notes for the Reduction of Obtrusive Light GN01* (Institute of Lighting Professionals, 2011) and *Bats and Lighting in the UK – Bats and the Built Environment Series* (Bat Conservation Trust UK, January 2008). Construction and operational stage lighting details shall be reviewed by a qualified bat ecologist. If necessary, the bat ecologist shall recommend adjustments to directional lighting (*e.g.* through cowls, shields or louvres) to restrict light to those areas where it is needed with a light level of 3 lux or less at ground level.
Hedgerows	In order to preserve the trees to be retained within the hedgerow, the root protection area must be calculated by a qualified arborist. Protective barriers must be installed to exclude construction activities from the root protection area of the trees. The existing hedgerow will be retained where possible and enhanced with a range of native species including herbaceous and shrub species.
Amphibians	An amphibian check will be carried out by an experienced ecologist prior to works to infill the drainage ditch to ensure that no protected species are present. Should amphibians be encountered during this check, works must be delayed in order to apply for a derogation licence to the NPWS to allow for the disturbance of amphibians.
Surface Water Discharge	See mitigation measures outlined in the Table 4-4.

4.4 Water Management.

This section includes the measures that are required to protect surface water and groundwater during the design and execution of the project. The contract CDWMP and CEMP shall detail all measures to be employed in relation to all potential impacts on water quality and how the following mitigation measures will be implemented.

Table 4-4: Water Management Measures

Topic	Management Measure
Drainage System	Design to incorporate Sustainable Urban Drainage Systems [SuDS] techniques (stormwater attenuation and Hydrocarbon interceptors) and to be compliant with recommendations of the Greater Dublin Strategic Drainage Study [GDSDS] and Fingal County Council.
Flood Risk Construction	▪ The attenuation storage will be established and the required outlet control to attenuate the discharge flow will be constructed as early as possible in the construction stage. ▪ Runoff from all impermeable areas formed during the construction stage will be directed through the existing storm water storage and attenuated to the greenfield runoff rate.
Protection of Fisheries	The guidelines provided by the Inland Fisheries Ireland (2016) on the protection of fisheries habitats during construction projects will be adhered to.
Control of Water Pollution	Foul drainage from all site facilities will be connected to the public sewer
Control of Water	Within the site boundary fence, temporary earth bunds will be constructed to contain surface water run-

Topic	Management Measure
Pollution	off and channel it to a silt trap or settlement pond before discharge to the drainage network
Control of Water Pollution	When cast in-place concrete is required, all work must be done in the dry and effectively isolated from any flowing water (or water that may enter rivers or streams) for a period sufficient to ensure no leachate from the concrete. No direct discharges to be made to waters where there is potential for cement or other contaminant residues in discharges. Designated impermeable cement washout areas must be provided.
Control of Water Pollution	Any excavated vegetation, soil and subsoil will be temporarily stockpiled away at least 20 m from any surface water features in order to reduce the likelihood of any suspended solids reaching them. Any soil contaminated from an accidental spillage will be contained and treated appropriately and disposed of in accordance with the Waste Management Act 1996-2012.
Control of Firewater Runoff (operational)	Discharge points to the drainage network will entail a mechanism for containment of runoff. This will be used to contain any contaminated runoff in the event of a major accident on site. In the event of a fire, the shutoff valve will close and the firewater will be contained in the attenuation storage system.

4.5 Noise and Vibration Management

This section includes the measures that are required to mitigate noise and vibration during the design and execution of the project.

The Contractor will compile a Noise and Vibration Management Plan (NVMP) which will deal specifically with management processes and strategic mitigation measures to remove or reduce significant noise and vibration impacts, and cumulative noise and vibration impacts from the construction works. The purpose of the NVMP is to ensure that the potential impacts from noise emissions are mitigated to avoid disturbance to the local community and wildlife. The purpose of the noise management programme is to ensure that the potential impacts from noise emissions are mitigated to avoid disturbance to the local community and wildlife.

Noise monitoring will determine the noise levels occurring at the nearest sensitive receptor due to site operations and to ensure they are kept within acceptable limits, by taking corrective action if necessary. Mitigation and monitoring will also ensure that the works are undertaken in a manner that does not give rise to significant negative impacts through minimising noise annoyance, noise disturbance or noise nuisance at noise sensitive receptors in the vicinity of the construction areas.

Table 4-5: Noise and Vibration Management Measures

Topic	Management Measure
Noise and Vibration Management	Contractor will compile and implement a Noise and Vibration Management Plan (NVMP) which will address ▪ management processes and strategic mitigation measures to remove or reduce significant noise and vibration impacts, and cumulative noise and vibration impacts from the construction works. ▪ noise and vibration monitoring and reporting. ▪ method statements for each phase of the works, the associated specific measures to minimise noise and vibration in so far as is reasonably practicable for the specific works covered by each plan and a detailed appraisal of the resultant construction noise and vibration generated.
Construction phase mitigation measures	During the construction phase, the proposal development shall comply with British Standard 5228 “Noise Control on Construction and open sites Part 1. Code of practice for basic information and procedures for noise control.” The BS5228 standards include guidance on several aspects of construction site mitigation measures, including, but not limited to: ▪ selection of quiet and or low vibration emitting plant; ▪ control of noise sources; ▪ screening; ▪ hours of work;

<table>
<tr><th>Topic</th><th>Management Measure</th></tr>
<tr><td></td><td>▪ liaison with the public; and
▪ monitoring.
If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control “at source”. This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier;</td></tr>
<tr><td>Site Compounds</td><td>Site compounds should be located away from noise sensitive boundaries within the site constraints. Lifting of bulky items, dropping and loading of materials within these areas should be restricted to normal working hours;</td></tr>
<tr><td>Construction Noise limit at Sensitive Receptors (Construction Stage)</td><td>
<table>
<tr><th>Period</th><th>Allowable Limit at Nearest Sensitive Receptor (dB L_{Aeq}) Operational Construction Stage</th></tr>
<tr><td>Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)</td><td>65dB $L_{Aeq,1hr,}$</td></tr>
<tr><td>Evening (19:00 to 23:00hrs)</td><td>55 dB $L_{Aeq,1hr,}$</td></tr>
<tr><td>Nighttime (23:00 to 07:00hrs)</td><td>45 dB $L_{Aeq,1hr,}$</td></tr>
</table>
</td></tr>
<tr><td>Noise limit at Sensitive Receptors (Operational Stage)</td><td>Plant noise from the proposed development shall not be so loud, so continuous, so repeated, of such duration or pitch or occurring at such times as to give reasonable cause for annoyance to a person in any premises in the neighbourhood or to a person lawfully using any public place. In particular, the rated noise levels from the proposed development shall not constitute reasonable grounds for complaint as provided for in B.S. 4142. Method for rating industrial noise affecting mixed residential and industrial areas”</td></tr>
<tr><td>Operations</td><td>Noise from building services plant will be minimised through the selection of “low noise” equipment where required as well as the incorporation of appropriate attenuation in the form of:
▪ Acoustic enclosures for fans;
▪ Provision of attenuators for fan intake’s; and
▪ Use of acoustic rated doors on all plant rooms or enclosures.
The following mitigation measures will be taken to reduce noise levels arising from the vehicular activity in and around the site:
▪ The design of the site is such that the need for reversing should be minimised in open areas and drivers will be required to adhere to onsite traffic management to reduce the use of reverse sirens.
▪ A speed limit of 20 km/h shall be applicable to all vehicles traversing the site.
▪ Under no circumstances are air brakes to be used by vehicles onsite.
Vehicle horns should not be sounded whilst onsite, except in the event of an emergency.</td></tr>
<tr><td>Noise control measures</td><td>During both the construction and operational phases, mitigation measures will include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise monitoring.
• For mobile plant items such as cranes, dump trucks, excavators and loaders, maintaining enclosure panels closed during operation can reduce noise levels over normal operation. Mobile plant should be switched off when not in use and not left idling;
• For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system;
• For percussive tools such as pneumatic breakers, a number of noise control measures include fitting muffler or sound reducing equipment to the breaker ‘tool’ and ensure any leaks in the air lines are sealed. Erect localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries;
• For concrete mixers, control measures should be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum;
• For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials;
• For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation;
• All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures;
• Screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. Standard construction site hoarding (2.4m in height) with a mass per unit of surface area greater than 7 kg/m2 can provide adequate sound insulation;</td></tr>
</table>

<table>
<tr><th>Topic</th><th>Management Measure</th></tr>
<tr><td>Vibration Limits.</td><td>Construction activities will be required to comply with the following vibration limits, measured at the nearest noise sensitive receptor:
<table>
<tr><th colspan="3">Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property (soundly constructed buildings) to the source of vibration, at a frequency of</th></tr>
<tr><th>Less than 10 Hz</th><td>10 to 50 Hz</td><td>50 to 100 Hz (and above)</td></tr>
<tr><td>15 mm/s</td><td>20 mm/s</td><td>50 mm/s</td></tr>
</table></td></tr>
<tr><td>Vibration Limits</td><td>In addition, construction activities will be required to ensure that vibration in the vicinity of underground services does not exceed the following:
▪ Maximum Peak Particle Velocity for intermittent or transient vibrations - 30 mm/s; and
▪ Maximum Peak Particle Velocity for continuous vibrations - 15 mm/s.</td></tr>
<tr><td>Communication</td><td>The contractor will take a “proactive community relations” stance and will distribute information circulars informing people of the progress of works and any likely periods of significant noise / vibration during construction as required, in line with the construction programme. A designated noise liaison officer will appointed to site during construction works.</td></tr>
</table>

4.6 Dust Management

This section includes the measures that are required to minimise and manage dust during the construction phase of the project. The contract CDWMP and CEMP shall detail how the following mitigation measures will be implemented.

Table 4-6: Dust Management Measures

Topic	Management Measure
Dust Management	▪ A Dust Minimisation Plan will be implemented during the construction phase. ▪ 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 using site roads will have their speed restricted, and this speed restriction will be enforced rigidly. ▪ Vehicles delivering material with dust potential (soil, aggregates) will be enclosed or covered with a tarpaulin at all times to restrict the escape of dust. ▪ 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. ▪ Water bowsers will be deployed within the sites during periods of dry weather to damp down potential dust generation from unbound surfaces.
Dust Management general	Dust mitigation measures will be specified in the CEMP. The Contractor shall ensure that management measures follow the guidelines set out in BE Report 456 Measures to mitigate the emission of dust due to construction activities should include, where appropriate and practicable: ▪ wind breaks and barriers, ▪ frequent cleaning and watering of the construction site and associated access roads, ▪ control of vehicle access, ▪ vehicle speed restrictions, covering of stockpiles, ▪ use of gravel at site exit points to remove caked on dirt from tyres and tracks, ▪ washing of equipment at the end of each workday
Dust Monitoring	The Contractor will comply with the TA Luft Standards “Technical Instructions on Air Quality Control”. Dust levels at the site boundary shall not exceed 350 mg/m^2/day averaged over a continuous period of 30 days.

4.7 Land and Soils and Waste Management

This section includes the measures that are required to manage waste impacts and to minimise impacts on the land soils during the construction phase of the project. The contract CDWMP and CEMP shall detail how the following mitigation measures will be implemented. A project specific Waste Management Plan in accordance with "Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (DoEHLG) - June 2006)" will be drafted by the contractor. An Outline Waste Management Plan is presented in Section 7.

It should be noted that site investigations carried out on the proposed site in 2019 found no evidence of contaminated soils. Based on the site investigations the soils to be excavated and disposed of are classified as inert.

Table 4-7: Land and Soils (Including Waste) Management Measures

Topic	Management Measure
Waste Management Plan	The appointed Contractor will prepare a contract specific Waste Management Plan for the project in accordance with "Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects. This will provide details of the exact methods it is proposed to employ to remove soils from the site and will include details of the location and end use of the spoil.
Project Waste Manager	A Project Waste Manager will be appointed by the Contractor to oversee the implementation and adherence to the plan during the construction phase of the project.
Waste Disposal	The waste generated on site will be delivered to authorised waste facilities in accordance with the Waste Management Acts 1996-2012.
Waste Management	As soil characteristics will vary during the construction operations, the Contractor will be required to implement, prior to the commencement of construction works, and thereafter maintain throughout the construction phase a comprehensive environmental monitoring programme in respect of the soil characteristics. If necessary, disposal outlets will be modified to ensure continuous compliance with all relevant regulations.
Reuse of Spoil	Soft materials and surplus soils that are excavated will be reused, for bunds, landscaping etc where possible. Material that cannot be re-used will be treated in accordance with the Landfill Directive (2003/33/EC).
Contaminated Material Disposal	▪ All unsuitable (including contaminated soils) material shall be disposed of in accordance with all relevant legislation including the Department of the Environment and Local Government (DoELG) (1996 to 2008), Waste Management Acts, the DoELG (1998) Waste Management (Permit) Regulations and the NRA (2008) Guidelines for the Management of Waste from National Road Construction Project. Material to0 be disposed of will be treated in accordance with the Landfill Directive (2003/33/EC). ▪ All waste shall be removed by waste contractors authorised under the (Waste Management (Collection Permit) Regulations, 2007 and the Waste Management Collection Permit) (Amendment) Regulations, 2008. ▪ The waste collected shall be delivered to authorised waste facilities in accordance with the Waste Management Acts 1996-2012. ▪ Any soil contaminated from an accidental spillage will be contained and treated appropriately and disposed of in accordance with the Waste Management Act 1996-2012.
Hazardous waste	Any waste or hazardous waste residuals or potentially contaminated sludge from spill clean-up shall be stored in appropriate receptacles or containers, or in bunded storage areas prior to their removal by an EPA licensed contractor.

4.8 Archaeology and Cultural Heritage Management

Management measures relating to the cultural and heritage environment are listed in Table 4-8 below.

Table 4-8: Archaeology and Cultural Heritage Management Measures

Topic	Management Measure
Supervision	Prior to the commencement of site preparation works, a suitably qualified and experienced archaeologist should be appointed to undertake the mitigation measures listed below.
Supervision	All topsoil stripping/general ground reduction works onto the underlying archaeologically sterile geological subsoils associated with the development shall be monitored by an archaeologist.
Archaeological Finds	In the event of archaeological material being uncovered during the course of such monitoring, the archaeologist shall be empowered to have works stopped in the vicinity of such material pending receipt of advice from the National Monuments Service, Department of Culture, Heritage and the Gaeltacht. Likewise, should archaeological/historical artifactual material be recovered during such works, then the requirements of the National Museum of Ireland with regard to such items should be implemented.
Reporting	Following completion of the monitoring and any other possible archaeological investigations, the archaeologist shall prepare a full and final report for submission to the Planning Authority and the Department of Culture, Heritage and the Gaeltacht and National Museum of Ireland.

4.9 Landscape and Visual Management

This section includes the measures that are required to protect landscape and visual aspects during the design and the execution of the project. The contract CDWMP and CEMP shall detail all measures to be employed in relation all potential impacts on landscape and visual and how the following mitigation measures will be implemented.

Table 4-9: Landscape and Visual Management Measures

Topic	Management Measure
Landscaping Plan	The scheme includes for an appropriate and comprehensive landscape scheme comprising earth mounding, dense deciduous and evergreen planting and an upgraded roadside boundary railing and entrance detail. This Landscaping and Reinstatement Plan will be agreed with the contractor and other appropriate stakeholders. Landscape measures will be completed as part of the construction works and maintained to ensure establishment. Failed or dead plants will be replaced in the following planting season.
Screening	The building site including a site compound with site offices, site security fencing, scaffolding and temporary works will be visible during the construction phase. The provision of site hoarding along the site and construction compound boundaries will substantially address many potential effects of construction operations during the delivery stage.

4.10 Material Assets Management

This section includes the measures that are required to material assets during the design and the execution of the project. The contract CDWMP and CEMP shall detail all measures (including method statements) to be employed and how the following mitigation measures will be implemented.

Table 4-10: Material Assets Management Measures

Topic	Management Measure
Utilities	▪ Communication and consultation will be conducted with public utility providers ahead of construction commencement. ▪ Underground surveying techniques are a key method of understanding the below ground conditions and confirming the presence of utility services. A Cable Avoidance Tool and a Signal Generator (CAT & Genny) are used to scan the surface of the ground with an audible signal being developed where underground utilities are detected. Surface radar scanning shall also be used to locate underground services before commencement of any mechanical excavation in the vicinity of underground services. These detection surveys shall be undertaken by the Contractor. ▪ Method Statements shall be developed for the construction phase by the Contractor to ensure that all underground services are located manually and carefully protected. The CEMP prepared by the Contractor and approved by the ER shall outline a methodology and procedure for carrying out such detection surveys ▪ An avoidance policy shall be adopted where possible in relation to all services and appropriate protection shall be provided for all above and below ground services as necessary.
Drainage and Water Supply Infrastructure	▪ The mitigation measures outlined for utilities will be repeated. ▪ All runoff from paved areas will pass through an oil/fuel interceptor to ensure that contaminated waters are not discharged into adjacent watercourses. ▪ A shut-off valve will be installed on the outlet of the attenuation tank. This will be used to contain any contaminated runoff in the event of a major accident on site.

4.11 Traffic Management

All construction activities will be governed by a construction Traffic Management Plan (TMP) the details of which will be agreed with FCC's Roads Department prior to the commencement of the Construction Phase. The principal objective of the TMP is to ensure that the impacts of all building activities generated during the Construction Phase upon both the public (off-site) and internal (on site) workers environments, are fully considered and proactively managed / programmed respecting key stakeholders' requirements.

During the construction works there will be additional HGV movements to/from the Site. Traffic will be generated by the disposal of surplus subsoil from the Site, deliveries of construction materials and equipment and of course private vehicles owned and driven by construction workers and staff.

It should be noted that construction traffic generated during the Construction Phase tends to be outside of peak hours. (Staff and deliveries arrive before 07:00 and generally depart after 19:00). The traffic generated by the construction phase will not be higher than the peak hour predicted volumes for the Operational Phase. Any specific recommendations/requirements with regard to construction traffic management made by FCC will be adhered to during this phase.

The following mitigation measures outlined in Table 4.11 below have been identified which will form part of a plan:

Table 4-11: Traffic Management Measures

Topic	Management Measure
Traffic Management Plan	A detailed Traffic Management Plan will be drafted in full consultation with Fingal County Council, An Garda Siochana, the Fire Service and the Ambulance service. The Traffic Management Plan will be developed by the Project Supervisor Construction Stage into a detailed contract specific Traffic Management Plan in full consultation with the same stakeholders
Abnormal Loads	An Application for an Abnormal Load Permit will be made to Fingal Co. Council in advance for any abnormal loads exceeding the thresholds laid out in the Road Traffic (Construction and Use of Vehicles) Regulations 2003. Where possible, abnormal load movements will be restricted to evening or night-time to minimise disruption to local traffic and traffic on strategic routes.
Haul routes	Dedicated construction haul routes will be identified and agreed with the local authority prior to the

Topic	Management Measure
	commencement of constructions activities onsite. The time of day permittable for such routes will also be agreed upon. Restrictions may be placed on the movement of construction related traffic if deemed necessary by Fingal County Council and/or an Garda Síochána.
Haul Vehicles	Haul vehicles must be covered after loading to ensure that there is no risk of material falling from the vehicle.
Equipment Management	Tracked excavators will be moved to and from the site on low-loaders and will not be permitted to drive on the street pavements.
Wheel Washes and Road Cleaning	Wheel washers / judder bars will be placed at all site access points to minimise the migration of detritus onto the public roads. The roads will be inspected and cleaned on a regular basis.
Staff Parking	Appropriate levels of staff parking and compounding will be provided to ensure no potential overflow or haphazard parking in the area. The Site will be able to accommodate employee and visitor parking throughout;
Site Traffic Management	▪ Once construction begins, 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 the Construction Phase. ▪ Provision of sufficient onsite parking and compounding to ensure no potential overflow of construction generated traffic onto the Retail Park. ▪ Site offices and compound will be located within the Site boundary. The Site will be able to accommodate employee and visitor parking throughout the construction period through the construction of temporary hardstanding areas. ▪ On completion of the works all construction materials, debris, temporary hardstands etc. from the Site compound will be removed offsite and the Site compound reinstated in full on completion of the works.

SECTION 5: OUTLINE WASTE MANAGEMENT PLAN

5.1 Introduction

This outline waste management plan relates to the management and disposal of waste generated associated with the Blackwood Square SHD. This outline waste management outlines the waste management framework and the key wastes that are likely to be generated on the project.

The Contractor is responsible for submitting the project waste management plan for the approval by the Employers Representative (ER) one month prior to construction. The plan must comply with this preliminary plan and the Department of Environment, Heritage and Local Government 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects' and will include the following (but not limited to):

- Specific/achievable waste management objectives;
- Analysis of waste arising; and
- Methods for proposed prevention, reuse and recycling of wastes.

5.2 Waste Management Principles

Management of all waste throughout the project lifecycle will be in accordance with EU, National and Regional waste management policy and the principles of the Waste Hierarchy i.e. prevention, minimization, reuse, recovery and recycling. In order to prevent and minimize the generation of wastes, the Contractor is required to ensure that raw materials are ordered in a timely manner so as the quantity delivered, and the storage does not lead to the creation of unnecessary waste.

5.2.1 Prevention of Waste

The management of material is key to implementing an effective waste prevention and minimization policy on site. Materials will be ordered in a timely manner and as required to avoid over ordering, excess supply and wastage. The Waste Management Plan shall provide for proper storage and handling of construction material to maximise usage and minimise waste. Materials delivered to site shall be inspected to ensure they are defect free and suitable for use.

5.2.2 Reuse of Waste

Where possible construction material will be reused on site/ off site. Material removed from site will be organised through an appropriately authorised waste collector removing to an authorised facility (licensed, permitted or registered as required).

5.2.3 Recycling of Waste

Segregation of waste streams shall be implemented on site to maximise recycling and recovery.

5.2.4 Disposal or further treatment of Waste

Segregation of waste streams shall also apply to waste streams (if found on-site) that may require specialist treatment, packaging or preparation prior to recovery or disposal e.g. Japanese knotweed, contaminated soil, asbestos, etc. The Contractor shall appoint a designated competent person for the preparation of additional paperwork and/or contact with appropriate officials and this shall be set out in the contract-specific Waste Management Plan.

5.2.5 Waste segregation, Storage and removal

The Contractor will ensure as much as possible that all recyclable material will be separated at source. Individual waste streams will be segregated through the use of separate bins, storage containers or clearly defined areas for stockpiling. Reusable and recyclable waste streams will be stored separately to residual wastes to avoid contamination and maximize their reuse potential.

Waste will be stored appropriately as follows:

- Clearly marked signs;
- Enclosed to prevent waste escaping;
- Segregated by type where possible;
- Suitable for that waste type, i.e. able to contain waste and prevent escape, including leaking of liquids;

5.2.6 Hazardous Wastes

Hazardous or contaminated material, including material that requires specialist treatment or disposal, will be stored separately on site to avoid cross-contamination. Hazardous wastes must not be mixed. Any hazardous waste generated (e.g. oil rags or waste oil) will be stored in appropriate receptacles or containers,bunded or other storage areas prior to their removal by an appropriately licensed contractor.

5.2.7 Waste Carriers/ Treatment Facilities

The materials to be disposed off-site classified as ‘wastes’ are subject to the provisions of the ‘Waste Management Act’, 1996 (as amended). Material removed from site will be organised through an appropriately authorised waste collector. Waste shall be brought by them to an authorised facility (licensed, permitted or registered as required). If waste is to be exported from Ireland, the Contractor will liaise with the client or its representative to arrange the necessary Transfrontier Shipment approvals through the Competent Authority.

The Contractor will ensure that:

- any waste carrier holds a valid waste collection permit;
- any disposal or recovery facility (national or international) be used for the management of waste arising from the scheme is suitably permitted, licensed or registered;
- the terms and conditions of these authorisations allow for the acceptance of the waste in question;
- the relevant authorisations remain valid when used within the lifetime of the project; and,
- all records are maintained and made available as set out below.

5.2.8 Storage, Transport and Disposal

The contractor will ensure as much as possible that all recyclable material will be separated at source. Individual waste streams will be segregated through the use of separate bins, storage containers or clearly defined areas for stockpiling. Reusable and recyclable waste streams will be stored separately to residual wastes to avoid contamination and maximize their reuse potential.

Hazardous material will be stored separately on site to avoid contamination Waste will be stored appropriately as follows:

- Clearly marked signs;
- Enclosed to prevent waste escaping;
- Segregated by type where possible;
- Suitable for that waste type, i.e. able to contain waste and prevent escape, including leaking of liquids;
- Hazardous wastes must not be mixed. Any hazardous waste generated (e.g. oil rags or waste oil) will be stored in appropriate receptacles or containers or in bunded storage areas prior to their removal by an appropriately licensed contractor.

The materials to be disposed off site are classified as 'wastes' and are subject to the provisions of the 'Waste Management Act' 1996 and amendments. Waste disposal will be to approved waste licensed landfill facilities or to licensed 'soil recovery' facilities.

The Contractor will ensure that:

- Any waste haulier employed is authorised by a waste collection permit;
- That any disposal or recovery facility to be used for the management of waste arising from the scheme is subject to an authorisation under the Waste Management Acts or other legislation;
- That the terms and conditions of these authorisations allow for the acceptance of the waste in question; and
- That these authorisations will not expire within the lifetime of the project.

5.3 By-Product - Excavated Soils

By making certain that excess uncontaminated soil and stone is beneficially used with no overall adverse impacts on the environment or human health, a material producer will ensure that the material is regarded as a by-product rather than a waste.

If the material is removed off-site for reuse as a by-product (and not as a waste), it will be done in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011. Article 27 requires that certain conditions are met and that by-product decisions are made to the EPA via their online notification form. Consequently, once a suitable project can be identified where the uncontaminated soil can be reused (infill for roads, quarry reinstatement etc) it is proposed to register the surplus soil as a by-product with the EPA.

As part of the registration with the EPA, the developer will demonstrate that the excavated soils meets the 4 by-product conditions,

a) further use of the soil and stone is certain;

b) the soil and stone can be used directly without any further processing other than normal industrial practice;

c) the soil and stone is produced as an integral part of a production process; and

d) further use is lawful in that the soil and stone fulfil all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

If EPA accepts the soils as a by-product the soils no longer constitutes a waste.

5.4 Imported Fill and Soils

If imported fill material is required, the use of local quarries or locally available material will be prioritised.

Alternatively, fill material (soils stone) from another site that has been registered as a by-product (and not a waste) in accordance with Article 27 of the Waste Directive Regulations. will be used if it is available. This will conform to the Waste Hierarchy and divert waste from landfill.

5.5 Waste Management Framework

5.5.1 Responsibilities

The Contractors Waste Manager will be responsible for ensuring that the Waste Management Plan is implemented. The Waste Manager may be the Environmental Manager or other suitability experienced

personnel. He/she is assigned the responsibility for waste minimization, reuse and recycling during all stages of this project.

All site personally have a responsibility to work towards the plan set out in the waste management plan.

5.5.2 Training

The Waste Management Plan will be made available to all personal on site. The Waste Management Plan and its objectives will be included in site induction for all staff members. Site induction will include instructions on how to comply with source segregations and material reuse.

Site notices will be positioned throughout the site to reinforce the Waste Management Plan.

5.5.3 Records

A record will be maintained of all waste removed from the site (Waste Removal Record Form in Appendix A). The record will include information on the date removed, EWC Code, description of area where waste arose, weight and volume, details of whether the waste in question was being removed for either disposal or recovery/recycling, waste transport contractor (including license or permit number), details of the facility to which waste is removed (including license or permit number).

A monthly summary of the include quantity, type and composition of all waste removed from site will be provided by the Contractor in the monthly Environmental Compliance Report.

A location will be identified where all records in regard to waste transport, recycling, disposal will be held for inspection by the ER or other third parties.

5.5.4 Inspections

The Environmental Manager will carry out weekly inspections of the site which will include examining how the waste is segregated. The weekly inspections will be documented on the Weekly Inspection Sheet (Appendix A).

5.5.5 Audits

Waste management will be audited as part of the auditing for the overall CEMP. Upon completions of the audit attention will be given to opportunities for reducing waste. Audit findings will highlight corrective actions that may be taken in relation to management policies or site practises in order to bring about further waste reductions.

All waste records (Waste Record Sheet, waste transfer notes etc.) will be audited externally by the ER .

5.6 Identification and Segregation of Waste

Wastes generated must be identified and segregated according to their category as described by the European Waste Catalogue (EWC).

The potential waste categories include but not limited to the wastes detailed in the following section.

5.6.1 Concrete, Bricks, tiles, ceramics (17 01)

Waste concrete is likely to arise during the construction phase. Where possible concrete will be returned to the supplier for reuse. In circumstances where this is not possible the concrete may be disposed off-site.

It's unlikely to have waste bricks, tiles or ceramic during the construction phase of this project. Unless they are found in excavated soil. However, careful storage is required to reduce the amount of breakages and waste being created. Offcuts/ trimmings will be re-used where possible. Any waste generated will be stored in containers to removal to a waste facility.

5.6.2 Wood, Glass and plastic (17 02)

Timber waste will be stored separately and re-used where possible. Remaining un-used timber will be disposed of at a recycling facility. Pallets will be returned to the supplier for reuse. A covered container for waste wood will be placed on site in convenient locations (Timber will not be allowed to rot.).

5.6.3 Bituminous mixtures, coal tar and tarred products (17 03)

Waste bituminous material may arise during the construction of internal site roads.

5.6.4 Metals (including their alloys) (17 04)

Metal waste can have a significant scrap value. Metals will be segregated on site for reuse and recycling.

5.6.5 Soil (including excavated soil from contaminated sites), stones and dredged spoil (17 05)

The SI sampling results indicate that the soil that will be excavated during the construction of the basement carpark will be inert. This will be sent to a suitably licenced facility for recovery/reuse. There are suitably licenced facilities with the capacity to accept the surplus soil within the Dublin Area. Note, that if the surplus soil is uncontaminated soil can be declared a by-product and subject to meeting certain conditions as set out in Article 5 of the 2008 Waste Framework Directive and Article 27 of the Waste Directive Regulations 2011 it is no longer considered a waste.

5.6.6 Insulation materials and asbestos-containing construction materials (17 06)

It's unlikely to find insulation material or asbestos-containing construction materials during this project. In the unlikely event that asbestos waste is encountered on-site appropriate storage, transportation and disposal of waste must be adhered to.

5.6.7 Packaging and Plastics (Various)

Packaging waste will be segregated at source and removed to a recycling facility. Waste packaging will be stored in separate covered containers.

5.6.8 Other wastes

Other wastes other than those listed above are usually non-recyclable. This material will be stored in a designated covered container for removal to a licensed facility for disposal.

5.7 Hazardous Material Management

In the unlikely event that hazardous waste is encountered appropriate storage, transportation and disposal of waste must be adhered to. A suitable qualified person will classify the material in accordance with European Waste Catalogue (EWC) and the Hazardous List. If non-hazardous waste becomes contaminated with hazardous waste the entire load will be considered hazardous.

The Contractor will ensure that appropriate measures are taken to safeguard the health of the Contractor's operatives and the general public for the duration of the works. In the event that hazardous materials are discovered on the site, the ER is to be informed immediately. The ER has the right to request that tests be carried out on any suspected hazardous materials to determine their exact nature.

Under certain circumstances, specialist contractors may be required to remove the hazardous materials from site e.g. asbestos. The Contractor will seek the approval of the Employer's Representative where the services of a Specialist Contractor are to be engaged. The Contractor will ensure that the Specialist Subcontractor, if any, will comply with all relative legislation regarding the required permits and licensing for the disposal of hazardous materials.

Hazardous materials arising from site clearance and/or excavations will be disposed of only at suitable licensed facilities

5.8 Other wastes requiring specialised management

Wastes other than those listed above may not be easily recovered. Such material should be stored separately or in a designated covered container for removal to a licensed facility for disposal.

In the event that materials such as contaminated soils are discovered, the Waste Manager shall engage with a specialist to gain appropriate authorisations, procurement approval from the Client, TFS approvals (if required) and will establish arrangements to provide for appropriate segregation, storage, collection and treatment. The Waste Manager will maintain records of all relevant correspondence and authorisations.

Rechargeable batteries should be used for portable devices where possible and any batteries or electrical equipment which may become redundant during the project should be stored separately prior to transfer to an appropriate WEEE facility.

Food waste management shall account for the need to align with health, safety and welfare at work guidelines to prevent rodent infestation.